POLIO AND THE POLITICS OF POLICY DIFFUSION IN LATIN AMERICA

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“A scientist who is also a human being cannot rest while knowledge which might reduce suffering rests on the shelf.”

--Dr. Albert B. Sabin
The world’s health ministers convened in Geneva for the World Health Assembly from May 21-26, 2012, and declared a global public health emergency, appealing to the countries of the world to respond to the threat of resurgent polio. Coincidentally, this historic declaration came fifty years to the day after the last case of polio was reported in Cuba on May 26, 1962, making Cuba only the second country in the world and the first in the Americas to successfully eradicate the dreaded disease. The Cuban strategy in 1962 was to mobilize volunteer armies to give the live oral polio vaccine (OPV) to children throughout the entire country twice a year on national immunization days (NIDs). Over the course of the next thirty years every country in Latin America adopted and implemented some variation of the original Cuban policy model, and in 1994 the Americas became the first region in the world to completely eliminate polio. The highly successful experience in Latin America was used as evidence to rally support for the Global Polio Eradication Initiative (GPEI) launched by the World Health Organization in 1988. The Americas seemed to have provided a simple blueprint for polio eradication that the rest of the world had only to follow in order to achieve the same dramatic results. However, as evidenced by the recent World Health Assembly declaration, the policy innovations that were adopted and implemented so successfully in the Region of the Americas have been far less effective when simply exported to other countries and other regions of the world. The persistent failure of both domestic governments and the GPEI itself has highlighted longstanding problems linked to the dissemination and diffusion of evidence and new public health innovations, and the “translation
gaps” that prevent existing evidence-based interventions from being effectively implemented in different countries and sustained over time.

This dissertation, *Polio and the Politics of Policy Diffusion in Latin America*, contributes to global health policy scholarship by providing the first comprehensive history of the domestic Latin American initiatives that preceded the regional polio eradication campaign in the Americas, after which both regional and global campaigns were modeled. In addition, my dissertation contributes to policy diffusion and implementation research. At its core, the history of polio eradication in the Americas is a history of how new ideas and innovations linked to polio and immunization strategies were circulated among actors in different countries, and what different actors did with new information and innovations once they became available. This history provides an opportunity to examine why new innovations and ideas were more effectively implemented in some countries than others and how interactions between domestic and external factors made it possible to overcome “translations gaps” hindering effective policy implementation at different points in time.
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Writing a dissertation is not for the faint of heart. It is also not something I could have done without the incredible team I was fortunate to have supporting me throughout the process. My family, both the one I was born into and the one I was lucky to become part of during graduate school, made my doctoral studies, and even writing my dissertation, a fantastic experience.

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CHAPTER 1
INTRODUCTION

The world’s health ministers convened in Geneva for the World Health Assembly from May 21-26, 2012, and declared a global public health emergency, appealing to the countries of the world to respond to the threat of resurgent polio. Coincidentally, this historic declaration came fifty years to the day after the last case of polio was reported in Cuba on May 26, 1962, making Cuba only the second country in the world and the first in the Americas to successfully eradicate the dreaded disease. The Cuban strategy in 1962 was to mobilize volunteer armies to give the live oral polio vaccine (OPV) to children throughout the entire country twice a year on national immunization days (NIDs). Over the course of the next thirty years every country in Latin America adopted and implemented some variation of the original Cuban policy model, and in 1994 the Americas became the first region in the world to completely eliminate polio. The highly successful experience in Latin America was used as evidence to rally support for the Global Polio Eradication Initiative (GPEI) launched by the World Health Organization in 1988. The Americas seemed to have provided a simple blueprint for polio eradication that the rest of the world had only to follow in order to achieve the same dramatic results.

However, as evidenced by the recent World Health Assembly declaration, the policy innovations that were adopted and implemented so successfully in the region of the Americas have been far less effective when simply exported to other countries and other regions of the world. The persistent failure of both domestic governments and the GPEI itself has highlighted longstanding problems linked to the dissemination and diffusion of evidence and new public health innovations, and the “translation gaps” that prevent existing evidence-based interventions from being effectively implemented in different countries and sustained over time.

1 Czechoslovakia was the first country to eliminate polio in 1961.
My dissertation, *Polio and the Politics of Policy Diffusion in Latin America*, will contribute to global health policy scholarship by providing the first comprehensive history of the domestic Latin American initiatives that preceded the regional polio eradication campaign in the Americas, after which both regional and global campaigns were modeled. In addition, my dissertation will make a contribution to policy diffusion and implementation research. At its core, the history of polio eradication in the Americas is a history of how new ideas and innovations linked to polio and immunization strategies were circulated among actors in different countries, and what different actors did with new information and innovations once they became available. This history provides an opportunity to examine why new innovations and ideas were more effectively implemented in some countries than others and how interactions between domestic and external factors made it possible to overcome “translations gaps” hindering effective policy implementation at different points in time.

The majority of Latin American countries were not successful in early attempts to implement immunization campaigns. It took several different implementation attempts throughout the 1960s and 1970s for every country but Cuba to control polio. A primary contribution of this dissertation is that it examines how previous implementation experiences influenced subsequent efforts to control polio, and how translation gaps were bridged more effectively over time in every country throughout the region to successfully eliminate polio by 1994. I use a paired case study of Brazil and Mexico at three different points in time between the early 1960s and the early 1990s, to examine how domestic immunization initiatives in each country developed, and became much more effective, over time. In order to address “translation gaps” in the field of public health, we need to address gaps in the existing policy diffusion literature as well. These gaps are briefly outlined below.
Diffusion research within the field of international relations is heavily focused on top-down diffusion models where policies or ideas are generated by and diffuse from more advanced or industrialized countries and powerful international organizations, down to less developed countries. There is very little research that addresses the less studied diffusion patterns whereby policies and ideas diffuse from one peripheral country to another in a South-South transfer of ideas, information, technology, and expertise.² My dissertation uses the development of the regional polio eradication initiative in the Americas to examine South-South innovation diffusion patterns and the possible variations in domestic policy outcomes that may emerge as a result.

In addition to looking at how innovations diffuse, the direction of diffusion, and the role of actors within the innovation-diffusion process, this dissertation challenges the bias within diffusion research that focuses almost entirely on the adoption phase of the policy process. Everett Rogers explains that diffusion scholars rely heavily on “variance research” or quantitative methods to study innovation diffusion, generating statistical models to explain why some countries adopt more quickly than others or to identify factors that influence the likelihood of adoption for a given unit at a specific point in time. For example, studies have found that the rate of new vaccine adoption for a given country is highly correlated with the number of neighboring countries who have adopted the same vaccine.³ However, these statistical explanations are necessarily limited in a number of ways that make them less useful for improving actual outcomes resulting from policy adoption. Since the adoption phase is often the most visible or concrete, it is frequently the easiest to quantify making the adoption phase the phase of choice for most diffusion scholars. A basic quantitative analysis explaining the adoption

² For a notable exception to this trend see, Kurt Weyland, Bounded Rationality and Policy Diffusion: Social Sector Reform in Latin America (Princeton University Press, 2006).
of the oral polio vaccine in the Americas using cross-sectional data from 1959-1961, would find that virtually every country in Latin America was in the “early adopter” category, having all made the decision to adopt the innovation at roughly the same time.

However, while diffusion is often characterized as the spread of “similarity amidst diversity,” this narrow focus on the adoption phase of the diffusion process overlooks the spread of what could be described as “diversity in spite of similarity” -- that is, the significant variation in policy adaptation and implementation that takes place after a country has adopted a given innovation. My dissertation examines how interactions between domestic and external factors contribute to this variation, identifying the conditions under which diversity occurs in spite of similarity.

Finally, in expanding the focus of my inquiry beyond the adoption phase of the policy process, my dissertation examines the longer-term effects of diffusion processes, such as the spillovers or institutional legacies (both positive and negative) produced by the adoption of specific policies and their subsequent implementation, and the ways in which both domestic and international factors contribute to these effects. The historical scope of the dissertation and the extended time-frame covered makes it possible to do the sort of process research that spans the entire innovation-decision process, as opposed to a single phase during a single snapshot in time. In contrast to more contemporary analyses of recent or ongoing health initiatives, the novelty of this dissertation lies in the fact that the innovation-decision process concerning polio immunization and eradication has already taken place in every country in the Americas. As a result, this dissertation is able to evaluate the entire policy process in different countries, as well as examine both immediate and more long-term consequences or institutional legacies.
This dissertation uses the development of polio and related immunization programs in the region of the Americas between 1955 and 1995 to examine four interrelated research questions: (1) What are the causal mechanisms that help explain the cross-national diffusion of public health policies, especially those related to vaccine preventable diseases?; (2) Do different diffusion patterns (hierarchical/top-down versus South-South/spatial) help explain variations in policy adaptation and implementation?; (3) How do contextual differences (including interactions between domestic and external factors) help explain variations in policy adaptation and implementation?; (4) What are the longer-term effects on health systems of policies produced by diffusion, and do these effects vary depending on the policy variations identified above?

Literature Review

Explaining the How and Why of Diffusion

Research Question # 1: *What are the causal mechanisms that help explain the cross-national diffusion of public health policies, especially those related to vaccine preventable diseases?*

In their seminal 1975 work, Collier and Messick used the adoption of social security policies in 59 countries to examine the explanatory power of two alternative frameworks focused on “internal determinants” or “prerequisites” and “diffusion.” The prerequisites explanation focused on the determinants of adoption *within* countries such as levels of economic

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development or “modernization.” Alternatively, diffusion explanations centered on the “imitation of social security programs among nations.”

Drawing on Collier and Messick and other scholars such as Kurt Weyland, my dissertation uses the cross-national diffusion of polio vaccines and immunization policies throughout the Americas starting in 1955 (when the first polio vaccine was introduced), to identify the different causal mechanisms driving these diffusion processes examining both “prerequisites” and diffusion mechanisms. Prerequisites in this case would include factors like the disease burden associated with polio demonstrating a need for the vaccine, existing resources available for immunization programs in a given country, domestic actors or groups advocating for the adoption of the vaccine and/or immunization, existing health system capacity, and public health precedent related to immunization.

My examination of possible diffusion explanations includes several factors. The first is the role of international organizations and the policies or interventions favored by the global health community at different points in time. Specifically, I examine the different mechanisms through which the Pan American Health Organization (PAHO), influenced (or sought to influence) domestic adoption decisions related to polio immunization starting in the mid-1950s. A second category of external factors is drawn from more contemporary International Relations scholarship on diffusion. Popular explanations for diffusion within the field of International Relations include socialization mechanisms focused on the international diffusion of social norms, as well as explanations focused on “power, coercion, and incentive manipulation.”

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5 Ibid., 1299.
Throughout the course of my dissertation I examine the extent to which these common explanations focusing on norm diffusion and the role of power and incentive manipulation, help explain the cross-national diffusion of vaccines and immunization initiatives linked to polio during a forty-year time period between 1955 and 1995. In contrast to these more top-down or hierarchical explanations, my dissertation proposes a more interactive process of diffusion focused on knowledge exchange and the effects of policy learning (discussed below).

My dissertation has been heavily influenced by a small but growing interdisciplinary community of scholars using public health history and the development of social policies in Latin America and the Caribbean to critically reexamine interactions between developing countries and more industrialized nations, along with the international organizations and institutions they frequently dominate. This movement includes scholars such as Gilberto Hochman, Marcos Cueto, Steven Palmer, Anne-Emanuelle Birn, and Kurt Weyland. There are several common threads linking the work being done by these scholars. The first commonality is that they all challenge assumptions of unidirectional transfers and impositions of knowledge or policy models from north to south, and instead explain domestic policy developments in less industrialized countries (both past and present) as being the product of dynamic interactions between domestic and external factors and actors. The second is their emphasis on different knowledge exchange or “learning” mechanisms and domestic communities of experts as explanations for policy development, with actors in different countries learning both from external models as well as their own domestic experiences and public health precedents.

Latin American public health historian Marcos Cueto who is among the leaders of this emerging scholarly community, explains, “The transfer of Western Science has not been a one-way street, instead authority has been negotiated and accommodated by recipients who have
frequently redefined the content of ideas and the shape of imported institutions.”7 Steven Palmer, another central figure in the field, uses the term “peripheral precedence” to explain the largely overlooked aspect of public health history whereby actors in developing countries are active producers rather than just consumers of medical and scientific expertise. Palmer challenges assumptions held by many public health scholars that domestic policies in developing countries were modeled after or based on foreign (Western) examples and expertise.8 Palmer argues that there is an overemphasis in contemporary scholarship on “disease, medicine, and empire” and on the “dramatic imposition of an alien medical model” which is very frequently far from the reality.9

In my dissertation, I examine a series of possible causes of policy change and evolution over time drawing on the work of policy scholars such as Everett Rogers, Hugh Heclo, Richard Rose, Peter Hall, Kurt Weyland, and others who explain policy change as an ongoing and cyclical process through which actors learn from previous experiences (both successes and failures and both their own and those of others). Throughout the course of my dissertation I draw on more contemporary scholarship concerning policy and program evaluation to examine how these evaluations (both formal and informal) influence changes in policy and implementation strategies. Howlett et al. explain that policy evaluation is “the stage of the policy process at which it is determined how a public policy has actually fared in action.”10 The authors go on to suggest that, “perhaps the greatest benefits of policy evaluation are not the direct results it generates in terms of definitive assessments of the success and failure of particular policies per

9 Ibid., 313.
se, but rather the educational dynamic that it can stimulate among policy-makers as well as others less directly involve in policy issues.” According to Howlett et al. policy evaluation can lead to “policy learning” which they describe an “endogenous change-enhancing process.” Drawing on Heclo’s 1974 work, Howlett et al. explain policy learning as when “a relatively enduring alteration in policy results from policy-makers and participants learning from their own and others’ experience with similar policies.”

The authors note that there are a range of different types of learning with a similarly diverse range of consequences; however, they write that all types of learning “involve the development and diffusion of new ideas into existing policy processes.” An additional contribution of my dissertation is that it not only examines the influence of policy learning on domestic policy processes and institutional development, but it also examines how policy evaluation and policy learning influenced the development of supranational policies and institutions using the Pan American Health Organization and its immunization programs and related technical cooperation as a sort of supranational case study.

Who is Learning from Whom and Does This Matter?

Research Question #2: Do different diffusion patterns (hierarchical/top-down versus South-South/spatial) help explain variations in policy adoption, adaptation and implementation?

Innovation diffusion research has tended to be heavily focused on top-down or more hierarchical diffusion models where policies or ideas diffuse from more advanced or industrialized countries.

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11 Ibid., 179.
12 Ibid., 206.
13 Ibid.
14 Ibid.
and powerful international organizations, down to less developed countries.\textsuperscript{15} Everett Rogers confirms that, “For decades, the classical diffusion model dominated the thinking of scholars, policy makers, and change agencies.”\textsuperscript{16} Rogers explains that in this classical model, “an innovation originates from some expert source (often an R&D organization). This source then diffuses the innovation as a package to potential adopters who accept or reject the innovation. The individual adopter of the innovation is a passive accepter.”\textsuperscript{17} In these centralized top-down diffusion systems technical subject matter experts control decision-making concerning which innovations should be diffused, when innovations are ready for diffusion, what diffusion channels should be used, and who innovations should be diffused to. According to Rogers, “Diffusion in centralized systems flows from the top down, from experts to users.”\textsuperscript{18}

Rogers writes that over the course of his career he became increasingly “aware of diffusion systems that did not operate at all like centralized diffusion systems.”\textsuperscript{19} Instead, Rogers proposed that in some diffusion systems innovations often “bubbled up” from multiple sources and from experiences at the “operational levels of a system” and were then “spread horizontally via peer networks, with a high degree of re-invention occurring as the innovations are modified by users to fit their particular conditions.”\textsuperscript{20} Rogers explains that decision-making within decentralized diffusion systems is usually widely shared by members (users) of the system instead of being driven by technical experts, with potential adopters who are also users, making key decisions.\textsuperscript{21}

\textsuperscript{15} Martha Finnemore, \textit{National Interests in International Society} (Cornell University Press, 1996); Finnemore and Sikkink, "International Norm Dynamics and Political Change; Simmons, Dobbin, and Garrett, "The Global Diffusion of Public Policies: Social Construction, Coercion, Competition, or Learning?."

\textsuperscript{16} Everett Rogers, \textit{Diffusion of Innovations}, 5th ed. (2003), 394.

\textsuperscript{17} Ibid., 394-95.

\textsuperscript{18} Ibid., 401.

\textsuperscript{19} Ibid., 395.

\textsuperscript{20} Ibid.

\textsuperscript{21} Ibid.
According to Rogers there are several basic differences between decentralized and centralized ideal-types. The differences that are most relevant to this dissertation and discussed below include: (1) the sources and origins of innovations; (2) the direction of diffusion (top-down vs. more horizontal or south-south), and associated diffusion mechanisms; (3) the importance of user-needs in the diffusion process; (4) the amount of reinvention that occurs throughout the diffusion process.

One of the fundamental differences between decentralized and centralized systems concerns the origins and sources of innovations. Scholars engaged in comparative historical analysis and proponents of path dependency argue that the timing and sequencing of events and the influence of previous decisions that preceded the primary decision of interest (the decision to adopt a specific innovation) cannot be ignored. Rogers similarly argues that:

“relevant activities and decisions usually occurred long before the diffusion process began: A perceived problem, funding decisions about R&D activities that led to research work, invention of the innovation and then its development and commercialization, a decision that it should be diffused, transfer of the innovation to a diffusion agency, and its communication to an audience of potential adopters.”

Rogers argues that these “relevant activities and decisions” taking place during the innovation-development process “have a strong influence on the diffusion process.”

This dissertation examines the innovation-development processes linked to polio vaccines and immunization innovations, and the ways in which “relevant activities and events” during innovation-development processes influenced the subsequent diffusion of polio vaccines and immunization strategies in the Americas starting in the mid-1950s. I use a series of country case studies at three different points in time between the mid-1950s through the early 1990s, to examine how the origins of innovations, specifically whether or not innovations were developed

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23 Ibid., KL2645-46.
so as to address domestic conditions and needs of Latin American countries, influenced adoption
decisions and the way in which adopted policies were implemented in different countries.

A second key difference between the decentralized and centralized diffusion systems
outlined by Everett Rogers and the center-periphery model discussed by Donald Schön concerns
the amount of reinvention that occurs for a given innovation during the innovation diffusion
process. In his “center periphery model” Schön writes that the assumption is that the innovation
to be diffused already exists in its final and/or supposedly optimal form at the time of diffusion.\textsuperscript{24}
Similarly, Rogers explains that in a centralized system there is minimal reinvention and
adaptation during the innovation diffusion process, in contrast to decentralized systems that are
characterized by a high degree of reinvention as the innovation diffuses among members of the
system. Rogers defines reinvention as “the degree to which an innovation is changed or modified
by a user in the process of its adoption and implementation.”\textsuperscript{25}

Reinvention that still maintains the core elements of an innovation can have numerous
advantages. For example, Rogers proposes that the degree of reinvention is associated with both
the rate of innovation adoption and the degree of sustainability of an innovation.\textsuperscript{26} Innovations
that can be effectively reinvented or adapted by adopters without compromising the performance
of the innovation are arguably more likely to suit the conditions and needs of adopters and
facilitate more effective implementation as well. Rogers writes that, “Re-invention can be
encouraged if inventions are designed with the possibility of re-invention in mind.”\textsuperscript{27}

Reinvention and adaptation are sometimes viewed as being at odds with notions of
implementation fidelity. Implementation fidelity refers to the extent to which a program or model

\textsuperscript{24} Donald Schön, \textit{Beyond the Stable State} (New York: Random House, 1971), 161.
\textsuperscript{25} Rogers, \textit{Diffusion of Innovations}, KL3425-28.
\textsuperscript{26} Rogers, \textit{Diffusion of Innovations}, 183.
\textsuperscript{27} Ibid., 181.
is implemented according to the guidelines established by the program’s developers as part of the original model. Castro et al. suggest this “fidelity-adaptation” tension involves two competing objectives: (1) developing “universal prevention interventions” and implementing them with fidelity; and, (2) designing prevention interventions that are suited to match the needs and contexts of potential adopters and adopting communities.28

A solution to this proposed tension comes from James Dearing. Dearing proposes the idea of “guided adaptation” that involves, “explicating the underlying causal components of a program as well as examples for operationalizing those causal components in practice, and clarifying to implementers which aspects of a demonstrated program are central to its observed effect and which components are peripheral and more likely changeable without deleterious effects.”29 This dissertation (specifically in chapters five and six) examines the ways in which both international organizations such as PAHO and national ministries of health, developed the capacity to facilitate this sort of “guided adaptation” and thereby facilitated more effective national and subnational adaptation, implementation, and institutionalization of immunization programs.

Kurt Weyland’s work on contemporary social policy diffusion in Latin America is in line with Rogers’ discussion of more decentralized diffusion systems and also addresses issues concerning the adaptation of external policy models as part of the innovation diffusion process. In his exceptional book *Bounded Rationality and Policy Diffusion: Social Sector Reform in Latin America*, Weyland examines the relative weight of external actors and top-down influences compared to domestic needs, national actors and domestic communities of experts in shaping

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domestic social policy adoption and implementation decisions.\textsuperscript{30} One of the most significant contributions of Weyland’s study is the range of evidence he provides to challenge assumptions about the influence of powerful international organizations such as the World Bank relative to domestic actors in developing countries.

Ultimately, Weyland found that while international actors and external pressures did influence domestic policy processes in various ways, they were in no way deterministic. Instead, Weyland writes that a “distinctly bounded form of rationality” explains cross-national social policy diffusion, with domestic policymakers drawing heavily from “certain foreign experiences” for largely “logically arbitrary reasons, including geographic and temporal proximity.”\textsuperscript{31} Based on his findings, Weyland suggests that more attention should be paid to the role of “comparative decision making”, suggesting that the observation of promising policy alternatives adopted by neighboring countries (“neighborhood effects”) may play a significant role in explaining policy diffusion and policy changes in the Americas.\textsuperscript{32}

Building on the work of scholars like Rogers and Weyland, this dissertation helps to fill the knowledge gap that exists in terms of our understandings of decentralized and centralized diffusion models by examining the extent to which the different ideal-types help explain the empirical reality on the ground throughout my case studies from the Americas. I do this by examining the key characteristics of both models proposed by Rogers, as they relate to polio vaccine diffusion and the diffusion of immunization strategies in the Americas over time.

\textsuperscript{31} Ibid., KL223.
\textsuperscript{32} Ibid., 131.
Research Question #3: How do contextual differences (including interactions between domestic and external factors) help explain variations in policy adaptation and implementation?

When their article first appeared in 1975, Collier and Messick argued that the prerequisite and diffusion frameworks examined in their study received unequal scholarly attention. The authors suggested a significant bias in favor of prerequisite explanations and insufficient attention paid to diffusion explanations or possible combinations of the two frameworks. Within the field of International Relations and Comparative Politics to a lesser extent, the bias in much contemporary scholarship appears to have skewed to the other extreme with many explanations for the cross-national spread of social policies or innovations focusing almost entirely on external factors and influences (diffusionist explanations). Domestic factors and conditions are frequently overlooked and, when they are included, are included primarily as minor obstacles to the diffusion of social policies rather than possible drivers of it.

Drawing on the work of Everett Rogers, I argue that this bias is in part due to the tendency within contemporary diffusion research to focus on what Rogers refers to as “the left-hand tail of the S-shaped diffusion curve,” that is the adoption phase of the innovation diffusion process with an emphasis placed on the first adoption of a given policy or innovation. Existing innovation diffusion studies have produced an extensive amount of information concerning the factors that influence the likelihood or pace of adoption for new innovations. There has been a significant increase in these kinds of time-to-adoption studies within the public health literature focused on the adoption of new public health interventions such as vaccines. However, there are

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myriad examples from countries all over the world where innovations have been formally adopted by national authorities but not implemented effectively, scaled-up to cover the entire target population, or institutionalized. Put very simply, innovation adoption is necessary but not sufficient to produce desired improvements in health outcomes.

Within the expanding field of diffusion studies there has still been much less attention paid to what happens before and after an innovation adoption decision has been made. Rogers critiques this scholarly myopia and argues that, “diffusion is but one phase of the larger sequence through which an innovation goes from the decision to begin research on a recognized problem to the consequences of the innovation.”\textsuperscript{36} The adoption phase of the policy process and concrete outcomes such as immunization coverage are easier to observe and measure as compared to the adaptation and implementation phases that most frequently involve a series of complex processes that unfold over time. As a result, there is a considerable gap in the existing research concerning multiple adoptions of a given policy (that is adoption followed by abandonment and re-adoption at a later point in time), the adaptation or re-invention of innovations by adopters over time, the extent to which innovations are effectively implemented and institutionalized (if they are implemented at all), and the range of consequences associated with adoption, adaptation, and implementation of a given innovation.\textsuperscript{37} Moreover, there is a gap in the existing research concerning the relative influence of internal determinants versus diffusion explanations in shaping these processes and associated outcomes.

My dissertation seeks to place prerequisite or internal determinants models and diffusion explanations on more equal footing, in part by extending my inquiry beyond the initial adoption of a given policy to focus also on the stages of the policy process that unfold after an adoption

\textsuperscript{36} Ibid.
decision has taken place. I argue that external factors or diffusion explanations are more useful for explaining the first formal adoption of a specific policy rather than its subsequent adaptation, implementation, and institutionalization over time in a given country.

Throughout the course of my dissertation I argue that while diffusion is often characterized as the spread of “similarity amidst diversity,” the narrow focus on the adoption phase of diffusion processes and the tendency to view adoption as a dichotomous variable (adopt or reject) overlooks the spread of what could be described as “diversity in spite of similarity” that is, the significant variation in policy adaptation and implementation that takes place after a country has adopted a given policy and the range of consequences produced as a result. I argue that this diversity in spite of similarity is largely the result of diversity of internal determinants or domestic contexts within which new policies are operationalized. The context within which diffusion and processes of change occur can have enormous influence on the actual affects the policy has on the population, the extent to which policy changes are ephemeral or enduring, and the emergence of potential “gaps” between formal institutional intentions and actual implementation or enforcement. This dissertation builds on the work of scholars like Falleti and Lynch and George and Bennett who argue that causal mechanisms “operate only under certain conditions” and the influence these mechanisms have on outcomes (policy change within the context of this dissertation) is dependent upon their interactions with the context in which they

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operate, “In other words, a causal mechanism may be necessary, but not sufficient, in an explanation.”\(^{40}\)

Scholars such as Steven Palmer and Gilberto Hochman have championed the importance of domestic contexts and interactions between internal determinants and diffusion explanations in their work on the development of public health policies and programs in the Americas. In his superior multi-country study of Rockefeller Foundation (RF) International Health Division (IHD) hookworm programs in six countries in Latin America and the Caribbean in the early 1900s, Palmer demonstrates significant cross-national variation in how IHD programs were adapted and implemented across his case studies. Diverse outcomes occurred in spite of the fact that hookworm campaigns were institutionally identical, deployed during the same time period in all six countries, and deployed in different countries within the same region.

Palmer argues that the “form and fate” of RF missions was “more a product of local historical dynamics than of RF public health science being applied from above.”\(^{41}\) Palmer explains that RF missions were enabled by preexisting interests among domestic actors and communities of experts in addition to local domestic capacity. Palmer writes that, “Global health then, came to roost in areas where the local terrain had already been prepared, local populations already primed to varying degrees, and medical and technical experts already trained to interpret and reinterpret the will of these new medical pilgrims.”\(^{42}\) According to Palmer, “RF philanthropy did not intervene or impose an alien project on these polities,” instead it played a crucial though not definitive role in domestic program development by providing “fiscal and methodological

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\(^{42}\) Ibid., 10.
stability” to processes at least partially already underway. In other words, RF diffusion mechanisms, according to Palmer, were highly context-dependent and the variation identified by Palmer in his six-nation study was the result of interactions between contexts and causal mechanisms.

My dissertation builds on the work of the aforementioned scholars using the development of polio immunization initiatives in the Americas to examine how changes in contexts (both domestic and international) affected policy adoption and implementation at different points in time. I begin by examining early polio immunization initiatives adopted by Latin American public health officials in the early 1960s, when the polio vaccines became more widely available in the region. I use examples from Brazil and Mexico to highlight the different ways in which domestic context and antecedent conditions influenced (and constrained) domestic implementation attempts throughout the 1960s and early 1970s. I examine these case studies in chapters three and four along with several significant domestic capacity building initiatives that took place during the 1960s and early 1970s in collaboration between Latin American countries and the Pan American Health Organization (PAHO). I then compare (in chapter six) the period in the 1960s and early 1970s to the polio immunization initiatives carried out in the Region starting in the early 1980s to demonstrate the effects that changing context and domestic capacity had on policy implementation.

Implementation and Institutional Legacies

Research Question #4: What are the longer-term effects of policies produced by diffusion and do those effects vary depending on the variations identified above?

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43 Ibid.
44 Falleti and Lynch, "Context and Causal Mechanisms in Political Analysis."
To examine the fourth and final question of my dissertation I return to Everett Rogers who asks, “Where do innovations come from? How do their origins later influence their diffusion and consequences?” Rogers suggests that the diffusion process and its consequences are frequently “determined in part” during early stages in the innovation development process. Rogers writes that:

“Past diffusion investigations overlooked the fact that relevant activities and decisions usually occurred long before the diffusion process began: a perceived problem, funding decisions about R&D activities that led to research work, invention of the innovation and then its development and commercialization, a decision that it should be diffused, transfer of the innovation to a diffusion agency, and its communication to an audience of potential adopters. Then the first adoption of the innovation occurs, and the diffusion process begins.”

Rogers defines “consequences” as, “the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation.” Rogers suggests that the scarcity of studies on consequences is in part because consequences are difficult to measure and are often “confounded with other effects,” and therefore are most effectively examined through observations of complex process that unfold over time, or through in-depth case studies. One of the primary contributions of this dissertation is that it does both.

This dissertation systematically observes the ways in which complex processes unfold over time at both regional and national levels, tracing the entire life cycle of polio initiatives in the Americas from the initial development of polio vaccines in the 1950s, to the total elimination of polio in Latin America certified by the WHO in 1994. The extended time frame covered within this dissertation and the fact that it relies on historical analysis of a series of complex processes that have already come to a conclusion in the region as a whole, make it possible to

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46 Ibid., 159.
47 Ibid., 137.
extend the scope of my research one step further to examine the various consequences associated with this innovation diffusion process. Additionally, the use of both within-case and cross-case comparisons of two countries at three different points in time, makes it possible to examine how variations in domestic antecedent conditions and contexts, were related to cross-national variations in institutional legacies.
Key Independent Variables

*Geoepidemiology*

In his book *Contagion and the State*, public health historian Peter Baldwin introduces the concept of “geoepidemiology” to explain policy variation among European nations responding to contagious diseases such as cholera in the 1830s. Under this umbrella term Baldwin includes factors such as: Where a country was located in the path of a particular epidemic that influenced their potential to learn from the experiences of other earlier hit countries; ease of communication and information exchange between countries; basic topographical features that make quarantine more feasible for some countries than others (islands as opposed to interior territories); migration patterns making some countries more likely destinations for migrants increasing risk of visitors as vectors; proximity to the source of outbreaks (countries closer to the “Orient” were deemed more vulnerable to cholera); shared borders. A qualifier on Baldwin’s concept is that the geoepidemiological effect is by no means fixed. It should be expected to change over time and be more or less significant or perhaps significant in different ways depending on factors such as changes in disease distribution, availability of interventions to combat the disease, and progress (or a lack thereof) made in other nearby countries. Additionally, the salience of geoepidemiology can be expected to change over time as transportation and communication developments have made human and microbial mobility easier and made it possible for people and pathogens to travel more quickly.

I expect geoepidemiological factors to be more significant in Mexico than Brazil during the earlier implementation episodes examined in chapters two and three. During the 1940s and

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1950s the United States was not only the focal point for polio epidemics in the Western Hemisphere, it was also the hub of polio and vaccine related research in the region. With 2,000 miles of shared (and easily crossable) borders between Mexico and the United States, polio epidemics in either country posed a direct and very real threat to both countries. As will be seen in chapters two and three, Mexico’s proximity to the United States not only upped the risk of polio importations in Mexico, it also significantly increased the access Mexican researchers and public health officials had to polio vaccine research being conducted in the United States. In contrast, during the 1950s, travel between the United States and Brazil was slow, costly, and relatively rare. While Brazil was at risk of polio outbreaks in neighboring countries, the combined polio incidence in all of Brazil’s ten border-sharing neighbors, paled in comparison to polio incidence in Mexico’s neighbor to the North. I expect that geoepidemiology played a more significant role in Brazil starting in the 1970s and throughout the 1980s. As several of Brazil’s neighbors made progress in combating polio within their own borders, the persistence of polio in Brazil became increasingly problematic as imported cases of polio from Brazil were reported in countries like Argentina and Uruguay. During the 1980s, geoepidemiological factors also facilitated opportunities for multi-country policy interventions and cross-national learning between Brazil and its neighbors, which were influential in the finals stages of the regional polio eradication campaign discussed in chapter six.

**Stewardship**

In the year 2000 the World Health Organization adopted a resolution that included “stewardship” as one of the four “essential functions” of the health system along with service provision, resource generation, and financing. Dr. Gro Harlem Brundtland, the Director General of the
WHO explained stewardship as, “setting and enforcing the rules of the game and providing strategic direction for all the different actors involved.”\(^{50}\) According to the 2000 report, “Stewardship encompasses the tasks of defining the vision and direction of health policy, exerting influence through regulation and advocacy, and collecting and using information.”\(^{51}\) The report continues to highlight the special role of stewardship in that it involves “oversight of all the other functions” that together, comprise a health system.\(^{52}\) The WHO explains, “It [stewardship] requires vision, intelligence and influence, primarily by the health ministry, which must oversee and guide the working and development of the nation’s health actions on the government’s behalf.”\(^{53}\)

Using the WHO’s basic concept of stewardship, I define stewardship within this dissertation to encompass a range of centralized functions provided largely by national government institutions, including, but not limited to, the Ministry of Health. The core elements of stewardship outlined by the WHO, and that I examine within my dissertation, include the following: (1) formulating health policy - defining the vision and direction of national policies; establishing priorities and expected roles and responsibilities of different actors and institutions involved; providing general policy frameworks and guidelines; (2) regulation and oversight - includes establishing rules to “govern the behavior of different actors involved in the health system, and ensuring compliance with them”; (3) collecting and using intelligence - encompasses generating, collecting, and disseminating a wide range of information such as disease surveillance data, evidence from operational research, policy evaluation, and information on innovations or experiences in other countries that can be adapted to suit local conditions.

\(^{51}\) Ibid., xiv.
\(^{52}\) Ibid., 24.
\(^{53}\) Ibid., 119.
I include the concept of stewardship to help explain cross-national variation in how immunization policies were developed and implemented in Brazil and Mexico at the same points in time. Additionally, I use within-country comparisons in each country at three different points in time, to examine how longitudinal changes in specific aspects of stewardship, help explain different outcomes related to polio immunization policy adaptation, implementation, and institutionalization.

One of the key aspects of stewardship that I examine within this dissertation concerns “collecting and using intelligence” to facilitate the adaptive capacity of health systems – i.e., the capacity of domestic actors and institutions to adapt external policy models or previous domestic policies, to better suit domestic conditions and enable more effective policy implementation. I expect that as adaptive capacity within the health sector increases in different countries, so too does cross-national diversity in terms of the ways in which programs are implemented. This assumption is based on the work of scholars such as Kurt Weyland who have found that in adopting social security policies and health system reforms, countries with stronger domestic communities of experts and greater access to information, were more likely and able to adapt foreign policy models to better suit domestic conditions. Based on this and going back to Rogers, I expect that the adaptive capacity of domestic actors and institutions is positively associated with effective policy implementation and sustainability or institutionalization.

I expect that administrative instability within national ministries of health and related institutions, negatively influences stewardship within the health sector. The case studies in this dissertation demonstrate that administrative instability makes it more difficult to establish continuity within specific programs, complicates the development of longer-term plans or priorities, and often disrupts the institutionalization of policies or programs. However, my
research indicates that in some cases the role of external actors and organizations can be influential in mitigating the deleterious effects of political and administrative instability by providing a source of continuity within specific policy arenas. For example, in 1964 a military coup in Brazil resulted in extreme administrative instability within the Ministry of Health disrupting polio immunization initiatives. In response, PAHO sent a full-time consultant to help provide stability within the public health laboratory that had been providing the research support for the initiative prior to the coup.

Policy Implementation and Health System Capacity

Latin American public health historians such as Steven Palmer and Gilberto Hochman have demonstrated the important role that domestic contexts and local conditions play in shaping the ways in which imported policy models are adapted and implemented in different countries. One of the key domestic factors cited by both scholars concerns the organization, structure, and existing capacity of health systems in different Latin American countries. Similarly, in their study of polio vaccine adoption decisions in Europe starting in 1955, Linder and Blume found that variations in health systems in different European countries helped explain variations in adoption and implementation decisions.

In order to systematically examine the influence of domestic health systems concerning their service delivery and policy implementation capacity throughout the course of my dissertation, I draw on PAHO’s framework on Essential Public Health Functions (EPHF). PAHO defines EPHF as, “the fundamental set of actions that should be performed in order to achieve public health’s central objective: improving the health of populations.”54 Drawing on the EPHF and the WHO’s World Health Report in 2000, I include several key variables under the umbrella

54 PAHO’s Essential Public Health Functions website at: http://www.paho.org/english/dpm/shd/hp/EPHF.htm
concept of policy implementation capacity within the health system. These variables include: (1) population access to basic health services and interventions; (2) execution of national policies at subnational levels; (3) distribution of health services and resources for health; (4) human resources for health; (5) flexibility of implementation structures to reach diverse populations. Chapters three and four highlight how variations in these different factors related to health system implementation capacity influenced domestic implementation attempts in Brazil and Mexico. Mexico’s existing implementation capacity was significantly higher than Brazil’s during the late 1950s and throughout the 1960s and early 1970s, which helped explain Mexico’s progress in controlling polio relative to Brazil’s during this period.

Public Health Precedent and Public Health Culture

Peter Baldwin includes the idea of public health culture and “historical public health memory” in his explanation for policy variation among industrialized countries responding to HIV/AIDS. He includes elements such as relative primacy of individual rights or collective welfare, traditions of voluntarism or state intervention, development of public health legislation, and institutionalized public health norms. Baldwin points to the example of the transformation of communist regimes after the fall of the Berlin wall, noting that drastic changes in political and economic systems had only minimal effect on public health strategies and policies favored under communism, arguing that public health culture contributed to the endurance of range of institutional formations and policies amidst chaos and systemic shocks. The effects of public health culture and precedent are highly visible in both Brazil and Mexico (and also in the Cuban example) throughout the timeframe covered in this dissertation.

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55 Baldwin, Disease and Democracy: The Industrialized World Faces AIDS.
56 Ibid., 252.
Public health culture and precedent develops based on accumulated and collective experiences concerning public health. They are conditioned by factors such as the extent to which government policies have been more or less successful in combating specific disease outbreaks or public health issues more broadly. More effective state intervention in previous epidemics is likely to produce greater levels of confidence in the existing system or future policy decisions, based on what I refer to as public health precedent. Increased domestic confidence in and support of existing approaches to combating disease outbreaks will influence policy variation and potentially offset the effects of intervention or foreign influence. Similarly, public health culture can impact receptiveness to foreign actors or ideas based on prior experience as well. Previous negative or positive experiences with foreign involvement in domestic public health issues will influence future receptivity and policy adoption. Baldwin refers to a “shared historical public health memory,” that influence policy variation based on a population’s shared previous experiences.57

Drawing on Baldwin I include a range of factors under the umbrella concept of public health precedent. These factors include: precedent of state responsibility for preventive interventions; the population’s previous experience with polio or other salient health issues; community participation in public health and the role of civil society; preventive versus curative public health culture; social norms concerning the role of the state in the provision of health and basic services.

Throughout my dissertation I examine how public health precedent influences not only political priority for a given disease but also processes of innovation and diffusion both nationally and cross-nationally, especially among neighboring countries where evidence of

57 Ibid.
previous successful policy adoption is likely to influence adoption prospects in a similarly situated country.58

Domestic Actors, Policy Advocates, and Communities of Experts

In Gill Walt’s landmark book, Health Policy: an Introduction to Process and Power, she calls for the integration of social science theories and studies of the health policy process with special attention to actors, process, and the context within which policy processes unfold. She argues that too many studies on health policy in the developing world focus exclusively on the content of health polices rather than the actors involved and the context within which processes that ultimately determine content and eventual implementation, unfold. Walt argues that policy researchers must pay more attention to power, who influences whom in the policy process, and how that happens.59 Similarly, scholars of agenda setting note the importance of actors who serve as political entrepreneurs, championing and mobilizing support for a particular issue or cause.60 Along with individual champions scholars like Peter Haas have introduced the idea of “epistemic communities” who share interests and expertise on a given issue and can play a role in shaping policies or mobilizing attention and support among government actors.61

Drawing on the international relations literature on the diffusion of norms and the influence of transnational actor networks, I include several different variables under the “actors and communities of experts” umbrella. First, I examine the role that key policy advocates or

58 Weyland, Bounded Rationality and Policy Diffusion.
“change agents” play in the diffusion of innovations drawing on Donald Schön’s description of the “Johnny Appleseed” model of diffusion.\(^{62}\) The Johnny Appleseed model involves key actors who travel from place to place, bringing ideas and new innovations with them, and sharing them with potential adopters as they go. The Johnny Appleseeds in my dissertation appear to have been more influential during the adoption period covered in chapter two focused on the polio vaccine adoption decisions between 1955-1961, and in the late 1970s and throughout the 1980s with the development of the Expanded Program on Immunization and regional campaign to eliminate polio (chapters five and six). In these periods there are key actors that help facilitate the cross-national diffusion of ideas and innovations. Examples include: Dr. Albert Sabin, developer of the live oral polio vaccine; PAHO polio advisors and directors; Ciro de Quadros, PAHO’s EPI Director; Rotary International leadership. One of the factors that helps explain the limited progress made in combating polio (and other vaccine preventable diseases) throughout much of the 1960s and early 1970s, was the absence of policy advocates or Johnny Appleseeds effectively championing the issue.

Also drawing on Schön, I examine the influence of “magnet models” of diffusion that involve bringing a range of different actors to a central location where they are then exposed to new ideas and innovations. The magnet model in this dissertation involves more formal training and education that occurs at central research, training, and educational institutions such as Yale University, the University of Minnesota, and the Pan American Health Organization. I examine how these magnets both contributed to the diffusion of ideas and innovations, and also facilitated the development of transnational actor networks and communities of experts related to polio and immunization. These actor networks subsequently facilitated the diffusion of innovations by increasing the circulation of new information and ideas and by facilitating the exchange of

\(^{62}\) Schön, *Beyond the Stable State*. 
experiences among actors within different networks throughout the region. The influence of these magnets is sometimes difficult to see because it often involves more gradual changes in public health ideology and paradigm shifts within the field that progress over a more extended period of time. Based on the more than 50-year period covered by my dissertation, I am able to examine the influence of these magnets and networks over an extended period of time and across multiple countries.

In addition to focusing on the role of the Johnny Appleseeds and the magnets, I also examine the role of domestic actors and communities of experts and the ways in which domestic champions or local expertise, influence both adoption and implementation decisions. I argue that the presence or existence of domestic champions and communities of experts is necessary, but not sufficient, to influence domestic policy decisions. This can be seen in the case of Brazil during the 1960s and early 1970s, when there were highly trained communities of experts with little influence in policymaking. I expect that in order for these domestic actors to have influence there must be overlapping networks or linkages between champions for a specific issue and/or communities of experts, and policymakers. In other words, champions must either have access to political and policymaking elites (either by being part of the policy system or through their networks) or communities of experts must be somehow integrated into or linked to the policy process. For example, in Mexico, a key factor that helps explain the high priority for polio within the Ministry of Health during the late 1950s and 1960s has to do with overlapping domestic actor networks linking researchers doing polio and related work, to leaders within the Ministry. The links between researchers and policymakers were often based on personal networks during the 1950s and 1960s, but became more formal and institutionalized during the 1980s, whereby
researchers were formally integrated into the health policy process within the Ministry of Health and related agencies.

*International Influence and External Actors*

In his work on social policy diffusion in Latin America, Kurt Weyland examines competing causal explanations thought to drive social policy diffusion. His objective is to examine whether “international forces overwhelm domestic actors in the era of globalization,” or whether, in fact, developing nations “retain a significant degree of autonomy.”63 A secondary question he explores concerns the motivations of domestic policy makers that drive policy decisions. As such he uses interviews with Latin American policymakers to examine the extent to which domestic actors were driven by a “normative appeal and the quest for international legitimacy” as commonly proposed by constructivists, or whether they acted out of self-interest “reflecting decision-makers’ institutional position and the incentives and constraints facing them.”64 Drawing on Weyland’s work I include a range of different external actors and influences (also discussed previously related to transnational actor networks and policy advocates), to examine the different ways in which they influence domestic policy decisions in Latin America. I examine a range of factors including: resolutions and specific policy recommendations made by international organizations such as PAHO related to polio and immunization; material assistance such as the provisions of vaccines or resources; technical cooperation provided in collaboration with domestic government; norms of “appropriate behavior” promoted by international organizations or powerful actors; the circulation of information, provision of training, and education to domestic actors.

64 Ibid., 23.
Drawing on Kurt Weyland’s work as well as the work of other scholars such as Steven Palmer, Marcos Cueto, and Gilberto Hochman, I argue that external actors and influences are by no means decisive in determining domestic policy decisions and less decisive still in determining outcomes. External actors were most influential in domestic policy processes by providing information, training, and facilitating adaptive capacity building, as in the case of the Pan American Health Organization. The evidence from this dissertation suggests an extremely limited role for factors such as coercion, imposition, or force, in domestic immunization policy decisions. The empirical evidence presented throughout this dissertation suggests that, while norms of “appropriate behavior” were influential in shaping domestic policy decisions in Latin America, the influence of these norms was conditional upon the fact that they were promoted by the Pan American Health Organization and collectively constructed by Latin American actors. As the examples involving the Salk vaccine and debates about mass immunization campaigns during the 1960s demonstrate, the norms promoted by powerful actors in the United States were far less influential in shaping policy decisions than those that were more clearly developed and diffused within Latin America.

Methods

The methods I use in my dissertation come from the field of comparative historical analysis. James Mahoney defines comparative historical analysis as, “a field of research characterized by the use of systematic comparison and the analysis of processes over time to explain large-scale
outcomes such as revolutions, political regimes, and welfare states.”  

Mahoney claims that, “researchers cannot rely on mainstream statistical tools” to assess necessary and/or sufficient causes of these “large-scale outcomes” of interest. Mahoney argues that it is possible to establish causality within small-n studies through comparisons between or among different cases and through comparing processes taking place within a single case.

My dissertation combines both cross-case and within-case analysis. I use cross-case comparisons of Brazil and Mexico to examine cross-national variations in how the same public health interventions (polio vaccines and immunization) were adopted, implemented, and institutionalized across the two countries at similar points in time. I do these cross-case comparisons at three different points in comparing what I refer to as three different implementation episodes in the two countries in the early 1960s, early 1970s, and starting in 1980, when polio immunization initiatives were launched in both countries at similar times. I use cross-case comparison to show that even when similar countries experience similar outcomes, the causal relationships between international and domestic factors may vary substantially. I argue that neither the sequence of domestic nor external events alone has sufficient explanatory power, but rather that it was the interaction of the two that shaped polio immunization programs as well as the Expanded Program on Immunization.

I supplement these cross-national comparisons, with within-case comparisons of the three different implementation episodes in each of my country cases. I compare the different episodes in each country to examine the extent to which changes in contextual variables influenced domestic policy processes at different points in time within the same country. This is

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66 Ibid., 82.
based on Mill’s “method of difference” which, according to Charles C. Ragin, “involves comparisons of cases differing in only one causal condition, the treatment variable” through the use of “longitudinal comparisons.”68 Ragin uses Theda Skocpol’s work as an example of this within-case strategy. By comparing Russia in 1905 and Russia in 1917, Skocpol was able to identify key differences between the two points in time that helped explain why revolts in 1905 had not produced the same results as those in 1917 which resulted in the Russian revolution.69 This approach is based on the assumption that a range of key independent variables can be held constant across the two episodes within the same country.

However, Ragin notes that there is a significant issue limiting this sort of within-case comparison. Ragin writes, “One key difference between Russia in 1917 and Russia in 1905 is the simple fact that 1917 Russia had already experienced 1905 Russia, whereas 1905 Russia had not.”70 In my dissertation I attempt to turn this limitation of within-case comparisons into an asset. One of the primary objectives of my dissertation is to examine the extent to and ways in which domestic policymakers learn not only from external models but also from internal models and previous domestic policy experiences. Within the context of my dissertation, the fact that 1980 Mexico had already experienced 1961 (and 1971) Mexico, whereas 1961 Mexico had not, is essential for my research design and necessary for examining what I refer to as possible “domestic policy learning effects.”

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69 Ibid.
70 Ibid.
Process Tracing and Starting Points

I use process-tracing to identify decision processes whereby “initial conditions are translated into outcomes.” This approach holds that issues of timing and sequencing are keys to understanding decision making processes and that it is not only what decisions get made, but also when they are made, and in what context. Tulia Falleti writes, “The choice of a starting point in a trajectory of events has implications for the identification of causal mechanisms that link initial event to later ones.” For the purpose of comparisons, I begin my analysis of implementation episodes in each of my case studies when formal adoption decisions were made concerning polio vaccines and associated immunization strategies.

The first comparisons begin in chapter two when formal adoption decisions were made concerning the use of the two different polio vaccines as part of official government immunization programs. The first polio vaccine, an inactive or “killed” vaccine, was developed by Dr. Jonas Salk during the first half of the 1950s and licensed for use and production in the United States in April of 1955. During the same period of time three other researchers (or teams of researchers) were working to develop alternative attenuated “live” oral polio vaccines. Large-scale field trials of the live polio vaccines began in 1957 and continued throughout the remainder of the 1950s. By 1960 there were two different polio vaccines that domestic public health officials could choose to adopt and make use of in different ways. The two vaccines had very different characteristics ranging from their costs and availability to their administrative methods.

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73 Tulia G. Falleti, Decentralization and Subnational Politics in Latin America (Cambridge University Press, 2010), KL868.
74 In many countries in the Americas both vaccines were used by private physicians or administered on a very limited basis within specific communities, however as a study of public health policies I am only interested in adoption and implementation decisions made by governments and public health officials.
75 What is not commonly acknowledged is that many of the field trials took place in the Americas with over 11 countries in Latin America and the Caribbean participating in and hosting live vaccine field trials between 1958-1959.
and proven effectiveness. In many countries in the Americas both vaccines were used by private physicians or administered on a very limited basis within specific communities almost immediately after the vaccines became available, however as a study of public health policies I am only interested in formal adoption and implementation decisions made by governments and public health officials. As such, the “starting point” in each of my cases is when government officials make the decision to use polio vaccines within government immunization programs.\(^{76}\)

The variation of interest in chapter two concerns the cross-national variation in adoption decisions throughout the region.

In subsequent chapters, the starting point in each of my case studies is when a formal decision is made by national government authorities to launch national polio immunization initiatives. The starting points mark the onset of the implementation stage of the policy process in each country at a given point in time. During the 1960s and 1970s and even in the early years of the 1980s, these initiatives were often “national” in name only, and weren’t effectively scaled up to cover all states or subnational units within a given national territory. Moreover, in all of my cases there were various subnational initiatives launched and implemented to varying degrees at different points in time throughout the time period covered in this dissertation. These subnational initiatives are only addressed insofar as they were used as pilot programs as part of larger national programs, or when subnational demonstrations subsequently influenced the adoption or development of national programs.\(^{77}\)

Drawing on Tulia Falleti’s work on comparative process of decentralization, I’m limiting my focus to formal decisions made by national government

\(^{76}\) Polio vaccines were also often administered by private physicians or in collaboration between private and public entities, however I am specifically interested in the public policy decisions related to polio vaccines and immunization.

\(^{77}\) See Falleti (2010) for more on the choice of starting points.
officials in an effort to establish a basic level of “analytical equivalence” across the processes I am comparing across my case studies.\textsuperscript{78}

Case Selection

My dissertation is a comparative study of the development of polio and immunization policies in the two largest and most populous countries in Latin America: Brazil and Mexico. There are clear guidelines for designing small-n studies with the objective of establishing causal inference. The emphasis is on systematic collection of data on the same variables across carefully selected units of analysis (countries in my study). King, Keohane, and Verba suggest using “matching” to select case studies based on common characteristics with the objective of holding as many other things constant as possible and limiting omitted-variable bias, but selecting what to observe within case studies according to other criteria. I selected Brazil and Mexico based on a number of considerations. The two countries share a range of similar characteristics that strengthen the cross-case comparisons throughout my dissertation. The key similarities include: geography and demography; material resources for public health and immunization; longstanding biomedical research traditions and institutions; federal systems and three levels of government; similar disease burdens related to polio at the different points in time examined in this study; established domestic communities of experts; links to transnational actor networks and international organizations. Additionally, as members of the inter-American system the two countries were influenced by similar external but regional paradigm shifts regarding public health and

\textsuperscript{78} See Falleti, \textit{Decentralization and Subnational Politics in Latin America}, for more on analytical equivalence and comparative analysis of decentralization processes and policies in Latin America.
development promoted by different regional organization such as PAHO, the Inter-American Development Bank, and the Organization of American States.

Both countries are highly populous and geographically diverse. This has created a range of obstacles in terms of expanding access to health care and developing innovations to reach “hard-to-reach” populations with immunization programs in order to ensure that immunization initiatives reach sufficiently high proportions of the desired target populations to prevent disease outbreaks. Additionally, in both countries there is considerable subnational diversity across subnational units concerning factors such as disease burden, access to health care, resources, socioeconomic status of the population, and relationships with central governments. Based on these shared domestic conditions it is logical to assume that both countries faced similarly significant implementation constraints that had to be overcome in order for immunization initiatives to be more effectively adapted, implemented, and institutionalized.

An additional similarity is that both countries had among the most advanced domestic laboratory and developing public health research capacities in the Region by the late 1950s. While Mexico stands out as the only country in Latin America with the domestic capacity required to produce either of the two polio vaccines throughout the 1950s-1970s, both countries had comparatively strong domestic laboratory and diagnostic capacity required to support effective immunization campaigns, relative to other countries in the region during similar time periods. Both countries had the basic foundation for laboratory work and health research, however, they chose to use their existing capacities in different ways, and in different ways at different points in time. For example, in Mexico there was more consistent collaboration between public health laboratories, research, and public health programs, early on than appears
to have been the case in Brazil. Brazil developed more integrated approaches to combining public health research and practice much later in the 1980s.

A third key similarity across the two countries concerns their longstanding relationships with international organizations and funding agencies. Both countries were prominently featured within the Rockefeller Foundation’s funding portfolio starting as far back as the 1920s. Both countries consistently received large institutional grants from the RF to support the development of national schools of public health and/or medicine, develop specialized medical education and nurse training programs, and strengthen or create domestic public health laboratories. The RF provided similarly large numbers of individual research grants and scholarships to domestic actors in both countries for advanced studies in public health and biomedical sciences, with former RF fellows typically returning home and assuming leadership positions within domestic governments or teaching institutions. Both countries were similarly active members of the Pan American Health Organization and early regional leaders within UNICEF.

Another key factor influencing my choice of cases has to do with the necessarily limited sample size I began with. In order to conduct the kind of extended historical analysis advanced in this dissertation I needed countries with comparably extensive histories concerning polio and immunization initiatives and also countries that still had polio by the early 1980s when regional and international initiatives focused on polio eradication developed within organizations like PAHO/WHO and UNICEF. By the time the regional campaign to eradicate polio was launched in the Americas in 1985, there were only 11 countries that had not yet interrupted polio transmission. These countries included: Bolivia, Brazil, Colombia, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Paraguay, and Peru.
In order to facilitate the comparisons across cases over time, I needed cases that were comparable at different points in time in terms of relative levels of development, GDP growth, government structure, and disease burdens. Brazil and Mexico matched my entire selection criterion. Additionally, both countries adopted similar polio immunization initiatives at roughly similar times during the early 1960s, early 1970s, and again starting in 1980, however the extent to which they were implemented and the ways in which they were implemented varied considerably at some points in time. To the extent that the basic independent variables do exhibit some variation over time, the variation is similarly present across both cases. For example, in the case of government structure, both countries embarked on public sector decentralization reforms during the 1980s that were underway in both countries during the third implementation episode examined in chapter six of this dissertation.  

Sources, Data Collection, and Analysis
Throughout the course of the past two years I have created a database of the relevant events that took place between the late 1940s and 1994 (when polio was eliminated in the Americas) tracking the involvement Latin American researchers and public health officials in international initiatives to generate a detailed account of the interactions between domestic and international actors linked to polio over a nearly fifty-year time period. Additionally, I have created data bases and detailed timelines of both regional/international developments and events, as well as domestic events covering the same fifty-year time frame to provide the foundation for both

79 See Falleti (2010) for more on the similarity of “starting points” concerning decentralization reforms in Brazil (1979-1985) and Mexico (1982-1988).
regional and domestic process tracing to examine the timing and sequencing of events linked to polio and immunization initiatives in the Americas.

I have relied heavily on technical reports and the extensive documentation available from the Pan American Health Organization to ensure that I have similar sources of data across my case studies including domestic capacity building initiatives, technical cooperation, and basic health indicators. Whatever errors there are in the data concerning disease incidence and reporting and surveillance, are systematic errors and are thus consistent across my cases based on the fact that I am consistently using the same sources of disease-specific data for all cases included within my dissertation as well as regional-level data.

I have collected and analyzed data from Annual and Quadrennial Reports from the Pan American Health Organization for every year between 1940 and 2000. I have systematically searched these 200-400 page documents using the same search terms for every country and for every year. One aspect of my data collection from these reports has been focused on different diffusion mechanisms related to knowledge exchange and domestic capacity building throughout the region. More specifically I have collected information on: collaborative research related to polio, immunology, virology, and immunization programs; specific training and formal educational initiatives carried out by PAHO or specific Member Nations; national and international conferences or forums related to polio, immunization, immunology, and virology; specific technical cooperation provided by PAHO to Member Nations or multi-nation cooperative projects focused on polio or polio-related initiatives; other capacity-building efforts such as laboratory development initiatives, immunology research and training programs, and disease surveillance projects. I have collected additional data from other international organizations or donor agencies including the United States Agency for International
Development (USAID), UNICEF, the Rockefeller Foundation, and the Inter-American Development Bank (IDB).

I have then used the data collected from international organizations and technical cooperation initiatives, to examine the relationships between these external initiatives and domestic policy, program, and institutional developments. I use a range of data sources to examine domestic conditions and developments in each of my case studies in an effort to examine the extent to which observed changes in policies or program strategies were driven by the previously mentioned external factors relative to changes in domestic conditions and contexts. For both countries included within my dissertation I have constructed a detailed history of relevant developments related to my key independent variables to provide a foundation for each of the case studies at different points in time and to facilitate both my within-case and cross-national comparisons. I have created these histories using a combination of domestic public health reports, policy documents, interviews with key domestic actors, and a wide range of secondary sources.

In an effort to examine longer-term trends, more gradual and incremental developments, paradigm shifts, and, what Everett Rogers refers to as “consequences” of diffusion that unfold over time, throughout the course of the past two years I have examined over 300 PAHO documents including technical reports, transcripts of Executive Committee and Directing Council meetings going back to the early 1950s, every Annual Report of the Director as well as Quadrennial Report of the Director between 1940 and 2000, every Report to the Director made by PAHO’s Advisory Committee on Medical Research going back to 1961 (the year it was established), every issue of PAHO’s EPI Newsletter between 1979-2000, and a range of other official PAHO and WHO publications. Additionally, I have examined hundreds of PAHO’s
specific technical cooperation projects, linked to immunization and related capacity building, provided both to individual Member Nations and those of a more regional nature extending back to the 1950s. The detailed country-specific information included within the range of PAHO documents examined allowed me to trace the evolution of domestic initiatives related to immunization programs over a more than fifty-year time period.

My objective in doing this admittedly tedious historical analysis and process tracing over such an extended period of time has been to examine the longer-term consequences that PAHO’s technical cooperation and diffusion-oriented work has had in the region, as well as how interactions between PAHO’s “external influence” and domestic factors have shaped these consequences. In addition, I have collected data from different meeting and conference transcripts from PAHO Executive Committee, Directing Council, and Sanitary Conference meetings taking place during this roughly fifty-year time period. My objective in including meeting and conference reports and transcripts has been to identify key actors involved in the development of regional immunization initiatives, key themes and debates that emerged during meetings that may not have been reflected in Annual Reports, and trace the evolution of both domestic and PAHO positions on immunization programs over time. Along these lines, I have also included transcripts and conference proceedings from relevant scientific and professional conferences that took place during the time period covered in my dissertation. My objective has been not only to trace the emergence of different actor networks involved in polio and immunization initiatives in the Americas during this time period, but also to examine the ways in which these international conferences served as knowledge exchange forums and influenced diffusion processes in the Americas over time. Additionally, I have attempted to trace the
The primary archival work I have done during the course of the past two years has been in the archives of Dr. Albert Sabin, who developed the live oral polio vaccine that was ultimately adopted by every country in the Americas and continues to be widely used worldwide. I have worked with the archivists at the University of Cincinnati to collect data concerning the interactions between Latin American scientists and researchers and North American actors, to examine how actor networks contributed to the diffusion of polio vaccines and other related knowledge. The archives include an extensive body of material covering the entire time period covered within my dissertation and detailed information on all of my case studies as well as information related to polio initiatives in other Latin American countries and regional/international organizations.

In addition to working at the archives at the University of Cincinnati, I have also had access to Dr. Sabin’s personal papers that, until recently, were not available in the Sabin Archives. I was able to secure access to these files thanks to the generosity of Dr. Sabin’s widow, Mrs. Heloisa Sabin, who allowed me full access to previously unseen materials concerning the development of the regional polio initiative as well as international polio research dating back to the late 1940s. I have also collected information from the archives of Rotary International, the Oswaldo Cruz Institute, the Pan American Health Organization, the Rockefeller Foundation, and UNICEF.
In addition to archival materials I have also conducted semi-structured interviews with key policymakers involved in the regional polio eradication initiative as well as both Mexican and Brazilian programs. The number of people I have been able to interview is necessarily limited by the historical nature of this dissertation due to the fact that the majority of the senior figures involved in polio initiatives in the Americas prior to 1980, are no longer alive. Over the course of the past 18 months I have conducted roughly 40 hours of interviews with key actors related to my dissertation. Additionally, I have used interviews and oral histories conducted by other researchers with actors from a range of Latin American countries.

Chapter Summaries

Chapter Two

Chapter two focuses on the innovation diffusion of two different polio vaccines that became available in the Americas (and worldwide) during the second half of the 1950s and first years of the 1960s. An inactive or “killed” poliovirus vaccine was developed by Dr. Jonas Salk and was licensed for production in 1955. An alternative attenuated or “live” oral poliovirus vaccine was developed by Dr. Albert Sabin during the second half of the 1950s that was licensed for commercial production and use in the United States in the early 1960s. The two different vaccines had very different characteristics related to the properties of the vaccines, their costs, the way in which they produced immunity, and their administrative requirements. Additionally,

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80 There were three different strains of the live oral polio vaccine initially developed by three different researchers, however the strains developed by Dr. Sabin were ultimately selected for use in live vaccines licensed and produced in the United States and worldwide in the early 1960s.
the two different vaccines had very different backers promoting their diffusion. While powerful interests in the United States, most notably the National Foundation for Infantile Paralysis and the United States Government championed the diffusion of the Salk vaccine, a more international cadre of researchers and public health officials from developing countries actively promoted (and facilitated) the diffusion of the live oral polio vaccine.

Chapter two examines the intense and oftentimes politically charged debates that took place within the region about which of the two vaccines to adopt. Chapter two uses process tracing at both the national and regional levels to uncover the interactions among domestic and external factors that influenced the cross-national diffusion of polio vaccines in the Americas during the second half of the 1950s. Chapter two is focused primarily on the innovation adoption phase of the policy process, with subsequent chapters focused on later phases that include adaptation, implementation, and institutionalization.

Ultimately chapter two demonstrates that a number of factors associated with live oral polio vaccine contributed to its much more widespread and rapid diffusion as compared to the inactive Salk vaccine. These factors included: a strong transnational (regional) actor network and community of experts linked to the live polio vaccine; domestic health system organization and capacity in countries throughout the region that made the live vaccine a more feasible policy option; geoepidemiological factors (Weyland’s “neighborhood effects”) that enabled Latin American public health officials to observe one another’s experiences with the different vaccines and easily circulate information with another based on proximity; the strong policy advocacy and resource mobilization of the Pan American Sanitary Bureau on behalf of the live vaccine throughout the region.
An additional objective of this chapter is to introduce Everett Rogers ideal-type centralized and decentralized diffusion models and to examine the extent to which the two different ideal-types help explain the observed variation in innovation diffusion processes related to the Salk vaccine and live oral polio vaccines between 1955 and 1961.

Chapter Three

Chapter three examines what happens once a given policy or innovation has been adopted in a given country focusing on the implementation phase of the policy process. Chapter three covers the period between the late 1950s and early 1960s, when every country in the Americas adopted the live oral polio vaccine and attempted to administer it in some form of immunization program. The core policy debate in chapter three concerns the tensions between two basic implementation strategies: mass immunization (or more targeted) campaigns and routine immunization services carried out as part of broader health programs.\(^\text{81}\)

Chapter three begins with the case of Cuba where the live polio vaccine was used to launch the region’s most dramatic and highly effective anti-polio campaign starting in 1962. Beyond identifying the core elements of the Cuban model that help explain its effectiveness, chapter three examines possible reasons for the delayed diffusion of the model, challenging typical explanations linked to Cuba’s communist political system, and providing an alternative explanation linked to domestic institutional capacity. In addition to the Cuban case, chapter three uses a paired case study of Brazil and Mexico to examine how different combinations of external

\(^{81}\) The distinction or supposed tension between these two strategies was addressed in the region of the Americas through the Expanded Program on Immunization (EPI) starting in 1977. It was recognized that while routine immunization services and permanent health infrastructure was the objective of the EPI, it was necessary to combine strategies of mass campaigns and routine services to consistently reach hard-to-reach populations.
and domestic factors interacted with one another to shape policy implementation efforts and outcomes during polio campaigns launched in both countries in the 1960s.

Chapter three highlights implementation constraints that impeded progress in immunization program that were not unique to the two cases, but were common across countries in the region. These are the factors that explain the observed variation between the implementation experiences of Mexico and Brazil: (1) geoepidemiology - the influence of shared borders, availability of information from neighboring countries to draw on, pressure from other countries to adopt specific policies; (2) stewardship - related to the government’s ability and authority to formulate and enact policies, collect and disseminate information, regulate and monitor, and coordinate the activities of different actors within the overall health sector; (3) domestic public health precedent - existing vaccination legislation, tradition of state intervention in or responsibility for public health interventions and vaccination, norms of preventive versus curative care; (4) policy advocates and communities of experts and the extent to which they had access to political elites and influence within the policy process; (5) health system implementation capacity - including scope of the health system concerning population access to services, subnational implementation capacity to adapt and execute national policies.

Chapter Four

In spite of the fact that polio vaccines were widely available and had been adopted by every country in the region during the 1960s, chapter four examines the key factors that continued to constrain immunization programs in the region in the late 1960s and early 1970s. Chapter four examines how domestic examples (both positive and negative) during the 1960s, resulted in a gradual change in strategies promoted by PAHO at the end of the 1960s and early 1970s.
Whereas during the early 1960s PAHO frequently promoted routine immunization services as part of more comprehensive services, using the United States as an example, by the end of the 1960s PAHO’s recommendations became more reflective of the domestic capacity constraints in most Latin American countries. Starting in the late 1960s and early 1970s PAHO began promoting a broader range of immunization strategies based on the needs of PAHO Member Nations. Increased priority for polio within PAHO was demonstrated by two regional resolutions proposing regional polio control programs in 1968 and 1971. However, the case studies from Brazil and Mexico during the early 1970s demonstrate that both stewardship functions and the implementation and service delivery capacity of domestic health systems, were inadequate to effectively control or eliminate polio during the early 1970s. Ultimately, chapter four demonstrates that, while regional resolutions did influence domestic adoption decisions in both Brazil and Mexico, in the absence of changes in domestic capacity and local conditions, immunization programs were derailed during the implementation stage of the policy process.

Chapter Five

Chapter five revisits Everett Rogers’ ideal-type centralized and decentralized diffusion models discussed in chapter two, to examine the innovation development and diffusion processes associated with the Expanded Program on Immunization (EPI). The EPI was established within the WHO in 1974 and formally adopted by PAHO in 1977 and included six common and vaccine preventable diseases: diphtheria, whooping cough, tetanus, measles, poliomyelitis and tuberculosis. The EPI involved a series of health system organization and capacity development initiatives focused on establishing national governments as stewards of their own national immunization programs and outlining a series of essential stewardship functions related to the
EPI. These initiatives focused on increasing high-level political priority and resources allocated for immunization programs, facilitating capacity building within national Ministries of Health, establishing long-term immunization program plans, creating national program guidelines and evaluation mechanisms, and increasing access to information for domestic immunization officials. Another group of EPI-related initiatives helped strengthen health system capacity related to local-level implementation and service delivery. These initiatives focused on expanding access to immunization services through different service delivery strategies, increasing local-level expertise through EPI training programs, and facilitating greater community participation in immunization initiatives. These health system capacity developments facilitated the dramatic progress made throughout the region in the 1980s resulting in the total regional elimination of polio in the early 1990s.

Chapter five uses the development and diffusion of the EPI in the Americas to examine the emergence of what appears to be a sort of hybrid diffusion model that combined elements of both Everett Rogers’ centralized and decentralized diffusion models discussed in chapter two. Additionally, chapter four examines how the emerging hybrid system functioned and the ways in which it affected innovation-decision processes associated with the EPI in the Region. Everett Rogers defines the innovation-decision process as:

“The process through which an individual (or other decision-making unit) passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.”

Chapter five argues that the hybrid diffusion system associated with the EPI for the region of the Americas helps explain not only the extremely rapid innovation adoption related to the EPI, but also the way in which EPI programs were adapted, implemented, and

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82 Rogers, *Diffusion of Innovations*, 168.
institutionalized in countries throughout the Americas between 1977 and 1984. Building on the experience in chapter two concerning the diffusion of the live oral polio vaccine, the diffusion of the EPI can be explained by: (1) transnational (regional) actor networks and communities of experts involved in the development of the EPI from its inception; (2) the compatibility of the EPI with existing health system capacity in the region (the EPI addressed a range of health system capacity development needs); (3) the strong advocacy, facilitation, and resource mobilization of the Pan American Health Organization on behalf of the EPI; (4) geoepidemiological factors such as the ease with which innovations and information were circulated throughout the region.

Chapter Six
Chapter six revisits the paired case study of Brazil and Mexico from chapters three and four, and examines how changes in my key independent variables across implementation episodes in each country influenced the development, implementation, and institutionalization of polio immunization initiatives in both countries starting again in 1980. In each of the two cases I conduct a within-case analysis comparing implementation attempts during the 1960s and early 1970s, with post-1980 implementation. These within-case comparisons demonstrate how changes in domestic context, especially linked to changes in stewardship at the national level and increased adaptive capacity within the health sector, facilitated more effective program adaptation (learning from domestic and external examples), as well as more effective implementation starting in 1980. In each case I also examine the range of institutional legacies produced in part by the EPI-polio campaigns and examine the extent to which cross-national variations identified during previous chapters help explain similar cross-national variations
concerning institutional legacies and consequences. Chapter six illustrates that while the campaigns were highly significant, many of the proposed institutional legacies and much of the cross-national variation in legacies, were highly influenced by antecedent domestic conditions and concurrent developments in health programs and strategies at both domestic and regional levels.
Prior to World War II, polio was viewed as a disease that primarily affected the most advanced industrialized countries. However, during the early 1950s, developing countries, especially in Latin America and the Caribbean, began reporting epidemics of increasing severity and frequency indicating that polio was quickly becoming a problem for public health officials worldwide. The emergence of polio as a problem beyond the industrialized world was accompanied by a massive surge in polio vaccine research that ultimately led to the development of two types of polio vaccines. The inactivated or “killed” poliovirus vaccine was developed by Dr. Jonas Salk and licensed for use in 1955. The second vaccine was a live attenuated poliovirus vaccine taken orally that was developed by three different researchers (or teams of researchers) in the second half of the 1950s. The availability of two very different vaccines to combat the same disease presented public health officials with a series of decisions regarding the adoption and widespread use of a polio vaccine.

In their study of polio vaccine adoption decisions in the United Kingdom, the Netherlands, and West Germany, in 1955-1956, Lindner and Blume explain:

Health policy analysts tend to explain the decision to introduce a new vaccine, or to replace an existing vaccine by a new alternative, in terms of the epidemiology and seriousness of the disease, and of scientific consensus regarding the efficacy and potential risks of the vaccine and (perhaps) their costs. The studies of vaccine diffusion and adoption that they conduct have little or nothing to say about political disagreements, or the influence of commercial interests, national traditions, international relations, or global agendas.  

In their multi-country study the authors ask, “Do - and more importantly can - scientific and epidemiological data determine vaccine policy in the way assumed by most contemporary policy

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The historical evidence from their studies on adoption decisions in Europe suggests not quite.

Lindner and Blume ultimately explain the variation in adoption across their case studies by highlighting factors that include: existing health system organization; the relative centralization of public health policy decision-making; the “national innovation system” linking vaccine producers and the state; public health precedent and domestic immunization traditions. The historical evidence from polio vaccine adoption decisions in the Americas suggests a sort of middle ground, supporting Lindner and Blume’s challenge to contemporary policy analysis by highlighting the importance of broader contextual factors, but also demonstrating that scientific and epidemiological data played a similarly significant role in shaping vaccine adoption decision in Latin America during the late 1950s and early 1960s. Additionally, the evidence from the Americas during this period highlights the important role that overlapping actor networks and communities of experts played in driving innovation diffusion processes and adoption decisions in countries throughout the region.

This chapter uses the innovation diffusion of the inactive Salk polio vaccine and live attenuated oral polio vaccine in the Americas between 1955 and 1961 to examine the different factors and causal mechanisms driving innovation diffusion processes in the region. Innovation diffusion as defined by Everett Rogers involves the process through which innovations are developed and then information about the new innovation spread to potential adopters, followed by potential adopters developing opinions (favorable or unfavorable) about the new innovation resulting in an adoption decision, and ending with a confirmation of the adoption decision.

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2 Ibid.
3 Ibid., 443-46.
leading either to the innovation’s more widespread use or alternately the discontinuance of the innovation. Rogers writes:

This process consists of a series of choice and actions over time through which an individual (or an organization) evaluates a new idea and decides whether or not to incorporate the innovation into ongoing practice. This behavior consists essentially of dealing with the uncertainty that is inherently involved in deciding about a new alternative to those previously in existence.

This chapter uses process tracing at both the national and regional levels to examine how interactions between domestic and external factors help explain the cross-national diffusion of polio vaccines in Latin America during the second half of the 1950s. Building on the work of Lindner and Blume, this chapter demonstrates that epidemiological and scientific data alone cannot explain the variation between the diffusion processes associated with the inactive Salk and live polio vaccines in the region. Instead, while still accounting for the significant influence of epidemiological and scientific data, polio vaccine adoption decisions in the region can best be explained by a combination of other key factors that include: (1) domestic health system capacity; (2) geoepidemiological factors such as the decisions made by other Latin American countries and the observed experiences of near-peers (other countries in Latin America); (3) the promotional efforts of key actors and international organizations such as the Pan American Sanitary Bureau; (4) domestic communities of experts and transnational networks of researchers and public health officials in the region through which information about the two vaccines was circulated.

An additional objective of this chapter is to examine the extent to which Everett Rogers ideal-type centralized and decentralized diffusion models help explain the observed variation in

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4 Rogers, *Diffusion of Innovations*, 168.
5 Ibid.

The Emergence of Transnational Polio Networks in the Americas

Poliomyelitis (polio) is a highly infectious viral disease caused by a human enterovirus called poliovirus. Enteroviruses like poliovirus are “transient inhabitants of the gastrointestinal tract” that are ingested, multiply in the intestine, and are then shed in the feces of infected individuals.6 There were three critical discoveries that paved the way for the development of vaccines to combat polio. The first came in 1908 when Viennese researcher Karl Landsteiner extracted liquid from the spinal cord of a young boy who’d recently died of polio and then injected it into rhesus monkeys, successfully infecting the two monkeys and thereby isolating the poliovirus for the first time.7 In his Pulitzer Prize winning, *Polio: An American Story*, David Oshinsky writes that Landsteiner’s discovery “opened a new chapter in the polio story, the beginning of serious laboratory research.”8

Another major breakthrough came in 1949 when a Johns Hopkins University research team including David Bodian, Howard Howe, and Isabel Morgan, demonstrated that there was not one but rather three different strains of the poliovirus, each requiring its own vaccine strain to combat it.9 A third critical discovery was made in the laboratory of John Enders at Harvard’s infectious disease laboratory at Boston Children’s Hospital during the same time period (1948-1949). John Enders and two of his pediatric research fellows, Thomas Weller and Frederick Robbins, proved that it was possible to grow strains of the virus in test tubes rather than in

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6 Centers for Disease Control, Polio Information Sheet
8 Ibid.
human or animal nervous or spinal tissues, which was the only truly safe way to cultivate a virus for use in a potential vaccine. This discovery ultimately garnered the Nobel Prize for the three men in 1954 and paved the way for the future mass production of polio vaccines.  

The vast majority of all polio research conducted in the United States (as well as many studies conducted by collaborative research teams in the Americas) was funded by the same source: the National Foundation for Infantile Paralysis (now known as the March of Dimes). In the 1930s the National Foundation allocated large institutional grants to prominent U.S. universities including Johns Hopkins, the University of Michigan, and Yale, to strengthen virology laboratories and establish “polio groups” to carryout collaborative polio-related research. One of the spillovers of these institutional grants was the emergence of domestic and international networks of polio and related researchers. These networks became a critical factor in driving innovation diffusion and the cross-national circulation of polio-related research throughout the Americas and the world starting in the 1940s. These networks will continue to be a significant factor in explaining cross-national diffusion of innovations and polio-related information throughout this chapter and the remainder of the dissertation.

The dramatic increase in polio-related research in the United States starting in the 1940s coincided with a “historical accident” related to World War II that had a significant influence on the subsequent developments of international polio and immunology networks. Prior to World War II, Latin American (and also North American) elites primarily pursued advanced studies in science and medicine at European institutions such as the Pasteur Institute in Paris. World War II disrupted this tradition closing many European institutions and curtailing travel between the

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11 The National Foundation similarly provided a large number of scholarships for researchers from all over the world to study in polio or immunology laboratories in the United States.
13 Ibid.
Americas and Europe. As a result, research and educational institutions in the United States suddenly became choice destinations for Latin American scientists.

A Pan American Health Organization (PAHO) report explained that one of the “enduring indirect effects” of the War was “to reorient the entire scientific community from Europe to the United States.”\textsuperscript{14} According to the report this resulted in the development of a “closely woven set of personal and professional relationships in all fields of science.”\textsuperscript{15} In addition to the relationships formed, Latin American researchers and students were also exposed to a different education system, structure, and culture in the United States. The North American education system included, among other things, “more freedom of action, smaller classes, informality between the professor and themselves, a high degree of independence in the prosecution of their [students’] research programs, and an opportunity of broadening their experience through collaborative programs.”\textsuperscript{16} Many of these students, as well as those trained in European institutions, returned home and became leaders in education and medical research in their respective countries during the 1940s and 1950s. As a result, by the end of the 1940s there was already a small but growing foundation for collaborative research and the emergence of polio-related networks in the Americas.

Prior to World War II it was widely believed that polio was predominantly a disease of the industrialized world and less problematic in tropical and developing countries where sanitary conditions enabled the widespread circulation of wild polioviruses that produced a naturally acquired immunity in infants and young children. A clear shift in perspectives about polio

\textsuperscript{15} Ibid.
beyond the industrialized world can be seen starting in July of 1948 with two key events. One was the First World Health Assembly of the newly established World Health Organization (WHO) that called for international collaboration to advance existing knowledge about polio.\textsuperscript{17}

Another key event was the First International Conference on Polio organized by the National Foundation for Infantile Paralysis and held in New York City in July of 1948.\textsuperscript{18} The Conference was attended by delegations from 38 countries including 10 from Latin America and the Caribbean.\textsuperscript{19} Delegates from Brazil and Chile were leaders within the Conference and on the Conference’s original organizing committee. During the closing session, on July 17, 1948, Brazilian delegate Dr. Oswaldo Pinheiro Campos proposed a resolution to establish a permanent World Congress on Poliomyelitis, which was seconded by Chilean delegate Dr. Hernan Romero. Basil O’Connor, the director of the National Foundation explained that the World Congress would “keep scientific and medical men abreast of new polio discoveries, experiments, and developments. The fastest, most effective and practical means available will be used to disseminate this knowledge, so that scientists and doctors working even in the remotest laboratories, hospitals, and localities will have access to it.”\textsuperscript{20} The headline in the \textit{New York Times} the following day announced: “Polio war mapped on a global scale.”\textsuperscript{21}

Polio received another boost within the World Health Organization in 1953 with the establishment of the WHO’s Expert Committee on Poliomyelitis. Porras et al. write that

\begin{itemize}
  \item \textsuperscript{18} In addition to studying alongside one another at a range of prominent research and training institutions, these international conferences focused on polio and related issues in immunology constituted another factor helping to explain the emergence of transnational polio networks and the diffusion of polio-related information in the Americas starting in the late 1940s.
  \item \textsuperscript{19} Countries included: Argentina, Brazil, Chile, Colombia, Cuba, the Dominican Republic, Guatemala, Mexico, Peru, and Uruguay.
  \item \textsuperscript{20} Basil O’Conner is quoted in William Laurence, “Polio War Mapped on Global Scale,” \textit{The New York Times}, July 18, 1948.
\end{itemize}
members of the Committee “were appointed on their own merit, not as representatives of governments, institutions, or associations, although efforts were made to ensure some geographical spread.”\textsuperscript{22} The authors continue suggesting, “The criterion of competence rather than nationality led to a kind of trans-national community of experts with roots in the international public health movements of organizations founded prior to the setting up of the WHO.”\textsuperscript{23} One of these organizations was the Pan American Sanitary Bureau (discussed later in this chapter). As will be seen in the remainder of this chapter and throughout this dissertation, these transnational communities of experts played a significant role in facilitating the diffusion of innovations and new information linked to polio and related issues in virology and immunization throughout the 1950s and beyond.

The opening paragraph of the WHO Expert Committee’s first report published in 1954 stated, “The transformation of the relatively uncommon ‘infantile paralysis’ of the 19th century into ‘epidemic poliomyelitis’ of almost worldwide distribution presents today one of the most formidable public-health problems.”\textsuperscript{24} The report acknowledged that, “Before the second World War, poliomyelitis was thought to be a rare disease in tropical countries, but it is now known that the incidence of paralytic cases in these areas does not reflect the incidence of infection.”\textsuperscript{25} The report cautioned, “Poliomyelitis often lies hidden in tropical communities, and the true incidence is not recorded in official returns.”\textsuperscript{26} This statement that “true incidence” of polio was not reflected by official public health data was a statement about the current status of

\textsuperscript{22} Porras, Buguena, and Ballester, "Spain and the International Scientific Conferences on Polio, 1940s-1960s," 98.
\textsuperscript{23} Ibid.
\textsuperscript{25} Ibid., 16.
\textsuperscript{26} Ibid., 42.
epidemiological surveillance capacity in most developing countries, and even many of the more industrialized countries to a certain extent. 

The Pan American Sanitary Bureau first began compiling and circulating multi-year summaries of health conditions and disease data in the Americas in 1950. The first multi-year summary for 1950-1953 included information on 15 communicable diseases. The 15 diseases did not include polio. In 1949 when the Bureau’s members first began collecting information for the reports, it’s likely that polio was not viewed as an overly important issue, and Bureau members didn’t have reporting procedures in place to collect information on the disease. Data on polio wasn’t included until the following multi-year summary for 1954-1957. Even then, data collection and reporting were highly inconsistent and incomplete and varied significantly across and within Member Nations. For example, polio wasn’t a notifiable disease in Brazil during this period of time and as a result polio incidence in the region didn’t include polio data from the second most populous country. In some countries, polio was only reported when it produced paralysis (only roughly 1% of all cases of polio), while in others, polio was reported anytime a person with visible polio-related symptoms sought care from a medical facility. In some countries in Latin America disease surveillance systems only included data from “reporting areas” (limited to urban centers or rural areas with permanent health facilities), and thus polio incidence beyond these areas was unknown. In general, surveillance and data collection were both intimately linked to broader health system capacity and severely limited by the limited scope of health systems, especially in rural areas.

In spite of the weaknesses in domestic surveillance capacity in most countries in the Americas during this period, increasingly frequent and severe epidemics were evidence enough

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The need for epidemiological surveillance as a vital component of the overall health system was just beginning to gain traction in most countries worldwide in the 1940s and 1950s.
that polio was no longer regarded as a disease of the more advanced industrialized world. In 1951 Mexico reported more cases of polio than any other time since 1937 when polio became a notifiable disease in the country. In 1952 polio epidemics were reported in Chile, Cuba, Guatemala, Peru, and Venezuela. In 1953-1954 polio epidemics occurred in Argentina, Brazil, Costa Rica, Cuba, Jamaica, Nicaragua, and Uruguay. Polio was becoming an increasingly important problem in the Americas. The epidemiological transition related to polio in Latin America produced a need among Latin American public health officials for a new innovation to address the problem.

Centralized versus Decentralized Diffusion Models: The Case of Polio Vaccines and their Diffusion

The following sections use the diffusion of the two different polio vaccines in the Americas as a way to examine the extent to which the two different ideal-type diffusion models (centralized vs. decentralized) outlined by Everett Rogers actually fit the empirical reality on the ground in the Americas. The primary differences between centralized and decentralized systems include: the origins of innovations, the direction of diffusion, the extent to which the needs of potential “users” of an innovation are influential in driving the diffusion process, and the amount of reinvention of the original innovation that occurs throughout the diffusion and implementation processes. In Rogers’ ideal-type centralized system, innovations are developed by technical

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28 Poliovirus circulating freely within a community with poor sanitation services exposes young children to the virus and much more often than not produces naturally acquired immunity. The irony is that as sanitation services improve, poliovirus circulates less freely, and people (especially children) are no longer exposed to the virus naturally and thus no longer acquire immunity in the absence of vaccination. Part of the increase in polio incidence and the appearance of outbreaks in the Americas was related to improvements in sanitation and sewerage services that reduced the natural circulation of poliovirus. This was combined with improvements in disease reporting systems in countries throughout the Americas. Accordingly, some of the increase is based on actual epidemiological changes in disease incidence and some of the increase is based on stronger disease reporting systems in the Americas.
experts and formal R&D and then diffused in a top-down pattern from developers to users of the innovation. The diffusion process is largely innovation-driven (driven by the existence of an innovation) rather than driven by the needs of potential adopters. The perspective in a centralized model is that the innovation exists in its final state at the time of diffusion and thus reinvention or adaptation of the innovation is not encouraged or expected.

In contrast, in Rogers’ decentralized ideal-type, innovations frequently “bubble up” from experimentation of users within a given system rather than formal R&D done by experts who are not potential users of the innovation. In a decentralized model users of the innovation learn from one another in a peer-to-peer exchange of information and observed experiences in a more horizontal diffusion pattern. The needs of potential adopters drive the diffusion process rather than the existence of the innovation and a significant amount of reinvention and adaptation of the original innovation is expected to occur throughout the diffusion process.

A potential weakness of centralized systems is that, due to the pro-innovation bias and top-down diffusion pattern, innovations may be diffused that do not account for, or address, the needs of potential adopters of the innovation. When the adopting unit is a country, innovations that diffuse within a purely centralized system, may be poorly suited to meet the needs or local contexts of adopting communities. A potential weakness of purely decentralized systems concerns the lack of expert oversight or coordination, which can result in ineffective adaptations of an innovation or constrain the effective generation and circulation of innovation-evaluation information among members of a social system. In the following sections I use the case of polio vaccine diffusion as an empirical test of these two ideal-type models to examine the extent to which one of the two models is a better fit given the existing historical evidence.
In 1954 the National Foundation for Infantile Paralysis sponsored the Third International Polio Conference in Rome. While Latin Americans had participated in the two previous conferences organized in 1948 and 1951, Latin American participation spiked at the 1954 conference. Official delegations were sent from Argentina, Brazil, Chile, Costa Rica, Colombia, Cuba, the Dominican Republic, Guatemala, Uruguay, and Venezuela. Part of the reason for the spike in attendance was undoubtedly due to the fact that by the end of 1953 the National Foundation had determined that the world’s first polio vaccine developed by the Foundation’s own Dr. Jonas E. Salk, was ready for field trials.

The inactive or “killed” Salk vaccine field trials of 1954 involved almost two million elementary school children (called “polio pioneers”) across the United States. According to David Oshinsky, “Nothing like this had ever been tried before. There were no precedents to follow, no corporate donations to be tapped, no federal assistance. This was virgin territory, the biggest medical gamble in history. The National Foundation for Infantile Paralysis was completely-some thought distressingly - on its own.” Oshinsky continues, “with little government support or oversight, the National Foundation conducted the largest medical experiment in American history.”

The highly anticipated results of the 1954 Salk vaccine field trials were presented to the public in a press conference at the University of Michigan on the morning of April 12, 1955. Copies of the so-called “Francis Report” (named after Dr. Thomas Francis who was in charge of the trials and their evaluation) were given to the 150 reporters present at the press conference just after 9:00am. At 9:20am NBC’s the Today show announced to millions of viewers: “The vaccine

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30 Ibid., 189.
31 Ibid., 6.
32 Not coincidentally on the tenth anniversary of the death of America’s most famous polio victim, former president Franklin Roosevelt.
works…It is safe, effective, and potent.”

Ten days later during a Rose Garden ceremony on the White House lawn, President Eisenhower anointed Jonas Salk a “benefactor of mankind,” expressing the gratitude of “164,000,000 Americans and all the people of the world.”

Oshinsky writes, “In the cold war crusade against communism, Salk’s propaganda value was immense. Medical breakthroughs like this one showed the scientific prowess of the United States and the generosity of its spirit. The polio vaccine would benefit children everywhere. It was America’s gift to the world.”

The news coverage of the Salk vaccine in the popular press in the United States and abroad was more enthusiastic than it was accurate. The results of the field trials reported by Dr. Francis indicated that the Salk vaccine was 60-70% effective against Type I virus (the most commonly associated with paralytic polio) and 90% effective against Types II and III. These more modest results were not what the popular media reported thanks in part to Jonas Salk who addressed members of the press immediately following Dr. Francis (who was also Salk’s longtime mentor at the University of Michigan). According to Dr. Salk, he had made significant progress in improving his vaccine during the previous year since the field trials had begun. He claimed that while the vaccine tested in the field trials may only have been 60-70% effective, his new and improved (and untested) vaccine and vaccination procedures, could (in theory), “lead to 100 percent protection from paralysis of all those vaccinated.”

The promise of 100% protection against polio was what the newspapers reported instead of the 60-70% protection proven by 1954 field trials. Discrepancies aside, the Salk vaccine was

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34 “President Congratulates Dr. Salk as 'a Benefactor of Mankind',” *Special to the New York Times*, April 22, 1955.
36 Ibid., 204; Press Release on Francis Report at University of Michigan, April 12, 1955. Accessed at: [http://www.sph.umich.edu/about/polioannouncement.html](http://www.sph.umich.edu/about/polioannouncement.html)
approved and licensed for use by authorities in the United States only a few hours after the results of the vaccine’s first and only field trials were released.\textsuperscript{38} Twenty-four hours later President Eisenhower directed State Department officials to distribute copies of the Francis Report and information regarding production procedures for the Salk vaccine to countries worldwide. The gatekeepers in the United States had made their decision: the Salk vaccine was ready for diffusion.

The Cutter Incident: A Consequence of Centralized Innovation Diffusion?

Innovation gatekeeping involves controlling and deciding whether or not an innovation is ready to be diffused. Everett Rogers writes that, “One of the most crucial choices in the entire innovation-development process is the decision to begin diffusing an innovation to potential adopters.”\textsuperscript{39} This “most crucial” choice was made in the United States less than 24 hours after the Francis Report on the first and only Salk vaccine field trials was released. Offit explains that prior to 1955, total control over the research, development, and testing of the Salk vaccine had been concentrated in a single entity: the National Foundation.\textsuperscript{40} David Oshinsky similarly explains that National Foundation director Basil O’Connor viewed polio as the “exclusive territory of the foundation,” fiercely opposing what he viewed as “outside interference.”\textsuperscript{41} According to Oshinsky, O’Connor especially opposed interference by the government and warned that, “It would ensnare the polio crusade in a web of red tape and ‘socialist thinking.’”\textsuperscript{42} The Foundation backed up its territory claims with enormous amounts of funding. In 1953 (the

\textsuperscript{38} Oshinsky, \textit{Polio: An American Story}, 206-07.
\textsuperscript{39} Rogers, \textit{Diffusion of Innovations}, 155.
\textsuperscript{40} Paul Offit, \textit{The Cutter Incident : How America's First Polio Vaccine Led to Today's Growing Vaccine Crisis} (New Haven CT: Yale University Press, 2005), 59.
\textsuperscript{41} Oshinsky, \textit{Polio: An American Story}, 189.
\textsuperscript{42} Basil O’Connor is quoted in Oshinsky, 189.
year before the Salk vaccine field trials began) the United States National Institutes of Health spent less than $75,000 on polio research. That same year, the National Foundation spent roughly $2 million.\textsuperscript{43} Oshinsky writes, “So relentless was its [the Foundation’s] message, so powerful was its voice, that others did step aside, leaving the foundation free to pursue its crusade as it, alone, saw fit.”\textsuperscript{44}

According to a 1955 World Health Organization expert advisory committee report on the Salk vaccine, “Probably never in the history of medicine has a new public health measure been applied so rapidly on a mass scale.” The report continues, “It was almost inevitable, therefore, that this transition should be attended by serious difficulties.”\textsuperscript{45} The first in a series of “serious difficulties” linked to the Salk vaccine was reported just a few weeks after the vaccine was licensed. On the morning of April 24, 1955, a physician in Pocatello, Idaho made a phone call to a U.S. Public Health Service representative to report a case of paralytic polio in one of his young patients who had recently been vaccinated with the Salk vaccine.\textsuperscript{46} In and of itself this report was not cause for alarm. There had been a number of children who participated in the Salk vaccine field trials in 1954 who had subsequently come down with polio. In some cases children were vaccinated after having already been infected by the virus and in others, vaccination with the Salk vaccine hadn’t produced sufficient immunity. Oshinsky writes, “No one claimed that the Salk vaccine was perfect, but most everyone assumed it was safe - it couldn’t cause polio.”\textsuperscript{47}

Unfortunately, the case reported on April 24, 1955, was not unique. Something had gone wrong during the deactivation process required to produce the inactive Salk vaccine.

\textsuperscript{43} Oshinsky, \textit{Polio: An American Story}, 189.
\textsuperscript{44} Ibid.
\textsuperscript{46} \textit{Polio: An American Story}, 221-22.
\textsuperscript{47} Ibid., 221.
Contaminated lots of the vaccine containing live poliovirus had been released to the public and tens of thousands of children had been vaccinated with it. Ultimately, 204 cases of polio were associated with the vaccine. Seventy-five percent of the vaccine-associated cases resulted in severe paralysis and eleven people died.\textsuperscript{48}

Human casualties were not the only consequences of the “Cutter Incident,” named by Dr. Alexander Langmuir, Chief of the Communicable Disease Center in Atlanta, Georgia, after the Cutter Laboratories where the contaminated vaccine was produced. One of the most immediate and influential consequences was a drop in support for the Salk vaccine both within the United States and abroad. Use of the vaccine was temporarily suspended in the United States at the end of the first week of May of 1955 and was quickly followed by the suspension of polio vaccination programs in other countries that had been quick to adopt the vaccine.\textsuperscript{49} Although use of the Salk vaccine resumed relatively quickly in the United States after extensive investigations had been carried out and determined its safety, the fear and uncertainty created by the Cutter Incident both domestically and internationally was profound and had a range of consequences for the subsequent innovation-diffusion process linked to the vaccine. For example, in Mexico, where lots of the Cutter-produced vaccine had already been distributed and with other lots used in states like Arizona and California on the U.S.-Mexico border, further shipments of the Salk vaccine from the United States were temporarily suspended. Additionally, when Mexican public health officials began producing their own inactive polio vaccine in 1955, the attenuated poliovirus strains they used were from Dr. Albert Sabin, and not Jonas Salk.\textsuperscript{50}

In addition to the direct effects of the Cutter Incident on domestic adoption and implementation decisions, the Cutter Incident and surrounding polio-vaccine-related drama, also influenced a series of developments within international organizations including the Pan American Sanitary Bureau. There was a broad sense within the international health community that the innovation development and subsequent diffusion process linked to the Salk vaccine had been hyper-centralized and controlled by the National Foundation for Infantile Paralysis without any oversight from the U.S. government or any other monitoring body, nor the participation of external experts or advisors from beyond the United States.

Prior to the launch of the field trials a number of the world’s leading scientists had expressed their concerns about the trials but their concerns had largely fallen on deaf ears. Dr. Albert Sabin (who was actively working to develop his own alternative live oral polio vaccine during this period) went on record testifying before the United States Congress in 1953 stating, “I, for one, would strongly oppose large-scale tests of tens of thousands or hundreds of thousands of children based on the work of any one investigator.” Sabin again expressed his concerns about the Salk vaccine trials in March of 1954 before they began saying, “We are not at the end of the road [to control] but only at the beginning. Let us not confuse justifiable optimism with achievement.” Sabin explained, “Poliomyelitis has been with us a long time and produces serious disease in only a small proportion of the population. In my opinion, therefore, these promising studies should proceed as rapidly as possible, but without undue haste in attempting to transfer them or apply them to millions of human beings.”

Along with Dr. Sabin, Dr. Sven Gard, a highly respected Swedish virologist and a member of the Nobel committee that awarded the Nobel Prize to Drs. Enders, Weller and

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51 Sabin is quoted in Offit, The Cutter Incident, 128.
Robbins for their work on polio in 1954, had expressed serious misgivings about the vaccine’s safety at the Third International Polio Congress hosted by the National Foundation in Rome in September of 1954. An inactive polio vaccine was only safe if the poliovirus it was made of was effectively inactivated during the production process. Jonas Salk claimed this could be accomplished in nine days. After listening to Dr. Salk’s presentation at the 1954 conference, Dr. Gard shared the findings of his own research team with the international audience. Gard and his colleagues at the highly respected Karolinska Institute in Stockholm had been unable to duplicate Salk’s results. Instead of the nine days claimed by Salk, they found that it took as many as twelve weeks to safely deactivate a live poliovirus. Gard’s findings were too late. Paul Offit writes, “While Sven Gard was warning researchers in Rome of a possible problem with Salk’s inactivation methods, four hundred thousand American children were receiving Salk’s vaccine.”

The fallout from the Cutter Incident served as a sort of critical juncture in the history of clinical trials and government regulation of biologicals in the United States. The launch of the innovation diffusion process concerning biomedical interventions in the United States would rarely, if ever, again proceed with so little oversight or consensus among members of the scientific community and government officials.

Innovation Evaluation & the Pan American Sanitary Bureau

The following section provides a brief history of the Pan American Sanitary Bureau (renamed the Pan American Health Organization in 1958) and examines the evolution of Pan American Sanitary Bureau’s role concerning the evaluation and circulation of information on new public

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53 Jonas Salk’s “straight-line theory” of the poliovirus deactivation process was highly criticized and ultimately disproved by a number of scientists.

54 Offit, The Cutter Incident, 43.
health innovations. More specifically, how the Bureau essentially challenged the highly centralized diffusion associated with the Salk vaccine. This section illustrates that in spite of the highly centralized and top-down diffusion related to the Salk vaccine, the Bureau helped to slow the innovation diffusion process by providing a range of innovation evaluation information to policymakers within PASB Member Nations.

In Everett Rogers’ ideal-type centralized diffusion system innovations are generated by technical experts within formal R&D organizations and then diffused in a top-down and more linear fashion from the innovators to the potential users of an innovation. Rogers suggests that in a centralized system there is, “An innovation-centered approach; technology push, emphasizing needs created by the availability of the innovation.” This “pro-innovation bias” begins with the assumption that an innovation should be diffused and diffused as quickly as possible. Rogers explains that the pro-innovation bias common in many contemporary diffusion studies frequently leads researchers to “underemphasize the rejection or discontinuance of innovations, to overlook re-invention, and to fail to study anti-diffusion programs designed to prevent the diffusion of ‘bad’ innovations.”

One of the key developments linked to polio vaccines within the Pan American Sanitary Bureau (PASB or the Bureau) was that, starting in the mid-1950s the Bureau began strengthening its advisory and information-evaluation functions related to new innovations in public health. The Bureau in many ways took on the role of “innovation gatekeeper” for the Region of the Americas, generating and circulating a range of evaluative information related to new innovations (including but not limited to the Salk and subsequently, live oral polio vaccines) to its Member Nations which included the majority (and ultimately all) the countries in the

55 Rogers, Diffusion of Innovations, 396.
56 Rogers, Diffusion of Innovations, KL2116-2118.
Americas. During this period of time, these functions were particularly valuable based on the limited domestic capacity of most Member Nations to conduct these sorts of intensive innovation evaluations totally in-house. The following section highlights several key ways in which the Bureau influenced innovation diffusion decisions linked to the Salk vaccine between 1955, the year the vaccine first became available, and 1957, the year when the WHO (and PASB) endorsed field trials for an alternative live oral polio vaccine.

The Pan American Sanitary Bureau is the oldest international health organization still in existence today. It was established in 1902 and has gradually expanded to include every country and territory in the Americas. The primary governing documents of the Bureau included the Pan American Sanitary Code drafted in 1924 and still in force today, and the Constitution drafted in 1947. Prior to 1947 every director of the Bureau was a sitting U.S. Surgeon General and the majority of the funding and staff for the Bureau came from the United States. However, starting in 1947 with the directorship of Dr. Fred Soper (a Rockefeller Foundation employee and never a U.S. government official), the Bureau was increasingly “Latin Americanized” and increasingly driven by and responsive to the health priorities and needs of its Latin American Member Nations.57

The primary role of the Bureau throughout its history has been to facilitate the circulation of information on health in the region among all Member Nations including information on new innovations used to combat diseases and other health issues in the region. When the establishment of the World Health Organization (WHO) was first discussed in 1945 it was thought that the PASB would cease to exist and be folded in to the larger international organization. This assumption was neither shared nor accepted by the majority of the Bureau’s

members leading to a tense negotiation period whereby it was agreed that the PASB would take on an additional function by serving as the Regional Office of the newly established WHO starting in 1948. However, the PASB would retain its autonomy and continue to operate according to its own well-established principles and procedures. One of these key principles was that the Bureau’s primary obligation was to facilitate regional cooperation to solve public health problems in the region as identified by the Bureau’s members, rather than actors or institutions beyond the region of the Americas. To use Everett Rogers’ terminology, the Bureau was essentially a user-driven but centrally coordinated diffusion system, with the countries of the Americas as the members of the social system within which the diffusion model operated. The Bureau’s principles and operating procedures are examined in the following sections as they relate to the diffusion of the two alternative polio vaccines.

In contrast to the pro-innovation bias outlined at the beginning of this section, a more problem-centered approach was reflected in the Bureau’s conservative position on the Salk vaccine and the range of centralized functions the Bureau provided to Member Nations shortly after the vaccine’s introduction in 1955. The Bureau’s Annual Report for 1955 acknowledged the introduction of the Salk vaccine as “the most important development of the year in this field.” However, while acknowledging the obvious importance of the world’s first polio vaccine and serving as a clearinghouse for new information linked to its production and practical application, the Bureau proceeded with considerable caution in terms of making recommendations for its adoption and widespread use in the region.

The 1955 report explained that the announcement of the Salk vaccine trials aroused great interest among public health officials in the region who quickly requested information from the Bureau. The subsequent announcements surrounding the Cutter Incident only increased the

number of inquiries coming into the Bureau from countries throughout the region requesting to be kept informed about the situation. At the end of November 1955, the WHO convened a committee of international experts in an effort to mitigate some of the uncertainty surrounding the Salk vaccine and its proper production and use. The expert committee’s 1955 report opened by stating, “News of the accidents following use of the vaccine in the USA led to considerable confusion both among the general public and among health authorities, who were not fully aware of the many problems still remaining to be solved.”

The report explained that news about the Salk vaccine spread to countries throughout the world extremely rapidly thanks to the unprecedented publicity surrounding the release of the Francis Report in the United States on April 12, 1955. In many countries sound bites of information about the Salk vaccine reached the general public through the popular press before detailed scientific information reached scientists and public health officials. The report explained that, “Many health authorities were therefore at once subjected to heavy pressure of public opinion to apply the new control measure at the earliest possible moment.” The vaccine was actively promoted by actors within the United States, especially linked to the National Foundation for Infantile Paralysis, and adopted in some cases before health officials had sufficient information about how to use it effectively. This sort of top-down transfer process didn’t leave room for discussions about the suitability of the vaccine in many countries, or the extent to which the vaccine would effectively meet the needs, both administrative and epidemiological, of developing countries.

While the overall opinion of the WHO’s Expert Committee at the end of 1955 was that the Salk vaccine had been proven safe and effective in industrialized countries, the committee

60 Ibid., 3-4.
61 Ibid., 4.
identified a number of important issues that would have to be resolved before the vaccine was suitable for more widespread use based on the different epidemiological conditions found in many developing countries. For example, the 1954 Salk vaccine field trials had demonstrated the effectiveness of the vaccine only “under certain conditions in school-children between the ages of 6 and 10 years.”62 The committee cautioned that there was still insufficient information regarding the effectiveness of the Salk vaccine in other age groups and that information was “especially needed regarding very young children.”63 While insufficient information was available about the actual age distribution of polio in most developing countries, what was known was that in the majority of tropical and subtropical countries polio primarily afflicted children under the age of five, and therefore beyond the realm of the Salk vaccine field trial results.

The committee emphasized that practical and operational knowledge about the Salk vaccine was also extremely limited and even very basic questions regarding its proper use were unresolved. For example, how many doses of the Salk vaccine were required to produce sufficient immunity and how long would the immunity produced last? It was widely believed that booster shots would be required at some point, but after how long and then administered at what intervals? Could the vaccine be used in the face of an impending epidemic or as an emergency measure to halt an epidemic already underway? In countries where natural circulation of poliovirus was thought to provide immunity for young children, how would introducing the Salk vaccine to some but not all of the population and thus decreasing the amount of virus shed and circulating, affect naturally acquired immunity of subsequent cohorts?

62 Ibid., 25.
63 Ibid.
The questions raised by the WHO report and subsequent PASB documents pointed out that the Salk vaccine was not necessarily compatible with the needs of countries beyond the industrialized world based on different epidemiological profiles of polio in different countries and under different local conditions. The report advised public health officials in countries considering mass vaccination campaigns with the Salk vaccine that, “a decision to vaccinate should only be made after a careful review of many other factors.” Essentially, the report was advising domestic public health officials to make a “careful review” of domestic conditions that would likely affect the effectiveness of the Salk vaccine. The only thing that the expert committee was certain of was that the vaccine was effective in a limited sample population including more advanced industrialized countries with well-developed health infrastructures and seasonal polio epidemics where polio was most common in children over the age of five years old. The extent to which the Salk vaccine would be effective under different domestic administrative and epidemiological conditions was virtually unknown at the end of 1955.

Beyond providing innovation evaluation information about the possible effectiveness of the vaccine under different epidemiological conditions found in many countries in Latin America, the Bureau also provided information about several practical aspects related to the Salk vaccine, especially related to its high cost. Shortly after the vaccine was introduced, Bureau officials at the Headquarters office in Washington, DC, conducted a preliminary cost-benefit analysis of using the Salk vaccine in different countries with different incidences of paralytic polio. The findings were then published as part of a special Bureau report on the Salk vaccine in June of 1955. The Bureau reported that in countries with low or median incidence of the disease, it could cost anywhere from $3,000 to $10,000 in vaccine alone to prevent a single case of

64 Ibid., 31.
paralytic polio. Accordingly, the Annual Report for 1955 expressed a “serious doubt” concerning the “wisdom of urging countries with limited resources and other urgent health problems to devote as large a share of available monies to poliomyelitis alone.”

Beyond the scientific evidence against it, there was another significant factor influencing the adoption of the Salk vaccine in the Americas: the world’s leading producer of the vaccine (the United States) would not readily export it to other countries. Beyond the high cost of the Salk vaccine, for countries lacking domestic vaccine production facilities (every country in Latin America but Mexico as of 1955), it was difficult to procure sufficient quantities of the vaccine. Within hours of President Eisenhower’s directive to the State Department to distribute information on the Salk vaccine internationally, the Commerce Department had placed export controls on the vaccine that were to remain in place until U.S. manufacturers had produced sufficient supplies of the vaccine to meet domestic demands. Each country that wanted to purchase the vaccine from the United States had to apply for an individual license from the Commerce Department until April of 1958 when export controls for the Western Hemisphere were eased and a “general license” for Salk vaccine purchases was issued. In sum, the position of the Pan American Sanitary Bureau was that the inactive Salk vaccine was too expensive, poorly suited to meet either the epidemiological or administrative needs of Latin American countries, and had limited potential to effectively control polio in the region.

66 Ibid.
67 Bess Furman, “75 Nations to Get Vaccine Reports,” Special to the New York Times, April 14, 1955, pg. 21
Pan American Problem Solving and User-Driven Innovation Generation:  
The Live Polio Vaccines Trials (1957-1960)

The following section examines how the Pan American Sanitary Bureau facilitated the development and diffusion of an alternative to the Salk vaccine that was more in-line with the specific needs of PASB Member Nations and more actively involved Member Nations throughout the entire process. Coincident with its more active role in facilitating innovation diffusion processes in the Americas, the Pan American Sanitary Bureau similarly became more actively engaged in the innovation development process during the 1950s. The foundation for the Bureau’s increased activity in these areas was clearly authorized by the Pan American Sanitary Code adopted unanimously by the Bureau’s Members in 1924.

Article 56 of the 1924 Code stated that the Bureau was obligated to supply authorities from all Member Nations with “all available information relative to the actual status of the communicable disease of man, new invasions of such diseases, the sanitary measures undertaken, and the progress effected in the control or eradication of such diseases” in addition to providing information on “new methods for combating disease.” Article 56 continues that, “In order to more efficiently discharge its functions, it [the Bureau] may undertake cooperative epidemiological and other studies; may employ at headquarters and elsewhere experts for this purpose; may stimulate and facilitate scientific researches and the practical application of the results therefrom.” Article 56 therefore provided the foundation for the Bureau’s evaluation of public health interventions involving the inactive Salk vaccine and the subsequent collaborative research efforts related to the alternative live poliovirus vaccines between 1957 and 1960, which are examined in the following sections.

In 1956 the Bureau estimated that, as many as 11 countries and 9 other “areas” in the region had adopted the Salk vaccine; however among those that had adopted the vaccine, most were using it on a very limited bases or its use was largely restricted to private care providers. There were very few examples among the adopting countries (or “previous adopters”) of successful or sustainable implementation of the Salk vaccine within domestic immunization programs. As a result of the accumulated experiences of Latin American countries and new information circulated regarding the Salk vaccine, by 1957 the Bureau’s official position was clear: the Salk vaccine was not a viable alternative for the countries of the Americas.

The Annual Report for 1957 explained that while the inactive Salk vaccine had proven effective in a large portion of fully vaccinated individuals, the length of immunity produced appeared to be limited. It is important to note that “fully vaccinated” meant administering three different doses of the Salk vaccine spaced two months apart followed by a booster dose a year later. Based on significant limitations of domestic health system capacity in the vast majority of Latin American countries in the late 1950s, it would have been practically impossible to ensure that a majority of susceptible children were fully vaccinated with the Salk vaccine during this period. Moreover, continued outbreaks of polio in more advanced industrialized countries like the United States and Canada in the late 1950s, suggested that even with more sophisticated health care infrastructure the Salk vaccine was far from an ideal solution.

In addition to administrative difficulties, the Bureau reported that the Salk vaccine did not prevent the multiplication of poliovirus in the intestinal tract. As a result, the Salk vaccine would not interfere with naturally occurring dissemination of the virus that posed one of the largest problems in tropical and subtropical climates and developing countries with less developed
sanitation systems. In other words, the Salk vaccine didn’t address the bulk of the Latin American polio problem.

Based on the perceived shortcomings of the Salk vaccine the Bureau reported, “Great emphasis has been placed on the search for a live virus vaccine that may eliminate the above mentioned shortcomings of the ‘killed’ vaccine.” After explaining the way in which the live virus vaccines worked to produce immunity by mimicking naturally acquired immunity, the PASB report stated, “Also to be pointed out is the low cost of the attenuated vaccine, thus making it available for every public health service.” What PASB was arguing was that live oral polio vaccines would not only be better suited to meet the needs of potential adopters (public health officials in Latin American countries), but would also be available to all potential adopters based on its much lower cost as compared to the inactive Salk vaccine. This was explicitly addressing the needs of system users. Additionally, the recommendations made by the Bureau demonstrate that, in addition to scientific and epidemiological evidence, the Bureau was also urging countries to make decisions based on their own existing health system capacity and conditions.

The search for a live poliovirus vaccine gained the full support of the WHO and its regional bodies, including the Bureau, after the WHO’s Expert Committee on Poliomyelitis met for the second time in July of 1957. Based on the available information concerning attenuated live virus vaccines and associated laboratory studies indicating their safety thus far, the Committee strongly recommended that controlled field trials with the three different live poliovirus vaccines should be conducted without further delay. The three different live virus vaccines were developed by Herald Cox at the Lederle Laboratories in Pearl River New York,

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71 Ibid.
Albert Sabin at the University of Cincinnati, and Hilary Koprowski at the Wistar Institute in Philadelphia. The Committee explained that the large numbers of countries in which “mass application of an inactivated-virus vaccine is not feasible for many reasons” provided “sufficient justification” for initiating controlled field trials with the three different live poliovirus vaccines without further delay. The Americas and the Bureau were well positioned to play an extremely important role in the proposed studies thanks in part to overlapping polio networks linking the Bureau to key actors involved in live poliovirus vaccine research throughout the region.

The first live polio vaccine field trial involving the general population and including all three different types of poliovirus vaccines began in Minneapolis, Minnesota, in January of 1957, prior to the WHO’s endorsement. The study found that the antibody response generated by the live virus vaccine administered to infants in the study population compared favorably to responses produced by the Salk vaccine. Dr. Henry Bauer, Director of Medical Laboratories for the Minnesota Department of Health, directed the 1957 study. Bauer’s study collaborators included the University of Minnesota, and the Lederle Laboratories represented by Dr. Herald Cox who developed the Lederle-Cox live poliovirus vaccine strains that were used in the trials. The researcher representing the University of Minnesota was an assistant professor of pediatrics and immunology research associate from Brazil named Maurício Martins da Silva.

Dr. Maurício Martins da Silva studied at Yale University’s Medical School as an American Academy of Pediatrics fellow in 1945 before returning to Brazil and emerged as a leading figure in Brazilian pediatrics research. Martins da Silva’s polio link to the University of Minnesota started in 1954 when. That year, while working as head of the Third Pediatric Service

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in the São Zacharias Hospital of Rio de Janeiro, Martins da Silva began a collaborative field study comparing polio incidence in target populations in Rio de Janeiro and Minnesota with Dr. Jerome T. Syverton, Chair of the University of Minnesota’s Department of Bacteriology. Syverton was a senior figure in the field of virology, having studied under Dr. Peter Olitsky at the Rockefeller Institute of Medicine in the 1930s like other notables and live vaccine pioneers such as Albert Sabin and Herald Cox. Their collaborative study in Brazil was funded by a grant from the National Foundation for Infantile Paralysis.

In September of 1954, shortly after their fieldwork in Brazil was completed, Martins da Silva accepted a position (also funded by the National Foundation) as a research associate in bacteriology and immunology at the University of Minnesota where he worked alongside Jerome Syverton. Martins da Silva remained at the University until September of 1957 when he completed a Master’s degree in Public Health (graduating alongside future PAHO Secretary General Dr. Paul Ehrlich Jr.) at which point he joined the Pan American Sanitary Bureau in a newly established position as Polio Adviser for the entire region of the Americas.

The Bureau explained in its annual report that, thanks to the recent WHO endorsement of live vaccine trials in July of 1957, Bureau staff began talks concerning a possible collaboration with health officials in Minnesota linked to live vaccine studies. On January 21, 1958, Minnesota Governor Orville Freeman announced that larger-scale field trials with live polio vaccines had been approved and would be carried out in the following months by the Department of Health in collaboration with the University of Minnesota. These larger studies involved the Pan American Sanitary Bureau based on the preexisting connections of Martins da Silva who

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remained actively involved in the studies after joining the Bureau in 1957. Ultimately, not only were the needs of potential adopters of the vaccine beyond the advanced industrialized world factored in to the innovation development process, but Latin American actors and other researchers from the developing world, actively participated and were leaders in both the development and subsequent diffusion processes. The involvement of Latin American actors is discussed in the following sections.

Demonstration Effects, Actor Networks & Communities of Practice

The following sections illustrate the role that actor networks and key “change agents” or “policy entrepreneurs” played in facilitating the diffusion of the live oral polio vaccines in the Americas during the late 1950s. The sections are divided up to focus on two key actor networks linked to PASB Polio Advisor Dr. Maurício Martins da Silva, and live vaccine developer, Dr. Albert Sabin. The sections use technical reports from the Bureau, documents from Latin American ministries of health, newspaper archives, scientific publications, and archival documents from the Sabin Archives to trace the work of the two key actors and their networks, and the subsequent influence their efforts had on domestic policy adoption decisions and program developments.

Everett Rogers writes that, “Getting a new idea adopted, even when it has obvious advantages, is difficult. Many innovations require a lengthy period of many years from the time when they become available to the time when they are widely adopted. Therefore, a common

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problem for many individuals and organizations is how to speed up the rate of diffusion of an innovation.” Rogers explains that, “Methods to facilitate the trial of innovations such as the distribution to clients of free samples of a new idea, will speed up the rate of adoption.”

One of the ways that Pan American Sanitary Bureau facilitated diffusion of the live poliovirus vaccines was by brokering agreements between different parties linked to live vaccine research and field trials. The different parties each brought different resources and capabilities to the agreement, which made it possible to carry out programs in countries that would not have had the resources to conduct them otherwise. The *Quadrennial Report* for 1954-1957 explained, “The field testing of new products and methods is a natural field for coordination by the PASO/WHO, oftentimes bringing the worker with the product or method from one country to the country where needed conditions for field testing exist.”

Summarizing the Bureau’s functions concerning technical cooperation and capacity building, Dr. Myron Wegman, an internationally renowned pediatrics expert who was in charge of the Bureau’s Training and Education Division during the 1950s, explained that one “avenue of activity” of the Bureau was to facilitate technical cooperation with individual countries in order to bring “new techniques not readily available within their own boundaries” and in the process enable cross-national exchanges of information and experiences among health workers. Wegman made a critical point stating, “The real success of a truly effective program of technical cooperation comes, in essence, when the nationals of a country have become so adept in the new techniques that the external advisers are no longer needed and may move on.”

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76 Rogers, *Diffusion of Innovations*, 1.
77 Ibid., 177.
80 Ibid.
statement indicates the priority placed at the Bureau concerning domestic capacity building. In contrast to the more permanent nature of the centralized functions performed by the PASB, technical cooperation was meant to be temporary. The overall objective of the Bureau’s technical and advisory work was to help strengthen domestic capacity so that individual governments and not supranational organizations were the stewards of public health in their respective countries. Wegman summarized the Bureau’s approach to technical cooperation stating: “Put in current vernacular, there is no place for empire building.”

As a matter of principle and official policy, the Bureau would only participate in live polio vaccine field trials that had the full support and participation of national health authorities within the ministry of health. The Bureau’s Annual Report for 1954 stated, “The Bureau acts only on request and with the consent of the government of the country in which the work is done. In no instance does the Bureau promote parallel activities competing with health departments. The consultants provided by the Bureau work hand in hand with the health departments.” The Bureau would coordinate and supply advisors to assist with studies, broker agreements to secure adequate amounts of the vaccines, and assist in a number of other ways as deemed necessary by national governments.

Dr. Herald Cox and his colleagues at the Lederle Laboratories provided strains of the Lederle-Cox vaccines to be used in field trials at no cost to the host country. Cox and his colleagues at Lederle, along with scientists at the Yale Regional Polio Center (the WHO’s designated Regional Laboratory for the Americas under the direction of famed virologist Dr. John R. Paul), would then work with local scientists to conduct the necessary laboratory work required during the field trials. All of this was arranged under the auspices of national public

81 Ibid.
health officials who were actively engaged in every aspect of the field trials from their planning to their implementation and subsequent scale up. Dr. Albert Sabin similarly provided strains of his vaccine for Latin American field trials; however Dr. Sabin’s vaccine strains were used primarily in field trials in Mexico and Chile.  

Minnesota, Medellín, and Managua: Mapping Cross-National Innovation Diffusion with Maurício Martins da Silva

In 1950, the Bureau’s Annual Report stated:

The bridging of the gap which exists at any given time between the best available methods of combating disease in one place and the application of that knowledge for the benefit of mankind elsewhere, must ever be the responsibility of the international health agency. Such an agency must be sensitive to the discovery of new methods and techniques in any part of the world and be ready to facilitate their early application elsewhere.  

The Report continues, “Experience has shown that long term consultant service by a staff member of the Bureau, repeatedly visiting all countries in the region, bringing new ideas and new developments observed in other countries, is one of the most effective methods of bridging the gap.” This statement suggests that the Bureau explicitly conceptualized its mission as facilitating diffusion and knowledge translation. Additionally, the statement highlights one of the  

83 Conflicts early on between Dr. Sabin and Bureau Director Fred Soper made the Sabin strains less readily available during the initial field trials. Dr. Sabin insisted on exercising a significant amount of authority over the field trials preferring to work only with scientists of his choosing and to avoid dealing with national bureaucracies which in view would needlessly constrain the proposed research. In contrast, the official position of the PASB was that field studies involving the PASB could only be conducted with the full cooperation and participation of officials within the ministry of health in the country where the trials were to be conducted. The Bureau insisted on upholding the Bureau’s principles of national ownership and nationally-driven technical cooperation and thus would not work with Dr. Sabin if he refused to go through national officials and ministries of health. As a result, the Lederle-Cox live vaccine strains were used primarily in the Latin American field trials with the exception of early trials done in Mexico. An additional conflict that appears to have influenced the field trials with the Sabin strains was linked to the relationship between the WHO and the Bureau during this time. Dr. Sabin’s correspondence with Mexican, PASB, and WHO officials suggests that Dr. Sabin felt that the trials planned (in part by Dr. Sabin himself) in Mexico were the only trials planned in Latin America that aligned fully with the WHO’s recommendations issued by the WHO’s Expert Committee in 1957 (of which Dr. Sabin was also a member).  


85 Ibid.
Bureau’s central diffusion mechanisms: circulation of new knowledge through observations and direct advisory services provided by PASB staff. The following sections use the work of Polio Advisor Maurício Martins da Silva starting in 1958 to examine how the Bureau facilitated diffusion and how this particular gap-bridging diffusion mechanism operated. In addition to highlighting the role of transnational actor networks, this section demonstrates how geoepidemiological factors such as proximity, “neighborhood effects,” and the availability of “near-peer observations,” influenced polio vaccine diffusion in the Americas during the late 1950s.

Everett Rogers writes:

“Potential adopters of a new idea are aided in evaluating an innovation if they are able to observe it in use under conditions similar to their own. Such observation often occurs naturally, when one individual views another’s experience in using the innovation. Change agents may try to increase the observability of an innovation, and thus speed its rate of adoption, by organizing a demonstration of the innovation.”

The role of the change agent is akin to Donald Schöns “Johnny Appleseed” model whereby the innovation is brought to potential adopters. Starting in early 1958, with the assistance of Dr. Martins da Silva, the Pan American Sanitary Bureau began organizing a series of demonstrations involving the live polio vaccines in different countries in the Americas thus creating opportunities for near-peer observation. Ultimately, 11 Latin American countries hosted field trials for live poliovirus vaccines between March of 1958 and March of 1959. The first field studies in Minnesota, followed by studies in Colombia and Mexico, marked the onset of a wave of innovation diffusion linked to the live poliovirus vaccines.

In early January of 1958 a health center in the Andes municipality of Antioquia, Colombia, began reporting an unusually high number of paralytic polio cases. By March the

86 Rogers, *Diffusion of Innovations*, 389.
87 Argentina, British Guiana, Chile, Colombia, Costa Rica, Cuba, Haiti, Mexico, Nicaragua, Panama, and Uruguay.
situation had not improved leading health officials to request assistance from the Pan American Sanitary Bureau. Initially Colombian public health officials requested assistance to conduct an immunization campaign using the inactivated Salk vaccine; however a convergence of several factors contributed to a change in direction. Dr. Héctor Abad Gómez, Health Officer for Antioquia at the time of the outbreak, explained, “I knew that the Salk vaccine was good, and I asked for it. But, if I tried to protect the population of our state with such a measure, we would have had to expend the total budget of the Health Department, or even more, in that action.”

PASB director Fred Soper was visiting Colombia during this decision period and presented Dr. Abad Gómez with a possible solution to his problem: a live oral polio vaccine. Abad Gómez explained that the alternative offered by Dr. Soper was “an infinitely better vaccine…as shown in a group of Minnesota students and their children.”

The explicit mention of the Minnesota studies indicates the rapid circulation of the findings from these studies and their influence on domestic adoption decisions in other countries in the Americas in particular.

The decision to use the live polio vaccine was not taken lightly by Colombian officials. The live vaccines had not yet been widely used in larger studies involving larger numbers of people. Although existing studies were extremely promising, there were a number of questions concerning the vaccine that had not yet been answered. Dr. Abad Gómez explained that as a public health official he faced a basic choice: “either to do something to try to detain an ‘impending epidemic’ or to let a wild, bad, unexpected virus go ahead killing and paralyzing many children.”

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89 Ibid.
90 Ibid.
In their highly influential “Columbia University Drug Study” in 1966, Coleman et al. found that different communication channels (or diffusion mechanisms) were influential at different stages of innovation-decision process. While mass media or more general impersonal communication channels were sufficient to generate awareness about a new innovation across a wide range of potential adopters (doctors), Coleman et al. found that these mechanisms were not sufficient to convince most doctors to actually adopt the new drug. Instead, Everett Rogers explains that adoption decisions were heavily influenced by “subjective evaluations of the new drug based on the personal experiences” of near-peers in each doctor’s interpersonal network.\(^91\) Abad Gómez himself articulated the influence that his own interpersonal networks had on the Colombian adoption decision. He cited three “decisive factors” that influenced the decision to go ahead with the live vaccine trials.

He explained that the first was the visit of PASB Director Fred Soper “who gave us courage.” Abad Gómez had a preexisting professional connection to Soper having served as the Chief of the Bureau’s Maternal and Child Health Division in 1951 as one of Soper’s early Latin American recruits to the Bureau after Soper assumed the directorship in 1947. As a result, Abad Gómez became part of the Bureau’s expanding transnational (regional) actor network and community of Latin American public health experts.

The second decisive factor was a cable Dr. Abad Gómez received from Dr. Gaylord Anderson, founding Director of the University of Minnesota’s School of Public Health. In his cable Dr. Anderson expressed his confidence in the vaccine, its safety, and effectiveness. This demonstrates a personal or professional connection between Abad Gómez and Dr. Anderson who did consulting work in Latin America during this period. Dr. Anderson was also linked to Dr.

\(^{91}\) Rogers, *Diffusion of Innovations*, 68.
Maurício Martins da Silva through their collaborative work at the University of Minnesota during the 1950s.

The third factor influencing Dr. Abad Gómez’s decision was the “enthusiasm and vigor” of Dr. Martins da Silva who arrived in Antioquia to confer with local health officials on March 19, 1958. Abad Gómez was connected to Dr. Soper at the Bureau through his previous employment at the Bureau, connected to Dr. Anderson through Dr. Anderson’s consulting work in Latin America and indirectly through Dr. Maurício Martins da Silva, and connected to Martins da Silva through a collaborative agreement between Colombian health officials and the Pan American Sanitary Bureau.

Dr. Herald Cox and the Lederle Laboratories provided the vaccines needed for the campaign and laboratory support through an agreement brokered by the Bureau. Dr. Cox was connected to Dr. Martins da Silva through the original live poliovirus vaccine field trials with the Lederle-Cox vaccine conducted in Minnesota in 1957, in which both men had had leadership roles. Dr. Cox was also connected to public health officials in Colombia through one of his Lederle colleagues, who was a Colombian national currently working as a virologist at the Lederle Labs and who was actively involved in the Colombian field trials. Prior to joining the Lederle team, Dr. Manuel Roca García directed the Carlos Finlay Institute in Bogotá, Colombia where a live virus vaccine to combat yellow fever was produced under García’s leadership in 1951.

The live polio vaccine field studies conducted in Minnesota in January and February of 1958 with the Lederle-Cox vaccines had produced new and encouraging evidence that Martins da Silva then used as the basis for his recommendations to the Colombian health officials.

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Martins da Silva and Anderson both had personal experience using the live vaccine in field trials in Minnesota that arguably made their endorsements more influential for Colombian health officials. Ultimately, the vaccination strategy developed by local and national health officials in collaboration with the PASB, was based on recent experiences with the same live vaccines in Minnesota as well as technical guidelines provided by the WHO’s Expert Committee on Poliomyelitis regarding the field uses of the live vaccine in the face of an impending epidemic. The vaccination program began on May 5, 1958, with the support of local and national officials, PASB advisors, community and church leaders, and a virologist from the Lederle Laboratories.

While the vaccination campaign in Andes was getting underway, a sudden spike in paralytic polio cases in the Nicaraguan capital of Managua at the end of May sparked fears of an impending epidemic. The number of cases increased in the following months leading public health officials to request PASB assistance at the end of July of 1958. Maurício Martins da Silva arrived in early August to collaborate with Nicaraguan health authorities in developing a plan for mass vaccination. Doctor Miguel López Berrios, from the Ministry of Health in Managua reported, “A live attenuated poliovirus vaccine was selected on the basis of previous experience with this type of vaccine in Andes, Colombia, earlier in the year.” The statement made by López Berrios demonstrates unequivocally that near-peer observations and the experiences of previous adopters viewed to be “analytically equivalent” directly affected domestic adoption decisions in Nicaragua.

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93 Abad Gómez’s statements in ibid., 444.
94 Ibid., 445.
When Nicaragua first reported a possible polio epidemic, Nicaragua, like the majority of other countries in Latin America at the time, lacked the domestic laboratory capacity to conduct the diagnostic work that was required to develop an effective response. With three different types of poliovirus potentially responsible for the outbreak, laboratory confirmation was needed to determine which strain of live vaccine was required to combat the epidemic. In the absence of sufficient domestic capacity, Nicaraguan officials turned to the Bureau for additional assistance. Ultimately the Bureau helped to broker an agreement between the Nicaraguan Ministry of Health, the Lederle Laboratories and the WHO Regional Polio Laboratory at Yale. Maurício Martins da Silva worked with local public health officials to collect the blood and stool samples needed to determine which virus was responsible for the outbreak, which were then sent to the Lederle Laboratories in New York or to the Yale Polio Laboratory in Connecticut where the laboratory confirmations were done. This is an early example of the different types of cooperation the Bureau provided to Member Nations and one of the ways in which the Bureau and other external actors helped to mitigate weaknesses in domestic capacity in the region.

Dr. John R. Paul, founder of the Yale Polio Unit and head of the WHO’s Regional Polio Laboratory, visited Colombia in September of 1958. Paul’s visit came shortly after the launch of a scaled-up vaccination program covering the entire area surrounding the City of Medellín. Paul’s visit was part of an 11-nation Latin American tour linked to an international fellowship program sponsored by the U.S. National Institutes of Health. In a trip report marked “confidential” sent to live-vaccine developer Albert Sabin, Dr. Paul wrote, “Although questions concerning poliomyelitis represented a secondary issue on this trip, I was anxious to obtain what information I could which might assist the WHO’s ‘Poliomyelitis Laboratory of the Americas’ in

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its future planning, and its future work.” In his report Paul suggested that the field trials in Andes were serving as a sort of test case for other Latin American policymakers and were being closely followed by neighboring countries where polio immunization initiatives had not yet been adopted.

After visiting Colombia Dr. Paul traveled to Peru where he spoke with Dr. Joaquin Cornejo, an epidemiologist at the Peruvian Ministry of Health. Paul reported that, “The Ministry is keeping in close touch with developments under the auspices of the PASB with the Lederle live virus vaccine, which are now going on in Colombia.” “Peru,” Dr. Cornejo suspected, “will probably follow along with the Colombian decisions regarding its use.”

Paul’s trip report provides an additional source of information indicating the influence of geoepidemiological factors such as proximity, near-peer observations, and the decisions made in other countries within the same “neighborhood.” The statement made by Dr. Cornejo suggests that even in the absence of direct PASB assistance/involvement or formal demonstrations as in the case of Nicaragua, policymakers drew on the experiences of neighbors to inform policy adoption decisions. Rogers writes, “The trial of a new idea by a peer can substitute, at least in part, for the individual’s trial of an innovation, at least for some individuals and for some innovations. This ‘trial-by-others’ provides a vicarious trial for an individual.”

99 Ibid.
100 Ibid., 9.
101 Kurt Weyland (2006) discusses the influence of “neighborhood effects” on social policy adoption decisions in Latin America suggesting that decisions made in other nearby countries are more readily available and visible to domestic policy makers, than decisions made in countries that are further away.
102 Rogers, Diffusion of Innovations, 177.
Mexican Polio Vaccine Research: All Roads Lead to Sabin

In addition to the Johnny Appleseed diffusion model illustrated by Dr. Maurício Martins da Silva, “magnets” whereby different actors come to the same central place and are then exposed to new ideas or innovations, also contributed to polio-related diffusion in the Americas during the late 1950s. These “magnet models” contribute to diffusion in two key ways. First, actors are exposed to new ideas and innovations that they then can bring back with them to their home country or institution. Second, magnets can facilitate the development of actor networks that subsequently facilitate diffusion through established communications channels and exchanges of information among actors within the network (and also across different actor networks through “go betweens”). The following section examines the role of magnets, and the actor networks that emerged from them, in facilitating cross-national diffusion. Specifically, this section traces the personal and professional networks of Dr. Albert Sabin and his links to key Mexican actor networks.

One of the key “magnets” for polio-related research and innovation throughout the 1940s and 1950s was the Yale University Polio Unit and Yale School of Preventive Medicine. Yale emerged as one of the destinations of choice for Latin American medical researchers with key actors such as future PAHO Director Héctor Acuña, Chilean virologist Guillermo Contreras, and Mexican virologist Manual Ramos Alvarez all overlapping at Yale in the early 1950s. While at Yale, Latin American experts collaborated with leading U.S. experts in residence including: John R. Paul, Joseph Melnick, and Dorothy Horstmann. It was while visiting this magnet at Yale in 1954 that Dr. Albert Sabin met the man he would come to refer to as his “Mexican scientific son.”

103 Dr. Robert Chanock, a world-renowned virologist and former chief of the Laboratory of Infectious Diseases at the National Institute of Allergy and Infectious Diseases (NIAID) was Sabin’s original “scientific son.” In addition
Dr. Manuel Ramos Alvarez began his postgraduate studies at Yale University’s Department of Preventive Medicine in 1952 while on leave from his laboratory position at Mexico’s world renown Hospital Infantil. Ramos Alvarez’s work was largely focused on enteroviruses including, but not limited to, polio. While in residence at Yale, Ramos Alvarez studied with Drs. Joseph Melnick and John R. Paul, founder of the Yale Polio Unit in the 1930s. These connections were influential in later polio research and provided links between actor networks in the United States and Mexico. In 1953 when Ramos Alvarez was finishing up his studies at Yale, Dr. Sabin stopped by the department for a visit. The doctors began exchanging opinions about their work, which lead Dr. Sabin to invite Ramos Alvarez to come work with him in Sabin’s laboratory at the Children’s Hospital at the University of Cincinnati. Ramos Alvarez was quick to accept the offer. The two men reunited in Cincinnati in 1954 and began a series of studies that were to become some of the most widely cited studies in the early history of polio research.

Based on Mexico’s pre-existing domestic laboratory capacity (discussed in chapter three) and Sabin’s own personal networks in the country, Mexico seemed like an ideal place to begin expanded poliovirus studies in the mid-1950s. In a Letter to Mexican Minister of Health Dr. Ignacio Morones Prieto, Dr. Sabin made his argument in favor of the proposed poliovirus field studies in Mexico. Sabin explained that his collaborator in field studies currently underway in Cincinnati (that were similar to the studies proposed in Mexico) was “a brilliant and very

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104 The Hospital Infantil was established by presidential decree in 1943 under founding director Dr. Federico Gómez, one of Mexico’s foremost pediatrics experts. The Hospital Infantil was the first of a series of independent institutions established by presidential decree that provided an early foundation for the integration of research and policymaking in Mexico. The integration of research and policymaking continues to be a dominant theme throughout later Mexican case studies and is still a hallmark of Mexican health policy today.
industrious young Mexican physician, Dr. Manuel Ramos Alvarez, who received his training in Mexico City and recently came to work in the United States.” Sabin continued, “His knowledge of Mexico would greatly facilitate this comparative study in our two countries.” During this same period of time Dr. Sabin also collaborated on polio research with another Latin American Yale alumnus, Dr. Guillermo Contreras who directed Chile’s most prominent bacteriology laboratory in the 1950s and overlapped at Yale with Ramos Alvarez.

In 1957 Manuel Ramos Alvarez returned to Mexico and to his virus lab at the Hospital Infantíl in Mexico City. His return, combined with the base of support provided by Mexico’s newly established National Virology Institute, generated new opportunities for cross-national collaboration with key actors such as Dr. Sabin and also Ramos Alvarez’s former colleagues at Yale, including John R. Paul and Joseph Melnick. On March 29, 1957, Sabin wrote to Ramos Alvarez proposing the idea of conducting larger-scale field trials with the Sabin strains of the live polio vaccine in Mexico. Although the WHO had not yet endorsed the proposed studies, similar studies had been conducted with the Lederle-Cox vaccine strains in Minnesota, and all evidence suggested that the WHO’s endorsement would follow shortly (which it did in July of 1957).

Ramos Alvarez quickly responded to Sabin writing: “The experiments we plan to do with the living attenuated virus vaccine are known just for a few people; in other words, expect for yourself, Dr. Gómez, and myself and some people in the Public Health here in Mexico, nobody would know about it in Mexico until the results of the tests would come to light. I hope this is

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107 Expert Committee members at that point included key advocates for the live vaccines including Albert Sabin, Sven Gard, John R. Paul, and Joseph Melnick.
agreeable to you.”¹⁰⁸ The Dr. Gómez referred to in his letter was Dr. Federico Gómez founder of both the Mexican School of Pediatrics and the Hospital Infantil in 1943, that was Mexico’s first pediatrics hospital and independent Mexican medical research institute, and that housed Manuel Ramos Alvarez’s virus laboratory.

While the Salk vaccine was still used in domestic vaccination initiatives during this period of time in Mexico, the myriad issues surrounding more extensive use of the Salk vaccine in Mexico (and other developing countries) helped generate high levels of support for the live vaccine trials from Mexican public health officials within the Secretariat of Health and Welfare (SSA). Writing to Dr. Sabin at the end of 1957, Manuel Ramos Alvarez explained that the Mexican Minister of Health, Dr. Ignacio Morones Prieto, was “very interested” in the live polio vaccine project being developed by the two doctors and had approved the vaccination of an additional 5,000 children. At the time, Ramos Alvarez was uncertain about the extent to which the Secretariat would otherwise participate in the trials especially concerning the provision of funding.¹⁰⁹ In the absence of funding from the Secretariat, Ramos Alvarez had to look elsewhere for funding to support his studies. One source of funding came from his former professor at Yale, Dr. Joseph Melnick.

Dr. Melnick left Yale in 1957 to work at the National Institutes of Health before joining the faculty of Baylor College of Medicine as the head of the newly established Department of Virology and Epidemiology in 1958. In March of 1958 Dr. Melnick traveled to Mexico to observe the work being done by his former student in collaboration with Albert Sabin.¹¹⁰ Dr. Melnick, Dr. Matilde Benyesh-Melnick, and Ramos Alvarez ultimately collaborated on a series

of live vaccine field trials as a result of the 1958 visit. In addition to some basic laboratory support provided by Dr. Melnick, Dr. Sabin helped to secure additional funding for the Mexican studies and Ramos Alvarez’s lab from U.S. pharmaceutical companies such as Pfizer and Merck, Sharp, and Dohme.

The live field studies in Mexico received a significant boost thanks to overlapping Mexican actor networks and the high priority given to the live vaccine studies within the Secretariat of Health and Welfare. In 1958 Adolfo López Mateos was elected president of Mexico and appointed his former classmate, Dr. José Alvarez Amézquita to lead the Secretariat of Health and Welfare.111 Later that year Dr. Miguel E. Bustamante joined Dr. Alvarez Amézquita at the Secretariat providing another important source of support for the live vaccine trials and a direct link to the Pan American Sanitary Bureau. Bustamante received his PhD at Johns Hopkins University in the 1930s, was a leading figure in Mexican public health, and had been among the first key figures recruited by PASB Director Fred Soper (1947-1959) to work at the Bureau starting in 1947. Bustamante returned to Mexico after serving at the Bureau for over a decade to assume the position of Vice-Minister of Health in 1959. Ultimately, both Alvarez Amézquita and Bustamante actively participated in subsequent live vaccine studies and co-authored papers presented on the studies at international conferences on polio held in the late 1950s and early 1960s.

Another link within the Secretariat helped secure the necessary support for the first major field studies conducted in Mexico in 1959. Dr. Gustavo Baz was a national hero having risen to the rank of General under Emiliano Zapata during the Mexican Revolution. Baz was also one of

Mexico’s most well-respected medical figures of the 20th century. As Minister of Health (1940-1946) Baz donated his salary to maternal and child welfare centers and established Mexico’s rural medical service program requiring public service in under-served areas for medical school graduates. After a remarkable career in Mexico’s public health services, Baz went on to serve as Governor for the State of Mexico starting in 1957. While serving as Governor it was Dr. Baz who gave his full authorization and support for the first large-scale field studies conducted by Manuel Ramos Alvarez, Federico Gómez, and Albert Sabin in the City of Toluca Mexico in August of 1959. These studies became some of the most significant in the field of polio research during this period and were cited by a myriad scientists and public health officials as having influenced polio vaccination procedures adopted throughout the Americas.

In addition to helping to facilitate the live vaccine studies in Mexico, Dr. Sabin played a key role in helping to facilitate the cross-national circulation of information related to the live vaccine studies being conducted in Mexico as well as other countries where his vaccine strains were being tested. In April of 1957 when Sabin and Ramos Alvarez first began discussing the possible live vaccine studies in Mexico, Dr. Sabin had alerted Ramos Alvarez to the fact that at that time he was also sending strains of his vaccine and collaborating on similar studies with researchers in Holland, South Africa, the Soviet Union, and Italy. In a letter to Dr. Sabin confirming their agreement to proceed with the live vaccine studies in Mexico, Ramos Alvarez

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112 As leader in medical education at Mexico’s National Autonomous University (UNAM) in the 1930s, Baz established Mexico’s Social Service program for medical students requiring recent graduates to perform medical service in rural communities as part of their residencies.

113 The Secretariat of Health and Welfare was one of the many launching pads for Mexican political elites under the Institutional Revolutionary Party (PRI) throughout the PRI’s 70-year tenure in power in Mexico. Until 1982, with the appointment of Dr. Guillermo Soberón as Minister of Health, Health Ministers frequently went from the Secretariat into elected office, serving as PRI Governors for important states such as the State of Mexico.


115 Dr. Sabin’s collaborators included Dr. Verlinde in Holland, Dr. John Gear in South Africa, Dr. M.P. Chumakov in the USSR, and Dr. Giovanardi in Milan, Italy. Letter from Albert Sabin to Manuel Ramos Alvarez, April 18, 1957. ABS Archives, Series: OPV, 1952-1993, Sub: Studies, B18, F9 (Mexico).
wrote, “I feel sure the experience of each of the different laboratories when put together will be very useful.”

The results of studies conducted in other countries ultimately helped to inform the studies conducted in Mexico thanks in part to Dr. Sabin’s efforts to diffuse the newly generated information throughout his own personal and professional networks. In April of 1958 Dr. Sabin wrote to Ramos Alvarez with a series of updates from studies being conducted with his vaccine in Holland that had caused Dr. Sabin to revise some of his recommendations about the optimal dosage schedule. After summarizing the results from Holland Dr. Sabin concluded his letter writing, “You may wish to consider this in your own program.” Ramos Alvarez subsequently adjusted his own studies to reflect the new information.

Dr. Sabin also placed pressure on Manuel Ramos Alvarez to publish and circulate the new evidence generated by Ramos Alvarez’s own studies in Mexico. On July 7, 1958, Sabin wrote to Ramos Alvarez inquiring whether or not he had arranged to write up the preliminary results of his studies. “There are more and more people entering this field and I think a knowledge of your data would be helpful to everybody,” Dr. Sabin explained. “I cannot urge you strong enough to do this as soon as possible.” Dr. Sabin also encouraged his friend and colleague to attend the Tropical Medicine Congress in Lisbon being held the following month so that the two men could discuss future studies and Ramos Alvarez could disseminate his preliminary findings among their colleagues at the Congress.

The following year, after live vaccine studies had been expanded in Mexico, Dr. Sabin stepped up his efforts to encourage Ramos Alvarez to publish the findings of his studies in Mexico thus far. In a letter at the end of 1959 Dr. Sabin wrote:

I want to stress once again…it is extremely important that you arrange your time that you may be able to publish the results of your work. All the time and effort that you put in are of little value either to yourself or to everyone else unless and until you publish it in proper form so that the data may be available for independent analysis. Work without proper publication is of little scientific value.119

Ultimately, Ramos Alvarez did publish and circulate the results from the Mexican field studies. His subsequent publications became some of the most frequently cited studies in the field.

Centralized vs. Decentralized Diffusion:
Evidence from the Live Poliovirus Vaccine Conferences, 1959 & 1960

The papers presented and debates that took place at two international conferences on the live poliovirus vaccines hosted by WHO/PAHO in 1959 and 1960 shed light on the extent to which Everett Rogers’ ideal-type centralized and decentralized diffusion models explain the innovation diffusion of polio vaccines in the Americas during the second half of the 1950s. Ultimately this section demonstrates that neither ideal-type wholly explains the innovation diffusion patterns observed in the Americas and that the diffusion of both the inactive Salk vaccine and live oral polio vaccines combined characteristics of both models. This section begins by outlining Rogers’ ideal-type models and then uses the papers presented by Latin American actors and on field studies in Latin America, as well as the debates among actors present at the two conferences, to examine different key characteristics of the respective models as they relate to the observed patterns in Latin America.

One of the key differences between centralized and decentralized diffusion systems proposed by Rogers concerns the importance that the needs of potential adopters of an innovation play in driving the innovation diffusion process. In a centralized system the needs of potential adopters are relatively insignificant whereas in the ideal-type decentralized diffusion model, the needs of potential adopters are viewed as driving the innovation diffusion process. Potential live vaccine adopters in Latin America played an important role in driving both the innovation development and diffusion processes concerning the live poliovirus vaccines. Not only did Latin American actors seek out the advice and collaboration of the Bureau on live vaccine field trials, but they also pressured the WHO and the Bureau to facilitate the more rapid and widespread circulation of new information and evidence concerning the use of the live vaccines.

On March 9, 1959, Albert Sabin wrote a letter to Dr. Manuel Ramos Alvarez to inform him of a breaking development related to live polio vaccine studies. Sabin reported that he had recently met with Dr. Anthony M.M. Payne, the Chief of Virus Diseases at the WHO and discussed the current state of polio vaccine research. Dr. Sabin reported to Ramos Alvarez that an international meeting on the live poliovirus vaccines was being planned to take place in Washington, DC, in June of 1959. After his conversation with Dr. Payne, Sabin wrote, “Apparently this early date is the result of considerable pressure from Latin American governments to have such a meeting as early as possible at which the data on worldwide field trials and other related problems in connection with attenuated polioviruses may be presented and discussed.”

120 Letter from Albert Sabin to Manuel Ramos Alvarez, March 9, 1959. ABS Archives, Series: OPV, 1952-1993, Sub: Studies, B18, F9 (Mexico). In an interesting note, Dr. Payne, the Chief of Endemic Diseases at the WHO, was
In response to the needs expressed by potential Latin American adopters, in his final months as Director of the Pan American Sanitary Bureau, Dr. Fred Soper organized the First International Live Poliovirus Vaccine Conference. Myron Wegman, who worked under Soper at the Bureau during the 1950s, noted that the conference “brought together in a single forum experts from all over the world, juxtaposing sometimes violently opposing points of view.” Wegman explained that to Soper, this kind of knowledge exchange forum was “the breath of scientific advance and the quintessence of ‘building the health bridge.’”

In June of 1959, the Pan American Health Organization, with the financial support of the Minnesota-based Sister Elizabeth Kenny Foundation and support of the WHO, hosted the First International Conference on Live Poliovirus Vaccines. PAHO officials stated that the purpose of the conference was to enable “active workers in the field of live poliovirus vaccination to pool their experiences and provide means for dissemination of the information gathered.” A total of 61 scientists and public health officials from 17 different countries attended the 1959 conference (not including PAHO or WHO staff or their countries of origin). In response to those in attendance at the first conference the Second International Conference on Live Poliovirus Vaccines was organized the following year in June of 1960 that included 85 representatives from 20 countries.

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122 Ibid.
123 The Pan American Sanitary Bureau changed its name to PAHO at the end of 1958.
The Sources of Innovations and New Information

Dr. Albert Sabin, arguably the most outspoken advocate for the live vaccines, started his presentation at the first conference in 1959 stating, “The past year may truly be referred to as the international live poliovirus vaccine year, since never before have investigators from so many different parts of the world combined their efforts and facilities to obtain an answer to a question of international public health importance.” The statement made by Dr. Sabin demonstrates that the live polio vaccine development process was a highly collaborative and international endeavor with a variety of sources responsible for contributing to the development and testing of the innovation. Existing historical accounts of the live poliovirus vaccine development process largely ignore the participation of Latin American scientists and researchers as well as the leadership of the Pan American Sanitary Bureau in polio research and field studies during the late 1950s. An examination of the papers and studies presented at the 1959 and 1960 live vaccine conferences suggests an alternative history that involved the active participation of Latin American scientists and public health officials in both the production and circulation of new evidence surrounding the use of live poliovirus vaccines.

Of the total number of participants at the 1959 conference, roughly one-third were either from Latin America or were part of research teams conducting field studies in Latin America. Additionally, out of the total 37 papers presented in 1959, 15 were based on data from Latin American field studies or done by Latin American researchers. During the two conferences a total of 46 Latin American scientists and public health officials were represented as co-authors on papers presented. Papers were presented on field studies conducted in seven Latin American countries: Colombia, Costa Rica, Cuba, Haiti, Mexico, Nicaragua, and Uruguay. Almost every

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Latin American field study presented at both conferences involved a research team that included a minimum of one domestic public health official and one researcher from the country where the study was conducted, in addition to researchers from either the Pan American Sanitary Bureau or North American polio-networks or both. Over half of the Latin American field studies presented involved some sort of brokering done by the Bureau, whether arranging for laboratory work to be conducted at the WHO’s Regional Polio Laboratory at Yale, or brokering agreements between domestic public health officials and the Lederle Laboratories for the provision of vaccines. This suggests that Latin American actors were not simply relying on external expertise or evidence produced in the United States or other more advanced industrialized countries. On the contrary, much of the evidence presented at the two conferences was produced, in part, by Latin American experts based on Latin American field studies.

This combination of domestic expertise and external collaboration brokered by the Bureau or by other key actors such as Albert Sabin doesn’t fit neatly with either the decentralized or centralized ideal-types described by Everett Rogers. One of the primary distinctions Everett Rogers makes between centralized and decentralized diffusion systems concerns the source of innovations. In centralized systems innovations are thought to come from formal R&D that is conducted by technical subject-experts who are not also users, whereas in decentralized systems Rogers writes that, “Innovations come from experimentation by nonexperts, who often are users.”127 Neither one of these descriptions accurately describes the Latin American experience with live polio vaccine and immunization innovations. Some aspects of the process were still more or less centralized in that the research was clearly conducted by experts. However, the experts were often also “users” in that they came from ministries of health in developing

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127 Rogers, *Diffusion of Innovations*, 396.
countries where the innovations (the vaccines) were going to be used. In this way, experts were also often users, combining aspects of both centralized and decentralized diffusion models.

Who Decides Which Innovations Diffuse & How Important are User Needs in the Diffusion Process?

Another key distinction between centralized or top-down innovation diffusion models and their decentralized or more bottom-up counterparts, concerns who decides which innovations diffuse and when, and the extent to which the needs of potential users/adopters of an innovation influence the innovation diffusion process. The issue of who decides which innovations diffuse and when provoked heated debates among participants at both conferences. These debates featured representatives of the United States Public Health Service (USPHS) officials and a range of other key actors from the United States on one side, and participants primarily from developing countries and the Bureau on the other.

Regardless of whether or not Latin American public health officials chose to formally adopt the live vaccines, widespread use of the vaccines wasn’t possible without a licensed producer or continued free distributions of the vaccines, as had been the case during the initial field trials. Other than the Soviet Union, the United States was the only other obvious large-scale producer of the live vaccine at that point. However, officials within the United States had their reservations about the live vaccines, and by the end of the 1950s continued to oppose licensing the vaccines for domestic use or export.

During the closing session of the 1959 conference, immediately following presentations by the delegates from Colombia, Uruguay, and the Lederle Laboratories field studies in Latin America and the Caribbean, Dr. David Bodian a leading virologist from the United States and advisor to both the USPHS and the National Foundation for Infantile Paralysis, commented,
“Great progress has been made in the past year or two and the contributors are to be
congratulated upon their achievements.” Bodian continued that, in spite of the progress that had
been made there was still reason to delay approval of the live vaccine for wider use. Bodian
explained that those authorities (including himself) who might be perceived as “timid and
without faith” had a “special responsibility” compared to their colleagues in other countries
where vaccines were not produced for international distribution.128

Joseph Smadel, the Associate Director of the National Institutes of Health, echoed
Bodian’s comments. He reminded conference goers that “undue haste” had been partially
responsible for the Cutter Incident, involving contaminated lots of the Salk vaccine in 1955.129
Dr. Smadel went on to suggest, “Now that the problems connected with killed polio vaccine have
been solved and the Salk type preparation has come into wide use in the United States, we here
can afford the time required to iron out all the problems connected with commercial production
of live vaccine.”130 Although Smadel and Bodian’s statements reflected the need for greater
caution than had been exercised with the licensing and production of the Salk vaccine in 1955,
they did not sit well with several delegates present at the conference.

The inactive Salk vaccine had been licensed for production and use, and its diffusion
actively promoted by actors within the United States, only hours after the first and only field trial
of the vaccine had been conducted. Moreover, when the vaccine’s effectiveness when used under
conditions other than those found in the United States and other advanced industrialized nations
was largely unknown. There had been virtually no innovation gatekeeping in 1954-1955, due
primarily to the fact that the kind of regulatory institutions in place today (whose development

128 David Bodian’s comments during the closing session of the 1959 conference in “Live Poliovirus Vaccines:
Papers Presented and Discussions Held at the First International Conference on Live Poliovirus Vaccines,” 683.
129 Joseph Smadel’s comments during the closing session of the 1959 conference ibid., 685.
130 Joseph Smadel’s comments during the closing session of the 1959 conference ibid., 685-86.
was directly linked to the Cutter Incident and Salk vaccine drama) were nonexistent prior to 1955.\textsuperscript{131} Regardless, the Salk vaccine had been approved and diffused too quickly and now the live vaccines, and those countries where they were most needed, appeared to be suffering the consequences. Officials from the WHO and PAHO called the standards for the live vaccine required by the United States, “extremely exacting,” noting that if similar standards had been applied to either the Salk vaccine or other commonly used vaccines, these life-saving interventions wouldn’t have been available.\textsuperscript{132}

Dr. André Lebrun, who had conducted field trials in his native Belgian Congo, criticized the extreme caution being exercised by scientists like Bodian and Smadel. According to Lebrun, countries with more advanced health systems and easier access to the Salk vaccine were “reluctant” to conduct large-scale field trials of the live vaccines for themselves, yet quick to criticize, and even reject, the results generated by the countries that did. Dr. Lebrun responded to Drs. Bodian and Smadel stating:

I believe that everyone here is fully aware of the reasons for the prudence of the United States with respect to the live virus, after the regrettable incidents of the last few years. Everyone is fully aware of this, and everyone understands very well what the previous speaker has just said: that in this country they have gained the right to wait, and above all, they have the possibilities to wait.\textsuperscript{133}

“Nevertheless,” Lebrun continued, “I would like to draw the attention of the Conference to the fact that three quarters of the world's population live in under-developed areas. Those areas have no time to wait; they have no possibilities to wait.”\textsuperscript{134} Lebrun concluded, “We must, without a doubt, be cautious. But I do not believe that excessive caution should sterilize our work, and we

\textsuperscript{131} For more on the Cutter Incident’s long-term influence and institutional legacies in the United States see Oshinsky, \textit{Polio: An American Story}, 222-35; Offit, \textit{The Cutter Incident}.
\textsuperscript{132} Bess Furman, “U.S. is Standing Pat on Salk Vaccine for Polio; Advocates of Live-Virus Immunization Protest,” \textit{Special to the New York Times}, June 10, 1960, pg. 64
\textsuperscript{133} André Lebrun’s statement in ”Live Poliovirus Vaccines: Papers Presented and Discussions Held at the First International Conference on Live Poliovirus Vaccines,” 686.
\textsuperscript{134} Ibid.
must not forget that every day that passes brings new cases of illness in our world. It is our role to weigh carefully the existing risks, and then to decide what appears to us to be the most judicious course.”

Dr. Lebrun’s concerns were echoed by recently retired Bureau Director Fred Soper during the closing session of the second live vaccine conference the following year. Dr. Soper stated:

Some 80 to 85 million babies are being born each year into a world heavily infected with dangerous paralytic strains of poliovirus. The great mass of these are not being, and will not be, protected by a vaccine which is expensive and has to be injected. The needs of other peoples can be better appreciated if we visualize what our attitude would be towards live poliovirus vaccines were the Salk vaccine nonexistent.

In general, the papers presented by Latin American public health officials on field studies conducted in their own countries during the 1959 and 1960 conferences had several things in common concerning the role that user-needs played in vaccine adoption decisions. First, each Latin American actor who presented on live vaccine field studies in their own country pointed out that public health officials and scientists in their country were well-aware of the information and evidence about the inactive Salk vaccine. In each case the presenter would explain why the Salk vaccine was ultimately not viewed as a viable solution in their country, primarily for reasons of cost, epidemiological factors, and administrative difficulties. Second, each Latin American presenter (excluding those whose work was focused purely on laboratory studies), provided a series of reasons why public health officials had opted to go forward with the live vaccines, in spite of existing uncertainties about the vaccines. Without exception, the reasons provided were linked to the different ways in which the live vaccines addressed a range of needs.

135 Ibid., 682.
and conditions present in their own country. This suggests that needs of users was a significant factor driving the diffusion of the live vaccines. The case in favor of the live vaccines can be summarized as follows.

The live polio vaccines were much less expensive than the Salk vaccine which made them more readily available to developing countries. The live vaccines could be used in the absence of a well-developed health infrastructure based in the fact that they were administered orally and thus did not require trained health personnel to administer injections. The live vaccines could be used to effectively halt the spread of an epidemic already underway and were thus more useful in countries where epidemics were appearing more frequently and where preventive programs focused on polio were not yet in place. Lastly, the way in which the live vaccine produced immunity, by replicating in the intestine and thus replicating naturally acquired immunity, meant that, when administered en masse, the live vaccine could also provide passive immunity to other members within a given community by spreading through the normal oral-fecal route to unvaccinated individuals.

Direction of Diffusion: Who’s Learning from Whom?
In a centralized diffusion model, diffusion is primarily top-down with new innovations flowing from expert sources (typically in more advanced neutralized countries) to potential local-level users of the innovation (actors in developing countries). In contrast, Rogers’ decentralized model is characterized by a more horizontal peer-to-peer diffusion pattern. One of the factors that influenced the direction of diffusion of the live oral polio vaccines relative to the Salk vaccine, concerns the range of countries that participated in research and field studies for the two vaccines. Research and testing for the Salk vaccine was highly centralized within the United
States. The United States was the only country where field trials for the vaccine were carried out prior to licensing. Moreover, in 1955 when the WHO released its report on preliminary use of the Salk vaccine in the aftermath of the Cutter Incident, the only country experiences included in the report were from advanced industrialized countries.

In contrast, this sort of developed-to-developing country transfer wasn’t available for the live vaccines based on the fact that field studies and more operational research on the live vaccines weren’t initially conducted in the United States or other usual suspects (developed countries). As Dr. Sabin pointed out during the opening session of the 1959 live vaccine conference, “Our colleagues elsewhere in the world, often in the face of great opposition, have made it possible to obtain the answer, which we in the U.S.A. who developed and supplied the vaccines for international study, were unable to obtain ourselves.”

What Sabin was referring to was the fact that it wasn’t possible to conduct live vaccine studies in the United States for a number of different reasons, both political and practical. As a result, Latin American public health officials (and other officials from developing countries) did not have the option of relying on experiences from the United States or other advanced industrialized nations with the exception of the Soviet Union.

The live polio vaccine, although developed primarily by researchers at U.S. institutions, was not widely field tested in the United States beyond the initial Minnesota field studies in 1957 and 1958. During the 1959 conference Fred Soper was questioned about the lack of involvement of U.S. officials in the live vaccine studies. Soper explained that the Bureau had attempted to involve “additional participants,” namely U.S. Public Health Service officials, in the live vaccine field trials in Latin America, but made little headway in that regard. Soper went on to state:

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It should be a matter of record that before the Pan American Sanitary Bureau undertook any work outside of the United States with attenuated live poliovirus vaccine an approach was made to the Surgeon-General of the United States Public Health Service to establish its own criterion for participation in the planning of programs, and an invitation was extended to participate even in the collection and examination of such materials as might be indicated from the field.\(^{138}\)

The Surgeon General had not accepted Dr. Soper’s invitation. On the contrary, at the end of March 1959 (when the plans for the live vaccine conference were first reported by Dr. Payne to Dr. Sabin), U.S. Surgeon General Leroy Burney predicted it would be several more years before live poliovirus vaccines would be available for use in the United States. *The New York Times* explained that the Surgeon General “made his forecast after having deprecated the use of large populations in Nicaragua, Colombia, and the Belgian Congo” to conduct field trials for the live vaccines in recent months.\(^{139}\)

Beyond the initial Minnesota studies in 1957 and 1958, no additional larger-scale studies with the live vaccine were conducted in the United States until late 1959 and 1960, at which point PAHO polio advisor Maurício Martins da Silva and other PAHO consultants such as John R. Paul, played leadership roles in the studies, with PAHO also actively involved.\(^{140}\) Latin American public health officials were forced to rely primarily on field studies and innovation-evaluation information produced by other Latin American countries, as well as several other developing countries, the Soviet Union, and Soviet Bloc countries.

The influence of Latin American field studies and actors linked to Latin America through overlapping networks can be seen in the papers presented at the 1959 and 1960 live poliovirus vaccine conferences. The body of knowledge cited within presentations on Latin American field studies was relatively limited during both the 1959 and 1960 conferences, with a significant

\(^{138}\) Soper’s response to David Bodian during a closing discussion on June 26, 1959 in Ibid., 684.


amount of overlap in citations across presentations and publications. A basic analysis of sources cited by Latin American actors suggests that Latin American researchers and public health officials were actively seeking out research generated by other Latin Americans or in Latin America. Additionally, Latin American actors frequently cited personal communications and collaborative efforts with experts from other countries in the region, indicating that they were also relying on information from actors within their personal and professional networks, to inform their own research and policy recommendations.

It is worth noting that all of the Latin American representatives at the first and second live vaccine conferences, with the exception of Manuel Ramos Alvarez of Mexico, were public health officials as well as researchers, predominantly from national ministries of health, and thus had some level of decision making authority. For example, the Costa Rican delegation included Minister of Health, Dr. José M. Quirce and Director of Public Health, Dr. Oscar Vargas Mendez. Mexican field studies presented at the conferences similarly involved both the Minister of Health, José Alvarez Amézquita, and Vice-Minister of Health, Miguel Bustamante. This enhanced the influence that the conferences had on domestic policy decisions due to the fact that those involved in making the decisions were also those involved in generating and circulating the knowledge upon which the subsequent decisions were made.

In assessing the influence the two conferences had on subsequent developments in the field of polio control in the region of the Americas, PAHO Director Dr. Abraham Horwitz (elected to replace Fred Soper starting in February of 1959) stated:

We are of the opinion that the Organization [PAHO] has made a worthy contribution to the control of poliomyelitis, not only by giving advisory services to some countries in the Hemisphere in connection with live attenuated poliovirus vaccination programs but also
by affording outstanding research workers an opportunity to exchange opinions on a complex biological problem at the two conferences held in 1959 and in 1960.\textsuperscript{141}

The two live polio vaccine conferences had a significant influence, not only on Latin American policy adoption decisions, but also on the subsequent recommendations concerning the live vaccines made by the WHO’s Expert Committee. The WHO’s Expert Committee on Poliomyelitis was scheduled to meet on June 10, 1960, immediately following the second live vaccine conference. As a result every member of the WHO’s Expert Committee was in attendance at the conference. Although there were still a number of reservations expressed about the live vaccines, by 1961 it was undeniable that a shift in their favor had occurred.

\textbf{Chapter Conclusion}

The two basic objectives of this chapter have been: (1) to examine the different diffusion mechanisms that help explain polio vaccine diffusion in the Americas during the second half of the 1950s; and (2) to examine the extent to which Everett Rogers ideal-type centralized and decentralized diffusion models help explain the observed variation in innovation diffusion processes related to the Salk vaccine and live oral polio vaccines. Additionally, this chapter has attempted to highlight the myriad contributions made by Latin American public health officials, researchers, and local communities, in advancing the generation and circulation of polio-related knowledge that ultimately helped to pave the way for the broader use of the live polio vaccine worldwide.

The innovation development and diffusion of the inactive Salk vaccine was a highly centralized process dominated largely by the National Foundation for Infantile Paralysis. There

were only a limited number of people involved in the development process behind the vaccine and all of those involved were U.S. researchers. Even within the United States, Jonas Salk wasn’t known as a collaborator or strong scientific team player. The subsequent field trials to test the vaccine were similarly centralized and concentrated in the United States, focused entirely on the needs of U.S. populations (and populations in other similarly advanced industrialized countries). However, while in many ways the diffusion of the vaccine was also highly top-down and centralized, driven almost entirely by the National Foundation and other actors in the United States, the examples from the Americas suggest that possible adopters (Latin American public health officials) were far from passive recipients and actively sought out innovation-evaluation information, not from the United States or other advanced industrialized countries, but increasingly from their near-peers and the Pan American Health Organization.

The Salk vaccine diffusion wave in the Americas shortly after the vaccine became available in 1955, suggests that the initial decision to adopt the Salk vaccine in early-adopting Latin American countries was influenced by information generated and diffused from the United States. However, as more Latin American countries attempted to move beyond the adoption decision to begin implementing the Salk vaccine in polio immunization initiatives, new innovation-evaluation information was generated by these early implementation attempts. As a result, public health officials in Latin American countries could rely more on information generated in other Latin American countries, rather than simply relying on information generated by the United States and other advanced industrialized nations.

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142 When the Francis Report on the Salk vaccine was released to the public in April of 1955, Dr. Salk failed to give credit to or even recognize any of the people he had worked with on the vaccine. He claimed sole credit for the development of the vaccine which was far from the truth. This was just one example of Dr. Salk’s failure to collaborate and failure to acknowledge others that made his work possible that sparked a significant amount of criticism of Dr. Salk among members of the scientific elite during this time period. See Oshinsky, *Polio: An American Story*, 205-06.
The increasing importance of Latin American examples can be demonstrated with a simple counterfactual. If public health officials in Latin America had continued to make decisions about the Salk vaccine based on examples from the United States or other advanced industrialized countries, then one would expect to see the initial wave of diffusion sparked by the introduction of the Salk vaccine in 1955, to have continued throughout the remainder of the 1950s as the evidence from the United States concerning the Salk vaccine remained positive and there was virtually no official support for domestic use of the live polio vaccines in the United States. Moreover, one would expect that the diffusion wave would have continued and possibly accelerated once the United States removed export controls on the vaccine in 1957 and 1958, thereby making the Salk vaccine more readily accessible to potential Latin American adopters.

The evidence from the Latin American case studies presented in this chapter demonstrates that this was clearly not the case. On the contrary, Latin American public health officials increasingly looked to other countries in the Americas that had adopted the Salk vaccine and attempted to use it in domestic immunization programs, to inform not only their own adoption decisions, but also their implementation decisions. For example, many countries listed as having adopted the Salk vaccine as of 1956, did not report significant use of the vaccine in 1956 or 1957. In 1958 when Yale polio expert Dr. John R. Paul traveled to Latin America to consult with domestic public health officials, he reported that it “seemed unlikely” that Latin American ministries of health “will be easily persuaded at this time to purchase Salk vaccine or manufacture it locally in quantities that will cover more than a fraction of the population.”

Ultimately, while the Salk vaccine was developed and initially diffused by actors within the United States, it is clear that Latin American public health officials were, for the most part,

144 Paul, "Observations on Poliomyelitis in Latin America (September 1 1958 - October 15 1958)," 15.
looking to their Latin American counterparts, actors within their own personal and professional networks, and to PAHO, for innovation-evaluation information. This demonstrates a more horizontal, and interactive, peer-to-peer exchange, rather than a unidirectional, top-down transfer of new innovations or uncritical emulation of decisions made in more advanced industrialized countries.

While the Salk vaccine innovation development and early diffusion process does appear to be more highly centralized than the processes associated with the live oral polio vaccine, the development and diffusion processes linked to the live vaccines were also characterized by a number of more centralized aspects. Technical experts were similarly responsible for the research behind the live polio vaccines. However, the live vaccine research and development processes involved a much broader range of experts from a much broader range of countries. They also involved active participation of public health officials in many countries beyond the United States. Additionally, the field studies for the live vaccine were conducted under a wide variety of different epidemiological and local conditions in more than 25 countries.

An additional difference between the two vaccines concerns the extent to which the needs of potential adopters (and which adopters) influenced the different innovation development and diffusion processes. The Salk vaccine was not developed with the needs of users beyond the United States and the industrialized world in mind. It was tested within a very limited sample population that focused on the demographics most vulnerable in the United States, namely children over the age of five years old. In the majority of Latin American countries polio was a disease of the very young and afflicted primarily children under the age of five and often under the age of three. As a result, the Salk vaccine field trials did not provide evidence concerning the extent to which the vaccine would actually be effective in the majority of Latin American
countries. Moreover, the Salk vaccine required multiple injections (as many as four) to produce sufficient immunity when it was initially developed and made available. This administrative requirement further complicated the introduction of the vaccine in most Latin American countries where routine access to health care, required to administer the necessary doses, was scarce and nonexistent in many areas. Although the live vaccine similarly required multiple doses, administration was simplified by the fact that the vaccine could be given orally.

Variation in Diffusion Mechanisms

A major difference between the diffusion of the Salk versus live oral polio vaccines in the Americas had to do with the diffusion mechanisms available to each of the two vaccines. Based on a number of attributes related to the two vaccines and their initial development (mentioned above) there were different (and more effective) diffusion mechanisms driving the diffusion of the live polio vaccines that weren’t similarly available to the Salk vaccine. The primary diffusion mechanisms that help explain the cross-national diffusion of polio vaccine innovations in the Americas identified in this chapter include: (1) geoepidemiology, including demonstration effects or near-peer observations of the experiences of countries where the innovation has already been adopted (“previous adopters”); (2) direct involvement of policy entrepreneurs or “change agents” such as Albert Sabin, Maurício Martins da Silva, and Fred Soper; (3) communication channels involving overlapping actor networks linking domestic public health officials and researchers to actors in other countries; (4) innovation-evaluation information generated and circulated by the Pan American Sanitary Bureau regarding the two polio vaccines.

The communication channels and diffusion mechanisms through which Latin American actors learned about the two vaccines differed significantly. The Salk vaccine was introduced to
the world through a massive press conference on April 12, 1955, and in the days and weeks following, information about the vaccine was widely published in the popular press. While the information circulated in the popular press was initially extremely positive and omnipresent, if Everett Rogers’ claims about the limited influence of impersonal communication channels are correct, then mass media channels alone would not have been sufficient to generate domestic policy adoption decisions. Instead, as Rogers claims, interpersonal networks, observations of near-peer experiences, and change agents, appear to have been more influential in driving domestic adoption decisions. However these more influential diffusion channels were much more readily available for the live oral polio vaccines than they were for the Salk vaccine. More specifically, the near-peer observations and communications regarding the Salk vaccine in the Americas primarily served to decrease interest in the Salk vaccine among Latin American actors due to its poor performance when used in Latin American countries.

While Latin American actors amassed new information about the Salk vaccine at international conferences, through scientific publications, and the popular press, the Salk vaccine did not have the same kind of personal advocacy in the Americas that the live vaccines benefitted from. The National Foundation for Infantile Paralysis, the primary advocate for the Salk vaccine, did not work directly in countries beyond the United States. Its mandate and focus was primarily limited to solving the polio problems of the United States. Similarly, Dr. Salk was not an active champion for the Salk vaccine in other countries nor did he seek out collaborative work with actors in other countries. Dr. Salk was invited to visit the Soviet Union before a polio vaccine adoption decision had been made there, and famously declined, whereas Dr. Sabin jumped at the opportunity.\textsuperscript{145} Subsequently, it was the Sabin, rather than Salk, vaccine that was administered to millions of Soviet children in 1959. Dr. Salk similarly declined invitations to travel to Brazil to

\textsuperscript{145}Oshinsky, \textit{Polio: An American Story}, 251.
confer with local officials in 1958 where Dr. Sabin and other live vaccine promoters were quick to accept these international invitations.

A powerful network of actors involved in live vaccine research and who supported the live oral polio vaccine were an almost constant presence in many Latin American countries during the second half of the 1950s. Key and highly credible actors such as John R. Paul, Dorothy Horstmann, Herald Cox, Albert Sabin, Joseph Melnick, Maurício Martins da Silva, and Fred Soper, traveled frequently to meet with Latin American public health officials and collaborate with domestic researchers on a range of live vaccine studies and immunization initiatives. They brought new information about the vaccine to the places they visited and also discussed a range of issues related to the needs of domestic actors that were then often integrated into subsequent studies or innovation developments. Additionally, key Latin American actors who were leaders in Latin American field studies such as Manuel Ramos Alvarez and Maurício Martins da Silva, trained under and worked with North American leaders who favored live vaccines such as Albert Sabin, Joseph Melnick, and the community of experts at Yale and the University of Minnesota and Minnesota Department of Health Laboratories. This helped to create a multi-directional flow of information and new evidence concerning the live vaccines and polio research more broadly.

Another factor that helps explain the variation in vaccine use concerns the simple issue of availability. In contrast to the Salk vaccine which was initially unavailable in Latin America on any large-scale based on export controls in the United States that lasted until the live vaccine was already approved for field testing, both Herald Cox (developer of the Cox-Lederle polio vaccine) and Albert Sabin, provided strains of their vaccines to Latin American officials at no charge for use in field studies. Additionally, PASB Director Fred Soper proactively reached out to public
health officials in the Americas offering the Bureau’s support and technical cooperation for field studies involving either the Cox-Lederle or Sabin live vaccine strains. For example, in early 1958 Soper traveled to nearly a dozen Latin American countries to explain the Bureau’s position on the vaccines and discuss possible collaborative initiatives the Bureau could help facilitate involving additional technical cooperation from the Lederle Laboratories or the Regional Polio Laboratory at Yale. Everett Rogers argues that the provision of free samples and other promotional efforts made by “change agents” are among the most effective ways to speed up the innovation diffusion process related to a given innovation. The Latin American experience with the live vaccines supports this argument.

Another method of speeding up diffusion that was key in the diffusion of the live polio vaccines in the Americas but was totally lacking concerning the Salk vaccine was the organization of demonstration projects so that potential adopters of the new innovation could observe the innovation in action in a setting that was roughly equivalent to their own. Innovation promoters such as Sabin, Cox, Martins da Silva, and Soper, helped to facilitate these demonstrations through various field studies and collaborative initiatives. The results of these studies were then spread to other countries in the Americas through the direct involvement of key actors such as Martins da Silva or Herald Cox, both of whom were directly involved in field studies in six or more Latin American countries between March of 1958 and March of 1959.

In addition to direct actor involvement, the experiences of early adopters such as Colombia and Mexico, were highlighted in PAHO’s various technical reports, published in leading scientific journals, presented at domestic and international professional association meetings such as the American Academy of Pediatrics, and featured at high-profile issues-
specific symposium such as the two international live poliovirus vaccine conferences as well as the various international polio conferences hosted by the National Foundation.

In stark contrast, there were virtually no major promotional efforts for the Salk vaccine in Latin America, beyond the information published in the popular media and through professional associations. An interesting note on this issue is that when Dr. Jonas Salk was invited to travel to Brazil to confer with Brazilian President Juscelino Kubitschek and leading public health officials, Dr. Salk declined stating that he had more pressing commitments to attend to. There weren’t any leading figures in the field of immunology or polio research such as Albert Sabin or John R. Paul promoting the Salk vaccine in the Americas, nor were there any efforts to make the Salk vaccine more readily available such as free distribution of samples, that might have encouraged its diffusion. On the contrary, leading figures in the field (including those at the Pan American Sanitary Bureau) actively opposed the use of the Salk vaccine in the Americas and made their opinion known during their travels and work in different countries in the region. Not only did the Bureau refuse to recommend large-scale use of the Salk vaccine in the Americas (as discussed previously in this chapter) individual actors such as Joseph Melnick and Dorothy Horstmann consistently expressed their view that the Salk vaccine was unsuitable for use in most Latin American countries.

In summary, many of the diffusion mechanisms argued to help explain the cross-national diffusion of innovations in this chapter, were largely unavailable in the case of the Salk vaccine. There were not positive demonstrations of its effective use among similarly situated Latin American countries that domestic public health officials could draw on to inform policy decisions. There were no interpersonal networks of researchers and public health officials from different countries working together on Salk-vaccine related research and testing. There were no
PASB/PAHO hosted forums devoted to the Salk vaccine hailing its potential to eliminate polio in the region thanks to its administrative ease and availability to all countries regardless of their level of economic or infrastructural developments. There were no key actors with long-standing ties and relationships in Latin America advocating for the Salk vaccine and using their personal connections to meet with Latin American presidents and public health ministers to discuss the possible use of the vaccine.
CHAPTER 3
IMPLEMENTATION ATTEMPTS IN THE LATE 1950s & EARLY 1960s

In February of 1962, shortly after the live oral polio vaccine became widely available, Cuban public health officials used the vaccine to launch the country’s first national immunization days (NIDs). Within a single year of the campaign’s launch, Cuba had effectively interrupted domestic polio transmission, making Cuba the first country in the Americas, and only the second country in the world, to eliminate polio. Throughout the course of the 1960s almost every other country in Latin America implemented some sort of polio immunization campaign, however, with varying degrees of success and none nearly as successful as Cuba. The eradication objective and mass campaigns in Cuba during the early 1960s, although highly effective, were not in line with the guiding public health ideology within PAHO during the 1960s. With the change in leadership from Fred Soper to Abraham Horwitz in 1959, came a dramatic shift in priorities within the Organization.

Under Abraham Horwitz’s direction, PAHO moved away from the more centralized and vertical programs of the previous decade, and quickly shifted to promote more integrated and comprehensive health and development initiatives. Mass campaigns and disease-specific programs were relics of a previous era of underdevelopment in Latin America. Instead, during the early 1960s, Latin American countries were urged to look at the successful models of more advanced industrialized countries where basic interventions such as immunizations, were given as part of routine public health services available in permanent health facilities. The case studies in this chapter demonstrate that the ambitious change in direction proposed by Dr. Horwitz and his colleagues at PAHO during this period did not necessarily align with existing domestic capacity in the region or address the needs of PAHO Member Nations.
Chapter three uses a paired case study of Mexico and Brazil to examine the ways in which overlapping domestic and external factors influenced domestic adoption, adaptation, and implementation of polio immunization initiatives in the late 1950s and early 1960s. The key factors that help explain cross-national variation in Brazil and Mexico during the late 1950s and early 1960s include: (1) stewardship - the ability of the central government and Ministry of Health to plan and enact policies throughout the health sector nationwide, coordinate the actions of actors involved in the health sector, collection and utilization of evidence, stability of leadership; (2) domestic public health precedent - existing vaccination-related legislation, norms of state intervention in health, prior experience with polio or mass vaccination campaigns; (3) domestic actors, communities of experts, and transnational actor networks, and their involvement in domestic policy processes; (4) health system capacity - the scope of the health system, local level capacity, service delivery, and disease surveillance; (5) geoepidemiology and international relations; (6) external actor influence - external advisors, the provision of material resources or assistance.

Chapter three begins with a regional overview explaining shifts in public health paradigms taking place in the region and within PAHO related to a change in leadership from Director Fred Soper (1947-1959) to Abraham Horwitz (1959-1975). This is followed by an in-depth examination of the Cuban case where polio campaigns were implemented in 1962, which ultimately became a sort of policy model for the rest of the region during the 1980s. The remainder of the chapter is focused on a paired case study of policy adoption and implementation episodes in the late 1950s and early 1960s in Brazil and Mexico. Within these case studies I examine how variations in the aforementioned factors, and interactions among factors,
contributed to cross-national variation in polio immunization-related policy development and associated outcomes in Brazil and Mexico.

Paradigm Shifts and Policy Debates in the 1960s

The 1960s marked the beginning of a reorientation within the global health community away from the post-war favor for eradication campaigns towards a broader and more integrated approach to health and development. Although the WHO continued to support a global malaria eradication campaign throughout the 1960s and launched a global smallpox eradication campaign towards the end of the decade, a clear shift away from eradication was evident within international organizations. Nowhere was this shift more apparent than within the Pan American Health Organization. While PAHO had been the engine of many eradication initiatives under its ardent eradicationist director Dr. Fred Soper (1947-1959), on February 1, 1959, Chilean physician Dr. Abraham Horwitz assumed the directorship of the organization signaling the end of the eradication era.

Horwitz was the first director in the Organization’s history to come from the “developing” world. Nancy Leys Stepan writes that Horwitz “was a very different man from Soper, with a different orientation in public health.” She explains that Horwitz brought a “new tone and new ideas in international public health work” with him to the Bureau in 1959 focusing on links between health and economic development and more integrated approaches to health system development. Horwitz’s view, and the view promoted within PAHO under his leadership, was that so-called “vertical” or targeted disease-specific programs like the malaria and smallpox eradication campaigns could not and would not be effective in the absence of

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2 Ibid.
stronger domestic health services and the development of permanent infrastructure for health.³ Horwitz championed this perspective throughout his 16year tenure as PAHO’s director.

The change in orientation is clearly articulated in the Annual Director’s Reports under Horwitz. In 1964 Horwitz wrote:

In the Americas today there are technical and other reasons why programs are being directed at a single health problem or a single disease—the ‘vertical’ approach. But there are also good reasons for making increasing investments to improve permanent services which deal with day-to-day programs and not solely with emergencies - the ‘horizontal’ approach…In the Americas the time of the great epidemic diseases that decimated the population is fortunately past. The present time is one of organized programs for sustained development, and that calls for permanent institutions established by the law and designed to serve the common wealth.⁴

As will be seen in the case studies in this chapter, the ambitious change in direction proposed by Dr. Horwitz and his colleagues at PAHO during this period did not necessarily align with existing domestic capacity in the region. Moreover, they didn’t align with PAHO’s institutional capacity or technical cooperation programs in many ways as well.

By the end of the 1950s and during the early 1960s, PAHO’s institutional capacity was well suited to facilitating the diffusion and even generation of innovations in the Americas as the examples from the live polio vaccine studies in the previous chapter indicated. As of 1961 there were two alternative polio vaccines available for use in the Americas and PAHO had helped to influence domestic vaccine adoption decisions by facilitating the cross-national circulation of information and new innovations, advising domestic governments, and coordinating field trials. These activities were among the core centralized functions the Organization was both authorized and obligated to provide to its Member Nations according to PAHO’s Sanitary Code and Constitution. However, what each country did with the vaccines after adoption was beyond the

scope or capacity of PAHO’s technical cooperation at the time. PAHO would continue to assist
countries with polio-related work on a case-by-case basis; however, PAHO would no longer
support larger and more coordinated programs on polio. Implementation was left to PAHO
Member Nations.

Everett Rogers writes, “Until the implementation stage, the innovation-decision process
has been a strictly mental exercise of thinking and deciding.”⁵ He explains, “It is one thing for an
individual to decide to adopt a new idea, quite a different thing to put the innovation into use, as
problems in exactly how to use the innovation crop up at the implementation stage.”⁶ The
enormous range of domestic factors influencing implementation that “cropped up” once
countries moved beyond the initial adoption phase of the policy process, were more than PAHO
could adequately address. During this period PAHO actively promoted greater decentralization
within the Organization and greater delegation to domestic governments and PAHO’s field
offices, however, the centralized functions provided by PAHO to support domestic governments
as they attempted to implement a broader range of public health programs, remained poorly
institutionalized. As a result, throughout the 1960s there appears to have been a sort of
disconnect between the policy models and implementation structures proposed by PAHO and the
institutional capacity of most PAHO Member Nations.

With the shift away from “military style” eradication or disease-specific campaigns under
Abraham Horwitz, the models increasingly endorsed by PAHO emphasized the delivery of
routine immunizations as part of more integrated and comprehensive health services (services
that did not exist in many Latin American countries during this period). Mass campaigns and
other delivery strategies that relied on mobile brigades rather than permanent integrated health

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⁵ Rogers, *Diffusion of Innovations*, 179.
⁶ Ibid.
facilities were evidence of underdevelopment. In 1965 Horwitz commented on the polio situation in North America stating, “If the impressive reduction in incidence in the United States of America is anything to judge by, systematic immunization should be given at health centers.”

However, in spite of PAHO’s support for routine immunization services and more integrated health system development, domestic conditions in most countries in Latin America made PAHO’s proposals all but impossible to adopt and effectively implement. Based on the weaknesses of domestic health systems in the region during the 1950s and 1960s, it would have been virtually impossible for the majority of Latin American countries to control polio through systematic immunizations given at permanent health facilities. Even countries such as Chile, Costa Rica and Uruguay where child health services and immunization programs were already well established by the 1960s, polio was eliminated (much like in the United States) through a combination of mass campaigns and routine immunization services. The various constraints and domestic and external factors that influenced policy implementation in the Americas are examined in detail throughout the remainder of this chapter.

Cuba and the Policy Model that Wasn’t

In their book, *Understanding Policy Fiascoes*, Mark Bovens and Paul t’Hart suggest that, “In assessing policy outcomes, where one stands often depends on when one looks.” The “when” in question concerning the launch of Cuba’s national polio immunization crusade, undoubtedly influenced how external actors assessed the campaign and the factors attributed to the success of the campaign. Between 1961 and 1962, the United States launched the Bay of Pigs invasion of

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Cuba, Cuba nationalized all foreign property and businesses on the island causing the United States to retaliate by severing diplomatic and economic ties and imposing a far-reaching economic embargo on the island, the communist nature of the Cuban Revolution was established leading to Cuba’s expulsion from the Organization of American States (OAS), and the Cuban Missile Crisis brought the world dangerously close to nuclear war. In the midst of all this, Cuba also became the first country in the Western Hemisphere to launch a national polio immunization campaign using the live oral polio vaccine developed by Russian-born Albert Sabin and Mikhail Petrovich Chumakov, a leading virologist in the Soviet Union. Cuba became the first country in the hemisphere and only the second in the world, to totally eliminate polio shortly thereafter.

Forty years after the fact, the World Health Organization’s World Health Report for 2003 included a chapter on global polio eradication that began the story of eradication in Cuba in 1962. According to the report:

Just 12 months after Albert Sabin’s widely hailed oral polio vaccine (OPV) was licensed in most industrialized countries, Cuba began using the vaccine in a series of nationwide polio campaigns. Shortly thereafter, indigenous wild poliovirus transmission had been interrupted. In other words, no Cuban child would ever again suffer this devastating disease as the result of a Cuban poliovirus...Seldom, if ever, had a new health technology been fully exploited so successfully and so early in its lifespan, to the benefit of so many people.  

Regardless of the fact that the Cuban model ultimately became known as the pioneering program that it was, throughout the 1960s and early 1970s, the broader applicability of the Cuban model was questioned due to claims of causality between Cuba’s communist political system and the success of the polio and other health campaigns. Some critics argued that Cuba’s strategy, if not entirely dependent on the communist political system, was still dependent on Cuba’s highly centralized and controlled decision-making, extreme military involvement and

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enforcement capacity, the relatively small size of the territory and population in question, and Cuba’s capacity for mass mobilization and propaganda campaigns. These arguments were bolstered by the fact that other countries that had been similarly successful in combating polio in the early 1960s included the Soviet Union and other Eastern Bloc countries, especially Czechoslovakia.

While several of these basic aspects undeniably facilitated Cuba’s success, in the following case study I examine several key aspects of the Cuban campaign that I argue more accurately explain the effectiveness of the Cuban model. The core elements of the Cuban policy model that were largely responsible for its effectiveness were not dependent on Cuba’s political system or any other features that were wholly unique to Cuba under the revolutionary post-1959 government. Moreover, the core elements of the Cuban model were highly adaptable and could be implemented in a diverse range of settings and contexts given sufficient domestic institutional capacity and/or support from external actors such as PAHO. In fact, during the 1970s and 1980s, every country in Latin America adopted and adapted some version of this basic model and effectively eliminated polio.

The core aspects of the Cuban polio model included: (1) adaptive capacity of the Cuban health system at the time of the campaign’s launch in the early 1960s; (2) stewardship of the central government that facilitated an effective combination of centralized oversight and decentralized implementation that included clear programmatic norms and procedures established prior to the program’s launch; (3) centrally coordinated multisectoral cooperation among different institutions and organizations including but not limited to the health sector (also related to stewardship capacity); (4) community mobilization and participation; (5) public information and education related to the campaign; (6) availability of credible indicators - an
early priority for disease surveillance and reporting to monitor the program and guide its
development; (7) health system capacity including the coverage and scope of the program to
reach the entire population from the very beginning and the relative authority and responsibility
assumed by the central government for basic public health services, including, but not limited to,
immunizations.

Pre-Revolutionary Precedent and Cuban Public Health History

Few people would believe that a mosquito could help change the fate of an entire nation.
However, in Cuba, the presence of the *Aedes aegypti*, the type of mosquito responsible for the
transmission of yellow fever, helped alter the development of the Cuban nation as well as the
Cuban healthcare system.\(^\text{10}\) During Cuba’s war of independence (what would become known as
the Spanish-American War), yellow fever was responsible for more casualties within the Spanish
army than combat. Prior to United States intervention in Cuba in 1898, reports of Spanish
casualties between 1895 and 1898 show that only 704 soldiers were killed in battle and 8,164
died from their wounds, while 13,000 soldiers died from yellow fever.\(^\text{11}\) Among the justifications
provided for the United States to intervene in 1898, were those made on health grounds and the
impact poor health on the island might have for both the health of the United States and the
commercial transactions it carried out with Cuba. After U.S. intervention, some of the major
efforts undertaken by U.S. personnel on the island were linked to sanitation. In the city of
Santiago de Cuba, for example, Military Governor General Leonard Wood (a Harvard educated
doctor) overhauled the city’s sanitation system. Similarly, in Havana the new chief sanitary
official, Major William Gorgas (a trained surgeon), set out to sanitize the capitol city first by

\(^{10}\) For more on this see Mariola Espinosa, *Epidemic Invasions: Yellow Fever and the Limits of Cuban Independence, 1878-1930* (Chicago: University of Chicago Press, 2009).

systematizing the ways in which disease reporting and surveillance took place and making more information available to health authorities, thereby facilitating more rapid responses to outbreaks.  

In only a few years of American occupation, death rates on the island declined from 25,252 to 5,720 per year. As the timeline for U.S. troop withdrawal (scheduled for 1902) neared, the concern of many in the United States and Cuba was, to what extent would Cuban government officials be able to maintain and further develop the public health achievements experienced during U.S. occupation? Governor General Wood registered his apprehension in 1901 writing:

If the coming government does not systematically support this department [sanitation], it is bound to go under because the municipalities will not be sufficiently developed and public sentiment sufficiently educated and organized to maintain a system which has brought so many benefits to the sick and suffering of the island.

What is particularly significant about Wood’s remark is the attention placed on subnational institutional capacity concerning public health and sanitation services. Wood is calling for greater authority and responsibility to be assumed by Cuba’s central government to ensure adequate protection of health throughout the island. Accordingly, in an attempt to protect against the collapse of the incipient health and sanitation systems in Cuba, U.S. lawmakers included a potential safeguard for public health in the Platt Amendment (a code of conduct Cuba would need to accept and abide by to end the U.S. military occupation and avoid future U.S. military intervention). Among the conditions established was a mandate that the Cuban government had to ensure a certain modicum of public health on the island. Article five of the Platt Amendment stated:

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The Government of Cuba will execute, and, as far as necessary, extend the plans already devised, or other plans to be mutually agreed upon, for the sanitation of the cities of the island, to the end that a recurrence of epidemic and infectious diseases may be prevented, thereby assuring protection to the people and commerce of Cuba, as well as to the commerce of the Southern ports of the United States and the people residing therein.¹⁵

According to article five, Cuba would need to maintain its public health system or risk its hard-won independence. The early linking of public health to national security on the island helped frame issues of health as issues of great national concern. This politicized health and was used by government officials to mobilize support for public policy responses to disease that were often highly interventionist. For example, after a 1943 outbreak of typhoid, the Cuban Minister of Health ordered obligatory inoculations in “at risk” districts throughout the island.¹⁶ Later that year the Cuban government directly linked health to national security and defense in the face of a syphilis outbreak. A new organization was established to carry out a “war” against the disease. The Institute of Serology was directly attached to the Department of Defense, and was inaugurated along with a national campaign to eradicate syphilis from the island.¹⁷

These are just several examples of the ways in which Cuba’s pre-revolutionary preoccupation with health as an issue of national security helped to establish a strong public health precedent on the island favoring proactive state intervention in the control and prevention of disease. This precedent made subsequent public health interventions launched by the revolutionary government post-1959 more palatable to the Cuban population immediately after the Revolution took power.

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¹⁷ “Cuba Wars on Syphilis,” The New York Times, November 30, 1943, pg. 8
Program Adoption and Borrowing from the Czech Model

Polio in epidemic form appeared earlier in Cuba than it did in most other countries in Latin America and the Caribbean.\textsuperscript{18} By 1955 when the Salk vaccine was first introduced in the United States, Cuba was already experiencing increasingly severe and frequent epidemics of the disease. Immediately prior to the release of the Salk vaccine on April 12, 1955, the \textit{New York Times} reported that Cuban officials had already purchased the vaccine from a West German manufacturer and had begun using the vaccine on a limited basis on April 13, 1955.\textsuperscript{19} However, the vaccine was administered on a very limited basis primarily by private physicians and without sponsorship or participation of the national government or public health authorities.\textsuperscript{20}

Cuban virologist Dr. Juan M. Embil summarized Cuba’s experience with polio vaccination at the First International Conference on Live Poliovirus Vaccines hosted by PAHO in June of 1959. During his presentation Dr. Embil explained:

> The use of the Salk-type vaccine presents a number of problems for countries whose social and economic conditions are like those of Cuba. For this reason, and because of the long and successful use of smallpox and yellow fever live virus vaccines in Latin America, the initiation and pursuit of the work with oral attenuated poliovirus vaccines by the Lederle group and the later entrance of Sabin in this field have been followed with great interest.\textsuperscript{21}

In 1958, PASB Director Fred Soper worked with Cuban scientists and Dr. Herald Cox at the Lederle Laboratories to coordinate field trials with live virus vaccines. It is important to note that this adoption decision was made prior to the Cuban Revolution in 1959 and was sustained throughout the dramatic shift in leadership and reorganization of the healthcare system that took place starting shortly thereafter. Field trials under the direction of Dr. Embil began in May of

\textsuperscript{20} Juan M. Embil, "Response of Cuban Children to Oral Vaccination with Living Attenuated Poliovirus Vaccines," \textit{British medical journal} 1, no. 5180 (1960): 1158.
\textsuperscript{21} Embil et al., in "Live Poliovirus Vaccines: Papers Presented and Discussions Held at the First International Conference on Live Poliovirus Vaccines," 593.
1958 and were expanded during the next 18 months. At the Second International Conference on Live Poliovirus Vaccines hosted by PAHO in June of 1960, Dr. Embil explained, “The speed, simplicity, and effectiveness of the trivalent vaccination under Cuban conditions obviously makes it the method of choice.” He concluded his presentation with an ambitious and prescient prediction stating: “We believe that poliomyelitis as a public health problem in Cuba will disappear.”  

Czechoslovakia was the first country in the world to effectively eliminate polio using the live oral polio vaccine (Sabin strains) in nationwide mass immunization campaigns starting in 1960. Public health historian Ross Danielson explains that World War II had almost entirely destroyed Czech health care facilities while also resulting in the loss of nearly 50% of Czech physicians. The instability and destruction caused by the War was followed by the transition to socialism, creating new challenges. Yet in spite of the obstacles, the Czech health care system emerged like a phoenix from the ashes of the 1940s, and, by the end of the 1950s comprehensive and organized health services were available even in remote villages.  

Danielson suggests that the dramatic transformation of the Czech healthcare system provided a particularly appealing model to Cuban officials. Accordingly, when Cuban public health authorities began developing a plan for a national polio immunization campaign in 1959 they sought and received assistance and advice from Czech health officials who were in the midst of their own extremely successful immunization campaign. Renowned Czech virologist Dr. Karel Žáček at the Sera and Vaccines Institute located in Prague was the key advisor to the Cuban campaign starting in 1960.

A key factor that helps explain the development of the Cuban polio campaign in the early 1960s has to do with the broader health system and its state of development during the early

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23 Danielson, Cuban Medicine 158, fn. 39.
1960s when the campaign was launched.\textsuperscript{24} The campaigns were launched before there was a clearly entrenched set of operating procedures guiding the health system or individual programs. Ross Danielson writes, “In a time when officials and health workers with operational responsibilities acted with great improvisation, a popular style of leadership was frequently seen which tended to involve everyone in decision making meetings.”\textsuperscript{25} According to Danielson this “new style” of leadership was one of the most important features of Cuban revolution in the early 1960s. During the early 1960s Cuban public health officials were actively seeking out new ideas and ways of doing things that were both compatible with the new leadership’s revolutionary ideals and principles, and also feasible given the constraints Cuban officials faced.

It is worth noting here that Cuba’s pre-revolutionary health profile was significantly better than the health profiles of most other countries in the hemisphere at the time of the Revolution. During the period between 1900 and 1960, Cuba reported faster progress in decreasing infant mortality than any other country in Latin America, and as a result, Cuba had the lowest infant mortality in Latin America by the time the Revolution took power in 1959.\textsuperscript{26} However, pre-revolutionary Cuba was characterized by significant disparities in access and outcomes between urban and rural populations, with the vast majority of doctors and services concentrated in Havana and many rural residents lacking access to care.

In the aftermath of the Cuban Revolution one of the largest constraints public health officials had to address was the loss of roughly one-third of all Cuban doctors who fled the island shortly following the Revolution in 1959. The new revolutionary government had to figure out a way to delivery services to more people and in harder-to-reach areas with fewer resources (both

\textsuperscript{24} For more on Cuba’s health system development during this period see Ross Danielson, chapter six “Early Transition to Socialism,” (1979): 127-162
\textsuperscript{25} Danielson, \textit{Cuban Medicine} 146-47.
human and material). These domestic constraints and the experience involving the use of mass organizations to participate in polio campaigns in the Soviet Union helped to shape the Cuban strategy developed in the early 1960s. In the absence of trained medical personnel and limited health facilities where people could bring their children to be vaccinated, Cuba would use volunteers to bring the vaccine to the people.

Centralized Planning, Decentralized Implementation, and Intersectoral Collaboration

Sheryl Lutjens suggests that “guerilla administrators” with a “por la libre (free-wheeling)” approach to public administration and policy implementation dominated the earliest years of the new revolutionary government.\(^{27}\) In addition to losing one third of the total number of doctors on the island, in the aftermath of the Cuban Revolution 15,000 to 20,000 public administrators went into exile, resulting in a major shortage of experienced administrators for the new government to work with. The haphazard approach to policy administration and implementation produced unsatisfactory performance and delivery of services, which resulted in a reorganization of the government bureaucracy and administrative structures starting at the end of 1961.\(^{28}\)

Within the Cuban healthcare system, a massive reorganization was initiated in 1962, creating both top-down and bottom-up mechanisms that characterize the health system to this day. The 1962 restructuring created a national level of health bureaucracy responsible for “norms and orientation” of health policies and the overarching healthcare culture that developed on the island. This established the clear stewardship role of the central government for overseeing overarching developments and planning throughout the health sector. A decentralized system of


\(^{28}\) Ibid.
provincial and regional bureaucracies and institutions responsible for implementing national policies and direct service provision was created simultaneously. This approach, referred to as “normative centralization and administrative decentralization,” was a central component of the Czech health care system that Cuban health officials drew heavily from.29

An additional aspect of the emerging healthcare system involved the “creative use of taskforces or groups” established at both national and subnational levels, which according to Danielson helped create and diffuse “norms or guidelines for many practical matters of health work and organization.”30 According to Danielson, the polio campaign in 1962 was “prototypical” of this new approach within the Ministry of Public Health.31 A National Commission of Antipolio Vaccination was established at the Ministry of Health that was responsible for developing technical guidelines and programmatic norms for the national campaign. The Commission included officials from the Sub-Secretariats of Hygiene and Epidemiology and Medical Assistance with Dr. Žáček serving the Commission as an expert advisor.

In addition to the more technical commission, a National Coordinating Commission (CNC) was also established at the Ministry of Health that included the Sub-secretary of Hygiene and Epidemiology, the Sub-secretary of Medical Assistance, and the presidents and/or leaders of the National Medical College, the National Red Cross Organization, the Committees for the Defense of the Revolution (CDRs), the Federation of Cuban Women (FMC), the Young Rebels Association (AJR), and the National Small Farmers’ Association (ANAP). The CNC’s fundamental purpose and obligation was to facilitate the “incorporation of the Cuban people in

29 Danielson, Cuban Medicine 143-44.
30 Ibid., 148.
31 Ibid.
the activities of the Campaign to contribute to the creation of a national sanitary consciousness.”

In each regional division, a commission was established to coordinate and supervise all of the different aspects of the campaign in the corresponding region. Each commission included the regional Director of Public Health, regional representatives of the Sub-Secretariats of Hygiene and Epidemiology, Medical Assistance, Women and Children, the Provincial Council of Education, and regional leaders of participating Mass Organizations. A municipal commission was similarly established in every Zone (locality or municipality) that was responsible for the coordination and execution of the actual vaccination work at the local level. Municipal commissions supervised the work done by all vaccination teams and mobile vaccination units in the locality served.

In addition to the coordinating work with municipal commissions, regional commissions were also responsible for storing and distributing the vaccine. It is significant to note that detailed technical and operational guidelines were established from the inception of the campaign concerning the storage and distribution of the vaccine throughout the entire country and establishing the foundation for a national cold chain in Cuba. The basic cold chain established for the polio campaign provided a foundation for the cold chain used to support Cuba’s national immunization program launched later in 1962.

In addition to the Ministry of Health and corresponding national and subnational coordinating commissions, there were a number of non-health related ministries that assisted the campaign in various ways. The Cuban Ministry of Education supported the campaign by

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33 Ibid., 12.
34 Ibid., 13.
encouraging local schools to host vaccinations and encouraging teachers to include information about polio and vaccination prior to the campaigns into daily curriculum. The Ministry of Revolutionary Armed Forces provided helicopters to transport the vaccine to different regional distribution centers and helped vaccinate communities in hard to reach areas. The National Institute of Agrarian Reform (INRA) provided refrigeration vehicles to transport the vaccines throughout the island creating an effective cold chain to ensure that the full potency of vaccines was maintained.35

Danielson highlights the important role that informal networks among Cuban elite actors played in the early development of the health system and especially in terms of facilitating collaboration among institutions both inside and outside of the health sector. He explains that informal networks helped “bring together the efforts of people from different institutions,” and that individual cooperation paved the way for institutional cooperation.36 Intersectoral collaboration emerged from interpersonal networks of key actors involved in the institutional development underway in the early 1960s. This intersectoral coordination would come to be a hallmark of subsequent Cuban public health initiatives and was also one of the key factors contributing to the success of later campaigns launched in other Latin American countries during the 1980s.

Community Participation and Mass Mobilization

There were several additional contextual changes taking place simultaneously with the development of the polio immunization campaigns in 1960-1962 that greatly facilitated their subsequent implementation. The primary changes included the creation of the Rural Health

35 Informe Preliminar, 15-16.
36 Danielson, Cuban Medicine 148.
Service in early 1960s and the creation of People’s Health Commissions the following year in 1961.\textsuperscript{37} The primary objective of the Rural Health Service was to extend healthcare to rural areas in an effort to reduce health disparities between rural and urban populations. Each new rural health center was staffed with at least one doctor who oversaw the center, a midwife, a nurse, and a medical technician who also served as the sanitary inspector for the area surrounding the center.

The changes in the delivery and organization of health care services also helped transform the relationship between citizens and the state and between communities and healthcare providers. By placing doctors and health facilities even in the most remote areas that had never had access to health services, the new government gave a very human face to its new policies. These local healthcare workers assumed the role of “street-level bureaucrats” acting as intermediaries between the new government and the Cuban public. Michael Lipsky writes of street-level bureaucrats that, “Citizens directly experience government through them, and their actions are the policies provided by government in important respects.”\textsuperscript{38}

For many Cubans living in rural areas in the earliest years of the revolution, contact with one of the rural healthcare workers was their first direct contact with a government representative or official. The changes in the healthcare system not only brought doctors into previously unserved communities and made the state responsible for the health of the population; the new system also institutionalized community participation in healthcare initiatives as a responsibility of all Cuban citizens thereby solidifying the role of the public in public health. When the polio campaigns were launched in February of 1962, Cubans were urged to exercise their fundamental

\textsuperscript{37} Julie M. Feinsilver, \textit{Healing the Masses: Cuban Health Politics at Home and Abroad} (University of California Press, 1993), 32.
rights to receive vaccination free of charge from the state, and also to perform their constitutionally mandated duties by participating in the polio campaign in various ways.

Community participation in public health initiatives was further institutionalized through the establishment of People’s Health Commissions in 1961. Julie Feinsilver writes that the commissions served as liaisons between the community and mass organizations and also helped mobilize community participation through their collaboration with Cuba’s various mass organizations such as the Committees for the Defense of the Revolution (CDRs).³⁹ Cuban scientist Dr. Rudolfo Rodriguez Cruz writes, “Starting with the first campaigns, the advantages offered by the use of the Committees for the Defense of the Revolution (CDR), grass-roots organizations operating on every block in the country, prompted the decision to entrust them with the execution of the polio vaccination campaign.” Rodriguez Cruz explained that, “The extensive coverage of this organization permits contact with the most remote areas of the country, making it possible to complete the vaccination work in a short time at no additional cost.”⁴⁰

Prior to the mass campaigns CDR representatives conducted a basic census in their assigned area to collect a list of names and addresses of all vaccination-aged children in their neighborhood. CDRs were also responsible for registering and keeping track of vaccination information for all of the children in their neighborhood (the neighborhood as defined by the area covered by each CDR). Vaccination cards were filled out for every child and given to parents as proof of vaccination. A copy of the vaccination card for each child was kept by campaign officials and used for the second round of the campaign in order to track the number of children only receiving a single dose of the vaccine and thus requiring follow-up by local health workers.

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³⁹ Feinsilver, *Healing the Masses: Cuban Health Politics at Home and Abroad* 32.
The vaccination cards used during the polio campaigns functioned as a sort of model for tracking vaccination schedules for additional vaccines as Cuba’s national immunization system evolved. Each vaccination card included the following message printed in block letters on the card:

“Illness can be avoided with vaccines. Vaccination is free and can be received in polyclinics and other assistance centers. Getting vaccinated is a revolutionary obligation.”

Educational and Promotional Activities

Different types of training and educational activities targeting different segments of the Cuban population served a critical role in the immunization campaigns. Cuban officials adopted a sort of “trickle-down training” strategy prior to the campaign’s launch to train the largest number of people possible in a relatively short period of time and with limited resources. In addition to his work with the National Antipolio Vaccination Commission, Dr. Karel Žáček gave lectures on various aspects of polio and polio immunization to public health officials, scientists, and campaign leadership throughout Cuba prior to the campaign’s launch. Local medical professionals trained additional auxiliary workers according to guidelines established by the National Commission.

In addition, roughly 3,000 mass organization representatives, who were in charge of the public health activities in their local units, participated in five-day training workshops on polio immunization and various aspects of the upcoming campaign conducted in different locations throughout the country. The 3,000 trainees subsequently returned to their own communities and

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42 This is the same training strategy that the Pan American Health Organization used in the Expanded Program on Immunization later in the 1970s.
trained an additional 50,000 local campaign workers.\textsuperscript{43} This sort of trickle-down training was a key aspect of other mass campaigns in Cuba during this period, most notably the national literacy campaign that took place throughout 1961. Moreover, this basic trickle-down training approach also became a key part aspect of PAHO’s training within the Expanded Program on Immunization (EPI) that will be discussed in greater detail in chapter five.

Another key aspect of the Cuban campaign was the use of the mass media to increase public awareness about the polio campaigns and provide information about polio and the vaccines being used. Radio and television shows were required to mention polio campaigns no less than 30,000 times in the months leading up to and surrounding the campaign. Cuban authorities required that all television programming had to devote at least 12 minutes of programming every day to providing information about the campaigns. Additionally, there were four televised “round tables” focused entirely on the polio campaign, two focusing on technical aspects and two aimed at a more general audience.\textsuperscript{44}

Lastly, radio shows targeting rural audiences were created and broadcast at least 30 minutes a day.\textsuperscript{45} The Cuban Ministry of Health published guidelines for informational broadcasts that included short skits that could be red over the radio. The script provided by the Ministry of Health starts with a worker explaining to a child (a pioneer), “Pioneer, you are the hope of the Nation. You must be healthy and strong and studious. Poliomyelitis is a sickness that attacks children and sometimes leaves them unable to walk. To avoid this, you must go and get vaccinated!” The child in the story responds, “The revolutionary task of liberating Cuba from poliomyelitis won’t be complete until all children get their second dose of the vaccine. Only then can we say to the entire world: Cuba will also be a territory free of polio!” A “young communist”

\textsuperscript{43} Whiteford, \textit{Primary Health Care in Cuba: The Other Revolution}, 72.
\textsuperscript{44} Informe Preliminar, 18.
\textsuperscript{45} Ibid.
chimes in, “Don’t let anyone or anything impede your noble mission. The Revolution has to liberate the children and the young people from the terrible sickness that is poliomyelitis!”

Going to Scale: Immunological Equity as Means and Ends

When the Cuban polio campaign (and national immunization later in 1962) was launched, there was never any question of starting off by immunizing children in some areas but not others, or scaling the program up over time as resources permitted. This was a matter of both principle and pragmatism. Vaccinating some children but not others would have been entirely contrary to Cuba’s revolutionary ideology and the guiding principles of the new revolutionary government. There was no way public health leaders could have justified this to a highly mobilized population that had faith in the revolution’s promises to eliminate Cuba’s longstanding disparities concerning access to basic services and quality of life. Cuba’s polio campaigns, like the national literacy campaign in 1961, mobilized mass community participation using the banner of equity as a rallying cry.

From a purely practical standpoint, immunizing the entire susceptible population was also the only way to ensure the campaign’s ultimate effectiveness and sustainability. Any child or community that remained beyond the reach of the campaigns posed a potential threat to the rest of the population. As will be shown in the Brazilian and Mexican case studies during the 1960s and up through the 1980s, pockets of unvaccinated children frequently led to the reemergence of outbreaks in previously vaccinated populations due to internal population mobility and migration. It should be noted that one of the advantages that Cuba (and indeed other islands) had in this regard was the relative containment of its population and the limited geographical

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46 Informe Preliminar, 53-54.
diversity in the country. Unlike Brazil or Mexico, Cuba didn’t have an Amazon or large and dispersed indigenous populations to contend with. In 1960 Cuba had a population of just fewer than 7 million people and a total territory of 42,000 square miles to cover. Additionally, relative to other countries in Latin America in 1960, Cuba’s population was also more concentrated in urban areas with just over 55% of the total population residing in urban areas.\(^{47}\) Only four other countries had more urban populations than Cuba as of 1960.\(^{48}\) In contrast, in 1960 Mexico and Brazil had populations of roughly 34 million and 70 million and total territories that were (respectively) 46 and 77 times as large in terms of total square millage.\(^{49}\)

**Disease Surveillance and Data Collection**

“There cannot be planning without statistics. If there are no real statistics showing what is actually happening...planning becomes a simple good intention.”

-- Ernesto “Che” Guevara, 1961\(^{50}\)

An essential element of the Cuban polio campaign and all subsequent immunization efforts was directly linked to the Czech polio model and broader changes underway in Cuba during the early 1960s that included an almost obsessive focus on data collection to drive all public policy and planning efforts.\(^{51}\) By the end of the 1950s, Czechoslovakia boasted one of the world’s strongest and most comprehensive disease surveillance systems developed in large part by Dr. Karel

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\(^{48}\) These countries (with the percentage of the population residing in rural areas) included: Argentina (27.4%), Chile (36.2%), Uruguay (26.0%), and Venezuela (37.1%). Mexico ranked sixth in Latin America just behind Cuba with a rural population of 46% in 1960. Data from, “Health Conditions in the Americas, 1965-1968,” 3.


\(^{51}\) In 1961 Cuban officials sought to more or less adopt the Soviet (and Czech) strategy of "centralized planning" that was extremely reliant on massive amounts of data and statistical reports to guide and justify planning in a wide range of areas. This shift in within the government helps explain Cuba’s early priority for data collection and surveillance to drive health system and policy development.
Raška, a leading international figure in epidemiological surveillance who subsequently advised Cuban public health officials in the early 1960s. Dr. Karel Žáček, who advised Cuban public health officials in developing the campaign, was one of Raška’s students.

Thanks in part to the advisory role played by Czech scientists and health officials, disease surveillance and data collection were among the most significant and important aspects of the Cuban polio campaign from its inception and subsequently have been the cornerstones of all public health initiatives carried out on the island since 1959. When Cuban authorities decided to target polio in late 1959, they made data collection and epidemiological surveillance their first priority. Dr. Karel Žáček assisted Cuban public health officials with serological and epidemiological studies that provided the basic epidemiological information needed to plan the national campaign. While in Cuba Žáček also trained Dr. Pedro Mas Lago, a Cuban virologist who was appointed to direct Cuba’s National Virology Institute. Mas Lago also received training in the Soviet Union under the direction of Dr. M.P. Chumakov, Dr. Sabin’s key collaborator in the live polio vaccine research and studies conducted in the Soviet Union in the late 1950s.

In collaboration with Cuban public health officials, Dr. Žáček helped to set up Cuba’s national polio surveillance system prior to the campaign’s launch in February of 1962. For an entire year prior to the launch of the first polio campaign, Cuban health authorities worked to build a national polio surveillance system in consultation with Dr. Žáček, and used the information collected to conduct epidemiological studies to determine which groups were most at risk of contracting polio. Additionally, surveillance efforts involved the community with community organizations, rural health service workers, and representatives from mass organizations, enlisted to help collect census data to determine which households had children
within the identified target group. Subsequent campaigns relied on surveillance and reporting from local health authorities back to national health officials, whereby strategies could be revised and more efficient methods of age distribution and disease incidence reporting developed.

The data generated by Cuba’s surveillance system was verified by international observers on numerous occasions and served multiple functions. Consistent monitoring and evaluation of the program, and also making the results available to external observers such as PAHO, helped to increase international confidence in the Cuban model and its potential. Domestically, the data collected about polio incidence before and after the campaigns demonstrated the impact of the program to local communities that subsequently increased domestic support for future campaigns. Data was also used by domestic public health officials in order to adjust the program and make more efficient use of limited resources by refining the scope of the target population covered by the campaigns. The early integration of evidence into policymaking and the use of data generated by domestic researchers to adapt the program as it evolved was a significant aspect of the Cuban program. It was also an area where Cuba stood apart from many other countries in Latin America during this time period, and where Cuba shared something in common with Mexico where a similarly early integration of evidence was also influential in polio campaigns as will be seen in the Mexican case study later in this chapter. Availability and reliability of data and surveillance capacity and integration of evidence into policymaking were among the major obstacles in other countries during the 1960s and throughout the 1970s and early 1980s, and presented some of the greatest challenges constraining effective policy implementation.

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53 Ibid., 683.
As will be discussed in the following case studies on Brazil and Mexico, and in subsequent chapters, there was a sort of “catch 22” concerning disease surveillance in other countries in Latin America during this period of time, where Cuba had a distinct advantage. Surveillance and the completeness of reporting data were in part conditional on the scope of the existing health system. A common problem concerning surveillance capacity throughout Latin America during the 1960s and 1970s concerned the limited scope of the existing health systems of which they were a part.

When Cuba first developed a national polio surveillance system pursuant to the launch of nationwide polio immunization campaigns, the establishment of the surveillance system was linked to broader changes taking place within the health sector aimed at expanding the health system to reach the entire population, including rural and hard-to-reach populations. Additionally, Cuban public health officials relied on existing mass organizations including the Committees for the Defense of the Revolution (CDRs) to collect basic census information through house-to-house surveys designed to compile information on households with vaccination-aged children throughout the entire country. Additional support for Cuba’s surveillance system came from the Rural Health Services initiative, which was launched immediately prior to the polio immunization campaigns (discussed in the following sections). As part of the initiative small teams of public health officials were sent to previously unreached communities. One of their first responsibilities was to collect census information about the population they were intended to serve in order to establish a basic health map for their specific area. The concurrent changes in the national health system, the availability of mass organization to conduct community-level censuses, the external assistance of Czech advisors who helped create the national system, and Cuba’s preexisting capacity linked to disease surveillance which
was already stronger than most countries in Latin America by 1959, enabled the creation of a strong and comprehensive disease surveillance system in Cuba in the early 1960s.

Cuba Case Study Summary

In February of 1962 Cuba launched what ultimately became the most effective polio immunization campaign in contemporary public health history. Within a single year of the launch of the first round of national immunization days, Cuba effectively interrupted domestic circulation of polio becoming only the second country in the world, and the first in the Americas, to successfully eliminate polio. While the Cuban model was initially slow to spread to other countries in the region, ultimately, the core elements of the Cuban model were adopted and adapted in countries throughout the region resulting in the regional elimination of polio in the early 1990s. The core aspects of the Cuban campaign that helped explain its effectiveness were initially attributed by some (especially officials within the United States) as being overly dependent on Cuba’s communist political structure and the enforcement capacity of Cuba’s military regime. However, the key aspects of the Cuban campaign that helped explain its effectiveness were primarily linked to a range of domestic conditions in Cuba that increased Cuba’s domestic implementation capacity.

First, when the polio campaigns were launched in Cuba, Cuba already had a stronger basic health system infrastructure than most other countries in the Americas. Although the existing health system was extremely unevenly distributed and heavily biased towards urban areas, so too was the Cuban population in the early 1960s. Basic infrastructure existed that the new Cuban revolutionaries could build upon in developing a more equitable and accessible
system. Building on existing domestic health system capacity, Cuban leadership prioritized strengthening the central government’s stewardship capacity starting in 1959, which, as defined by the WHO, included, “setting and enforcing the rules of the game and providing strategic direction for all the different actors involved.”54

As part of the existing system, Cuba’s basic surveillance capacity was also better than most other countries in the region by 1959. When Cuban public health officials presented at the first and second live poliovirus vaccines conferences hosted by PAHO in 1959 and 1960, they had a comparatively sophisticated disease portrait of polio incidence in Cuba going back several decades before the Revolution. The post-1959 initiative was able to build off of existing capacity with a renewed emphasis on equity and universal access.

Second, when the polio campaigns were launched in Cuba, Cuban public health officials had the advantage of having an extremely mobilized population and highly active (and supportive) mass organizations to call upon to help with the campaign. Cuba’s recent experience with mass mobilizations linked to the National Literacy Campaign completed the year before had provided a foundation for subsequent mobilizations, including, but not limited to, the polio campaigns.

Third, the authority and responsibility of the national government related to public health, was enshrined in virtually every official document laying out the overarching platform of the new revolutionary government immediately post-1959. Healthcare and access to services was a right of all Cuban citizens and a responsibility of the new Cuban state to provide. This was an essential component of the new social contract in Cuba, along with the responsibility that Cuban citizens had to support public health initiatives and participate in a range of public health programs. Accordingly, the Cuban government had the authority to enforce public health policies.

but also the responsibility to make interventions accessible to the entire population, especially populations that had been excluded by previous governments. Vaccination was simultaneously framed as a right and a duty of all Cuban citizens.

Fourth, the polio campaign was launched during a period of significant cultural and institutional change in Cuba that facilitated their development and effective implementation. The concurrent transformation of the health system underway in Cuba in the early 1960s created space for Cuban public health officials to innovate and try new ideas. The context and resource limitations in the early 1960s also created greater incentives for inter-institutional collaboration and coordination between the health sector and other actors and institutions. This collaboration became a hallmark of not only the Cuban polio campaign but of the health sector more broadly, and was, in part, born out of necessity and resource shortages of the early post-revolutionary period.

Lastly, one of the most important factors helping to explain the dramatic results and the sustainability of the Cuban polio program was its universal scope from the start. The Cuban campaign placed equity and access at the forefront and used them as a rallying cry to mobilize communities. In so doing, the polio campaign established an important precedent for all subsequent immunization initiatives and Cuba’s National Immunization Program launched later in 1962. Immunological equity was viewed as both a means and end of the overall program. The polio program helped institutionalize this element by demonstrating that universal access to basic interventions was important on both ideological and epidemiological grounds.
Changing International Context and the Cuban Campaigns

The earliest years of the Cuban Revolution clearly demonstrate that Cuba was committed to international health cooperation and conscious about the regime’s reputation within international health organizations. In 1960 Cuba hosted the annual meeting of PAHO representatives in Havana and took the opportunity to showcase public health initiatives being promoted by the new government. Dr. Pedro Noguiera, the Cuban representative to PAHO at the time, was a holdover from the Batista government and continued to represent Cuba within PAHO during the early 1960s. He played a critical role in ensuring that relations between the new Cuban leadership and PAHO leadership were unproblematic.55

Ultimately, PAHO was the only regional organization that Cuba was not kicked out of or suspended from post-1959, accordingly, Cuba’s reputation, status, and relationships within the Organization were extremely important to the new government.56 The PAHO’s relationship with Cuba post-1959 was similarly important to the Organization’s development in that it helped to establish an important precedent at PAHO: membership in PAHO was unconditional and unrelated to the type of political system a country had. This principle was essential in influencing the role that PAHO played in the region during the decades of the 1970s and 1980s - political instability was high and fluctuations in regime-type in many countries were frequent - and was institutionalized in 1962 thanks to an issue concerning Cuba and linked to polio.

In mid-August of 1962, reports of a polio epidemic in Cuba began circulating in U.S. newspapers. The reports were largely linked back to exiled Cuban doctors living in the United

55 For more on Cuba’s relationship with PAHO immediately post-1959 see Cueto (2006): 102-104
56 There is a very interesting history of Cuba’s leadership role within the American Public Health Association (APHA) dating back to the late 1800s. Cuba and Mexico are the only Latin American countries to have been members and both were extremely active throughout the first half of the 1900s. Cuba was expelled from the APHA in 1961 which served to reinforce PAHO’s position that public health and politics should be kept separate from one another. See A. E. Birn and A. M. Carrillo, "Neighbours on Notice: National and Imperialist Interests in the American Public Health Association, 1872-1921," Canadian Bulletin of Medical History 25, no. 1 (2008).
States who claimed that the Russian vaccine used in the recently completed second round of Cuba’s national polio campaign had produced “serious side effects” in Cuba including paralysis. The Cuban government responded in a series of radio broadcasts in which government officials accused the United States of spreading misinformation to sabotage Cuba’s reputation within international health circles. The timing of the reports was a bit too convenient: the Pan American Sanitary Conference (PAHO’s primary decision making mechanism held every four years) was set to meet in just over a week with Cuba’s continued participation in the Conference rumored to be in jeopardy. According to Cuban officials, “imperialists” in the United States were circulating the false reports “as part of a preparatory campaign by the Yankee government towards its goal of having our country [Cuba] separated from the Pan American Health Organization.”

Cuba had recently been expelled from the Organization of American States (OAS) and the Inter-American Defense Board, so it was logical to assume that PAHO might be next.

The relationship between PAHO and the Organization of American States (OAS) is akin to the WHO’s relationship to the United Nations. Technically, both PAHO and the WHO are “specialty agencies” of the OAS and UN. In 1950, PAHO and the OAS signed an agreement outlining their relationship that essentially maintained PAHO’s autonomy but stated that PAHO would “take into account” recommendations by the Council of OAS. In January of 1962 when Cuba’s OAS membership was “suspended” by a vote of the OAS Council, the PAHO-OAS cooperative agreement meant that suspending Cuba’s PAHO membership should automatically be placed on the agenda for the 1962 PAHO Sanitary Conference.

57 “Polio Epidemic Denied by Cuba,” Ocala Star-Banner, August 19, 1962
The prospect of having a country kicked out of an international health organization was alarming for many public health leaders in the hemisphere and within both PAHO and the WHO based on the precedent that might set and the harm it could do to international progress in combating diseases. This issue was first raised and addressed within the WHO when the Soviet Union and China withdrew from the WHO shortly after its establishment based on disagreements concerning the model of health and development espoused by the Organization. As a result, public health data wasn’t available for international health initiatives from two of the most populous countries in the world.

In order to avoid forcing the PAHO Council to “take into account the recommendations by the Council of OAS” the recommendation to suspend Cuba’s participation in the inter-American public health system had to be kept off of the agenda at the 1962 PAHO Conference scheduled to take place at the end of August in Minneapolis, Minnesota. And it was, thanks to a last-minute negotiation that took place whereby Dr. Marcolino Candau, the Director General of the WHO (a Brazilian who once worked for the Rockefeller Foundation in Rio), intervened and convinced senior level officials within the United States government to drop the issue and withdraw the item from the PAHO conference agenda. As a result there was never any vote on Cuba within PAHO and the proposal to expel Cuba from the Organization disappeared.

PAHO’s commitment to working with all governments in the hemisphere regardless of their political ideologies or governing institutions was extremely important throughout the regional polio eradication campaign in the 1980s and enabled PAHO to provide support for immunization initiatives in volatile political environments linked to civil wars and major political transitions.

Brazilian Implementation Attempts: 1961-1964

Brazilian public health officials adopted the Salk polio vaccine in 1956 after which point it was used on limited basis primarily in São Paulo and Rio de Janeiro between 1956 and 1958. The Salk adoption decision was heavily influenced by series of events and a convergence of factors. First, a polio epidemic in neighboring Argentina in early 1956 began making headlines in Brazilian newspapers sparking fear of an epidemic in Brazil. Brazilian President Juscelino Kubitschek acted on the advice of the Minister of Health adopting the Salk vaccine as a preventive measure to protect against a possible epidemic (even though the Salk vaccine was not proven to be effective when administered in the midst of or in the face of an impending epidemic). Second, a delegation of leading Brazilian pediatrics experts attended an international conference in Copenhagen in mid-1956 where information about the Salk vaccine and its effectiveness (when used in advanced industrialized countries) was presented. Third, the United States eased some of the export controls on the Salk vaccine to select countries, one of which was Brazil, which made it possible for Brazilian public health officials to purchase limited supplies of the vaccines.

It is important to note that none of the factors influencing the Salk vaccine adoption included evidence that the vaccine would be an effective prophylactic measure in Brazil based on a combination of epidemiological and contextual factors common to other Latin American countries and discussed in the previous chapter. Polio epidemics continued throughout the remainder of the 1950s (including in the areas where the Salk vaccine had been piloted).

During this period of time a significant amount of new evidence and experience related to the alternative live oral polio vaccine became available which, in combination with several other
factors, including a change in political leadership, helped to create a window of opportunity for the live vaccine in Brazil. The election of Jânio Quadros at the end of 1960 signaled a major, if ephemeral, shift in Brazilian foreign policy, especially with regards to Brazil’s relationship with the United States relative to the rest of the developing world. Clara Nieto characterizes Brazilian foreign policy under Quadros as, “third world, leftist, and independent.” Quadros raised eyebrows and cause for alarm in Washington with his seemingly pro-communist sympathies demonstrated by a visit to Cuba prior to his inauguration and efforts to increase economic ties with the Communist world. The shift in Brazil’s international relations is apparent in official documents from the Ministry of Health concerning the decision to abandon the Salk vaccine in favor of the live oral polio vaccine developed by Albert Sabin in early 1961.

In March of 1961, Brazil’s National Health Department established a Special Commission to make recommendations about the live vaccine to the Minister of Health. The Special Commission included leading Brazilian scientists and public health officials and prepared a detailed report recommending that the live vaccine should be adopted without further delay and outlining a proposal for its widespread use. In addition to citing evidence provided by PAHO and the work of PAHO’s polio advisor (Mauricio Martins da Silva) the Special Commission’s report cited the experience of communist and developing countries as having been influential in the Ministry’s decision. The Commission Report stated:

> In view of a careful analysis of the work of vaccination with modified live virus carried out under the orientation of the World Health Organization, and of the work done in Russia, where the method has been widely used; and in consideration of an ample literature setting forth the results of experiments carried out in various countries, where tens of millions of children have already been vaccinated; the commission judges that the

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61 Clara Nieto, *Masters of War: Latin America and United States Aggression from the Cuban Revolution through the Clinton Years* (Seven Stories Press, 2003), 163.
62 Ibid., 163-64.
time is ripe to begin oral vaccination against poliomyelitis in Brazil, using modified live virus.\textsuperscript{63}

The explicit mention of the work done in Russia is particularly significant in light of the political atmosphere linked to the Cold War and its spillover into the polio vaccine debates in the United States during this period.

In March of 1961, while Brazil’s Special Commission was busy drafting its report on the Sabin vaccine for the Brazilian Ministry of Health, back in Washington, DC, Dr. Albert Sabin was testifying before the House Commerce Subcommittee warning members of Congress that the Soviet Union could use the oral polio vaccine as a “cold war weapon” if the United States continued to delay licensing and production of the vaccine.\textsuperscript{64} Representative Kenneth Roberts, a Democrat from Alabama and the chairman of the subcommittee, suggested that the Soviet Union’s lead in producing the oral vaccine could be used to, “win friends among uncommitted nations.”\textsuperscript{65} Dr. Sabin agreed explaining that polio was becoming an increasingly important problem in many tropical and subtropical nations that could not afford the Salk vaccine thus leaving them no other option but to turn to the Soviet Union for assistance.\textsuperscript{66}

Dr. Sabin learned of the Brazilian Special Commission’s oral polio vaccine adoption decision before the official report had been delivered to the Minister of Health. On April 5, 1961, Dr. Sabin received a handwritten note signed by all the members of the Special Commission informing him of the Commission’s decision and thanking him for his, “most valuable

\textsuperscript{63} Special Commission Report from April 6, 1961. ABS Archives, Sub: Correspondence, 1954-1986 (B1F7)
\textsuperscript{64} Sabin’s testimony is on March 17, 1961.
\textsuperscript{66} In March of 1961 President Kennedy authorized a shipment of the Salk vaccine to be sent to Cuba in response to reports of an outbreak in Guantanamo province. The Cuban government publicly attacked the United States claiming that the vaccines had been sent as a propaganda effort and denying the existence of an outbreak. Polio vaccines were also included in the shipment of supplies sent to Cuba as part of the prisoner exchange in the aftermath of the Bay of Pigs invasion. Cuban officials returned the Salk vaccines included in the shipment back to the United States claiming they had no use for the Salk vaccine given the impending launch of their national polio campaign using the live oral polio vaccine supplied by the Soviet Union.
cooperation in this matter." In view of the fact that the live oral polio vaccine had not yet been licensed in the United States, Dr. Sabin took the opportunity to alert U.S. officials of the Brazilian decision. On April 15, 1961, Dr. Sabin wrote to Dr. Arnold B. Kurlander, the Assistant Surgeon General of the United States to inform him that not only had Brazil adopted the live vaccine, but also the Brazilian government was preparing to launch a national polio campaign using the vaccine in the near future. The Assistant Surgeon General responded several days later writing, “It is indeed thoughtful of you to keep us informed.”

After the adoption decision made by the Ministry of Health, mass immunization campaigns were scheduled to begin in June and July of 1961. While the mass immunization campaigns appeared to be successful between 1961 and 1963, the success was short-lived and campaigns were largely abandoned within three years of the initial program’s launch. There were several key factors that ultimately constrained Brazilian implementation attempts in the early 1960s. First, Brazil’s public health precedent included longstanding tensions between national and subnational authorities concerning the roles and responsibilities of the different actors involved which complicated policy implementation and limited cooperation between national and subnational actors. Second, the stewardship functions of the central government and Ministry of Health were extremely weak, especially concerning the capacity of the national Ministry of Health on issues of program development, planning, and implementation. The health system was further limited by weak and often-nonexistent data collection and disease surveillance, and the failure to include available information in policymaking. Stewardship during this period was severely constrained by political and administrative stability that resulted

67 Note to Albert Sabin on April 5, 1961. ABS Archives, Sub: Correspondence, 1954-1986 (B1F7)
68 Letter from Albert Sabin to Arnold Kurlander, April 15, 1961. ABS, Sub: Correspondence, 1954-1986 (B1F7)
69 Letter from Arnold Kurlander to Albert Sabin, April 20, 1961. ABS, Sub: Correspondence, 1954-1986 (B1F7)
in frequent turnovers within the Ministry of Health and a range of health research and training institutions throughout the country.

Beyond national health system capacity related to stewardship, polio initiatives were constrained by inadequate subnational health system capacity and variation in capacity across Brazil’s states and municipalities, which created enormous disparities across and within states in terms of access to basic services. Third, changes in Brazil’s foreign relations contributed to changes in Brazil’s national health policy agenda. As Brazilian authorities sought to align themselves more closely with the United States, they also sought to align Brazil’s national health priorities to the priorities supported by the United States and other international organization; priorities that did not include polio during the second half of the 1960s. These different factors, and the ways in which they interacted with one another, are examined in the following Brazilian case study.

Public Health Precedent and Stewardship: Who is responsible for health?
Throughout Brazilian history, public health initiatives have been at the mercy of the country’s longstanding ambivalence concerning the relative balance of powers and responsibilities of national versus subnational authorities. The polio immunization campaigns in the early 1960s were no exception. Many of the issues linked to Brazil’s public health precedent that affected public health programs were related to the concept of stewardship. The federal government had the authority to pass national legislation regarding some public health measures and state intervention targeting certain specific diseases, however which health issues and diseases and on what grounds were poorly articulated and subject to change at random. Additionally, central government and Ministry of Health had virtually no authority or institutional capacity to implement or enforce policies beyond the capital or major port cities.
According to a report written by advisors from the International Cooperation Agency (the precursor to the U.S. Agency for International Development, USAID), the Brazilian Constitution of 1946 allocated responsibility for the provision of health services to state and municipal governments, yet, as of 1960 there was no clear delineation of responsibilities or institutionalization of the constitutionally mandated division of powers between national and subnational units.\(^{70}\) The ICA review continued, “Moreover, insufficient time has elapsed since the 1946 constitution for clear-cut jurisdictions to evolve, and the residual structure from earlier periods determines, probably more than the constitutional authority, where the responsibility actually resides.”\(^{71}\) Brazilian public health precedent suggested that state authorities could carry out public health initiatives according largely to their own interests, with limited intervention or support from the federal government.

Gilberto Hochman’s superior work on smallpox and the Brazilian public health agenda provides numerous valuable insights concerning how Brazilian public health precedent influenced policy response to smallpox that are similarly germane to polio during the late 1950s and early 1960s. Hochman explains that during the Vargas administration (1930-1945) things like smallpox (and other) vaccine production and vaccination were left up to state and municipal authorities.\(^{72}\) Hochman states:

> Any effort to enlarge vaccination coverage depended entirely on the initiative of state and local governments, which usually had other priorities or lacked technical and financial means to produce or purchase vaccines to deliver routine vaccination. The federal government co-operated technically and supported the supply of immunizers only in an insufficient and erratic manner.\(^{73}\)


\(^{71}\) Ibid.


\(^{73}\) Ibid., 238.
He notes that the BCG (used in tuberculosis prevention campaigns) and yellow fever vaccines were exceptions and were the responsibility of the Federal Government.\(^7^4\)

In general, the Federal Government only assumed a modicum of responsibility for diseases or health issues deemed to be of utmost national importance (usually those diseases targeted by international actors or that most directly affected Brazilian economic interests such as yellow fever or malaria).\(^7^5\) These programs were typically highly centralized and vertically structured, preventing subnational authorities from adapting programs to better suit local needs, but still requiring them to shoulder much of the responsibility for executing campaigns.\(^7^6\) The Brazilian government’s approach to polio in the early 1960s (and early 1970s) was very similar as will be demonstrated in the following sections.

Among the recommendations made by Brazil’s live polio vaccine commission in April of 1961, was for the Ministry of Health to request advisory assistance in planning the proposed immunization campaign from PAHO’s polio advisor, Maurício Martins da Silva, and live vaccine developer, Dr. Albert Sabin. Dr. Sabin had actively collaborated with the commission during its deliberations over adopting the live vaccine and was quick to accept the invitation. He arrived in Brazil in June of 1961. According to a report from the Brazilian Ministry of Health, “It was thought that discussions on his [Sabin’s] part with the national technicians responsible for the subject might result in improving the orientation to be followed in the vaccination campaign.”\(^7^7\) The following month, Dr. Maurício Martins da Silva arrived in Brazil on July 9,

\(^{74}\) Ibid.
\(^{75}\) Ibid., 239.; when the National Department of Rural Endemic Diseases (DNERu) was created in 1956 it included a list of diseases deemed to be of national importance that did not include either smallpox or polio. This meant that states and not the federal government would continue to be in charge of both for the time being.
\(^{77}\) Bichat Rodrigues, Getulio Lima Junior, and Joaquim Travassos da Rosa, "Campaign against Poliomyelitis in Brazil," (Brazilian Ministry of Health, 1963), 4.
1961, to help plan a demonstration project involving the live polio vaccine in Santo André in the State of São Paulo.\textsuperscript{78} It is important to note that state authorities from São Paulo negotiated the collaborative agreement to launch the pilot project directly with PAHO officials, largely bypassing the Federal Government or Ministry of Health. This is an example of the limited capacity of the Ministry of Health and the significant amount of autonomy exercised by state authorities.

While the pilot project in the State of São Paulo was carried out largely by state health authorities in collaboration with PAHO and without the direct involvement of the Ministry of Health, the national Ministry of Health launched its own pilot program (also in collaboration with PAHO) in Petrópolis outside of Rio de Janeiro. The Ministry of Health intended to use the pilot program as a demonstration of the strategies that would subsequently guide implementation in other states as the program was scaled-up. The collaborative work done by PAHO and Brazilian public health officials was prototypical of the basic menu of technical cooperation provided by PAHO throughout the 1950s and early 1960s. The focus was on sending short-term consultants to advise domestic public health officials in the design and initial implementation of a pilot program or demonstration project that would then be left up to domestic officials to assume responsibility for and scale up to cover larger portions of the population.

The approach focused on demonstration effects had been developed during Dr. Fred Soper’s tenure as director of the Organization and was a direct holdover from his decades of work with the Rockefeller Foundation’s International Health Division. The IHD promoted demonstrations with the idea that the demonstrations could be used to show the effectiveness of a

\textsuperscript{78} Ibid., 3.
given intervention and then adopted and adapted beyond the initial demonstration areas and taken over by local communities and public health officials.79

Once the first pilot program in Petrópolis was completed, individual states were “invited” to consider and initiate the vaccination plan recommended by the Ministry of Health. Based on the limited authority and capacity of the Ministry of Health, the Ministry had no real influence over subnational units to ensure that the program was adopted or implemented. This stands in contrast to the situation in Mexico where the federal government’s stewardship role was more clearly established giving the Secretariat of Health the authority and responsibility for immunization campaigns throughout the entire country with the expectation that state and municipal authorities would support preventive efforts. Additionally, the state-level authorities in Brazil who accepted the Ministry’s invitation to participate in the polio program would be solely responsible for executing the campaign in their respective states as well as mobilizing their own resources to support the program beyond the first dose of the vaccine that would be provided by the Ministry of Health.80

Beyond the first dose of the vaccine, the Ministry of Health determined its responsibilities to include providing technical advisory services to states, and the basic plan for development of the campaign, “which was to be adjusted to local conditions.”81 The following series of events that occurred in Brazil shortly after the program was launched illustrates one of the ways in which the tensions between national and subnational authorities, and weak stewardship capacity of the Ministry of Health in terms of establishing programmatic norms and guidelines, directly affected polio campaigns.

81 Ibid.
The State of Guanabara was among the first states to accept the Ministry of Health’s invitation to participate in the polio immunization campaign in mid-1961. State health authorities received 530,000 doses of the Sabin vaccine to cover the first (out of a total of two) rounds of immunizations scheduled for October 16-21, 1961. According to a report from State Health Secretary Marcelo García, 420,000 children from 4 months to 6 years were vaccinated during the first round of the campaign representing more than 80% of the target population according to a 1960 census conducted in the State. Based on these results, vaccinations were ultimately extended for an additional four days reaching a total of 432,840 or 92.5% of the target population. After receiving Dr. García’s report, Dr. Albert Sabin replied by telegram stating: “Congratulations on success of your oral polio vaccine campaign. May this become a model for all Brazil and mark the beginning of the complete eradication of polio in your country.”

While the campaign was getting underway in Guanabara, a polio outbreak was reported in Fortaleza, the capital of the State of Ceará. After calling in PAHO consultant Dr. Hanna Doany to assess the situation, officials within the Ministry of Health decided that additional action was needed on the part of the Federal Government to assist state authorities in mounting an effective response to control the epidemic. In the aftermath of the Fortaleza outbreak, the demands from state authorities that now wanted to participate in the polio campaigns increased dramatically and rapidly; too rapidly for the Federal Government to accommodate. As a result, officials within the Ministry of Health decided to revise the programmatic guidelines initially established by the Ministry of Health for the campaigns, redistribute available immunization resources, and adjust the technical support provided to other states accordingly.

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82 The State of Guanabara no longer exists and is now part of the State of Rio de Janeiro as of the early 1970s.
83 Letter from Marcelo García to Albert Sabin, November 6, 1961. ABS Archives, OPV, Correspondence, B1F7 (Brazil 1958-1967)
84 Night telegram from Albert Sabin to Marcelo García, October 28, 1961. ABS Archives, OPV, Correspondence, B1F7 (Brazil 1958-1967)
This meant that some states, like the State of Guanabara where the Ministry of Health had promised a second dose of the polio vaccine, would no longer receive the promised second dose. Instead, the Ministry of Health opted to provide first doses to a greater number of newly adopting states. These changes were made without consulting or even informing state health authorities in a systematic or timely way. According to State Health Secretary Marcelo García, the result was a “real war in our public health world.”

The war started with a miscommunication between Albert Sabin and Brazilian pediatrics expert, Dr. José Martinho da Rocha. Upon learning of the vaccine shortages at the Ministry of Health, da Rocha contacted Dr. Sabin to request his advice. Given the present shortages, would it be better to administer a single dose of the vaccine to a larger number of children, or stick with the original plan to administer the full two-dose series, even if this meant limiting the scope of the campaign. The difference between one or two doses wasn’t trivial. Two doses had been proven to produce sufficient immunity, one dose had not. Dr. Sabin was under the impression that the Ministry was in the process of securing additional vaccines, and thus responded via telegram that it would be better to administer the first dose to as many children as possible now, and follow up with a second dose as soon as the additional vaccines were available. Upon learning that the vaccine shortage wasn’t temporary, Dr. Sabin quickly clarified: a second dose was absolutely necessary to ensure sufficient immunity and could be delayed for at most a few weeks. However it was too late and the damage had already been done. The Ministry of Health used Sabin’s statement (including publishing it on the front page of leading newspapers) as justification to change the program. States who had already received a first dose would not be receiving a second.

85 Letter from Marcelo García to Albert Sabin, January 10, 1962. ABS Archives, OPV, Correspondence, B1F7 (Brazil 1958-1967)
Guanabara’s State Health Secretary, Marcelo García, learned about the Ministry’s decision and change in policy four days before the second round of immunizations was scheduled to take place in his state. He had four days to figure out how to vaccinate over 400,000 children and no vaccine. He explained the situation in an urgent telegram to Dr. Sabin. “No previous warning, no communication, nothing was done in order to give us time to provide for the vaccine.” Dr. García accused the Minister of Health of being irresponsible; noting that the Minister’s public change in plans could confuse the general public and cause people not to bring their children to be vaccinated. Dr. García reported, “After a real war in our public health world,” the Minister of Health had finally agreed to a compromise. The Ministry would provide half of the total vaccine doses for free as promised. The Ministry would provide the other half “on loan” that the State of Guanabara would have to repay.\textsuperscript{86} Dr. García closed his letter to Dr. Sabin stating, “The actual situation is in a real mess and state of confusion (in public opinion of course)...a clear statement based on scientific evidence from you is indispensible to put all things on the tracks.”\textsuperscript{87}

Ultimately, Sabin responded clarifying his remarks and sending a telegram to a newspaper in Brazil stating that, contrary to what the (now former) Minister of Health had claimed, two doses of the polio vaccine were absolutely required. This example illustrates the weak authority and capacity of Brazil’s Ministry of Health on issues of program planning, establishing overarching policy guidelines, and coordinating with subnational health authorities. More specifically, this example demonstrates the weakness of the stewardship functions provided by the Ministry of Health.

\textsuperscript{86} Letter from Marcelo García to Albert Sabin, January 10, 1962. ABS Archives, OPV, Correspondence, B1F7 (Brazil 1958-1967)
\textsuperscript{87} Letter from Marcelo García to Albert Sabin, January 10, 1962. ABS Archives, OPV, Correspondence, B1F7 (Brazil 1958-1967)
Variation in Subnational Implementation Capacity

An additional issue that prevented more effective implementation and institutionalization of the polio campaigns in the early 1960s (and early 1970s) concerned subnational variations in institutional capacity required to implement and institutionalize immunization programs. Responsibility for executing polio immunization initiatives was delegated to state and municipal authorities without any attention to the significant variation concerning health system capacity and available resources for health in different states and municipalities throughout Brazil.

Albert Sabin and Brazilian pediatrics expert José Martinho da Rocha discussed the issue of variation in local capacity when they met at the American Academy of Pediatrics meeting in Washington on April 13, 1961. During their meeting Dr. Sabin stressed the need for continued immunization of infants beyond the mass immunization campaigns to avoid future outbreaks. In a memo of their conversation Sabin wrote, “It is realized that the administrative aspects of this phase of the program [continued immunization of infants beyond mass campaigns] must depend to a large extent on the facilities that are available for reaching children during the first 6 months of life in a particular region.”

The following comparison of the States of São Paulo and Minas Gerais (home to one-third of the total Brazilian population of roughly 70 million people in 1960), in terms of the resources available to public health officials and existing local-level capacity helps to illustrate the significant subnational variation in Brazil during this period of time that influenced domestic program implementation.

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88 Memo of conversation between José Martinho da Rocha and Albert Sabin on April 13, 1961. ABS Archives. Correspondence, OPV International B1F7 (Brazil-1958-67)
When the first pilot polio immunization campaign involving the live polio vaccine was launched in Brazil in 1961, it was launched in the State of São Paulo and carried out primarily by state health authorities in collaboration with PAHO staff. The campaigns were conducted relying on the pre-existing capacity and resources of the State. São Paulo has historically been a major outlier in Brazil in terms of its relations with the Federal Government and its own state-level resources and institutional capacity. In 1957, spending on health in São Paulo was an estimated 266.40 cruzados per capita, as compared to health spending in the poor and heavily populated Northeastern State of Ceará where per capita spending was roughly 18.60 cruzados.90

By 1960 expenditures had risen (primarily as a result of inflation) and per capita spending on health for the State of São Paulo was an estimated 400 cruzados. In the remainder of the states across Brazil (where over half of the total per capita spending came from the Federal Government), healthcare spending averaged 40-50 cruzados per capita.91 Additionally, the State of São Paulo’s health budget for 1960 was slightly larger than the total health budget of the Federal Ministry of Health.92 The significant resource advantage in São Paulo meant that the state wasn’t dependent on the Federal Government for support to conduct immunization campaigns (or other health programs).

Throughout the duration of the polio immunization campaigns conducted in 26 state capitals and the Federal District in 1961-1962, the Federal Government provided a total of roughly 4.5 million doses of the Sabin vaccine to state authorities.93 During this same time period, the State Government of São Paulo used its own budget to provide 4 million doses of the

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90 Ibid.
91 Ibid.
92 Ibid.
Sabin vaccine for immunization campaigns in the State. 94 As of 1960 state authorities in São Paulo had established health centers in the majority of the municipal *sedes* (county seats) and “sub-posts” in areas with more than 3,000 people. 95 These centers and sub-posts could be used to access the majority of the population during the vaccination campaigns. This stood in contrast to the situation in the State of Minas Gerais where local implementation capacity was much weaker.

During the 1961-1962 polio campaigns conducted in Minas Gerais, the Federal Government provided a total of 225,000 doses of the Sabin vaccine to state authorities, which were supplemented by an additional 400,000 doses provided by the State. This meant that even though the two states had similarly large populations, the State of Minas Gerais had roughly 13.5% of the total amount of vaccines to run their polio immunization programs as compared to the total vaccines available in State of São Paulo during the same time period. 96 An additional implementation constraint in Minas Gerais that was not as salient in São Paulo, concerned population density. The State of São Paulo was only a little over two-fifths the size of Minas Gerais in terms of landmass covered by the two states, but both states had roughly the same number of municipalities. The significantly larger municipalities in Minas Gerais (584 square miles compared to an average of 259 square miles in São Paulo) created additional challenges concerning the distribution of public services and extending access to services among highly dispersed populations. 97 In contrast to São Paulo, where health centers and sub-posts were established more or less consistently throughout the State in the majority of municipalities,

94 Ibid., 11.
Minas Gerais had roughly 400 municipalities in 1960, but only 27 health centers and 214 sub-posts serving the entire state. Of those 214 sub-posts it was estimated that 60 were without physicians and “virtually non-operative.”98 The ICA review stated that, “In most other states the health center program is even less impressive.”99

The ICA review concluded its evaluation of the situation in Brazil with an assessment of Brazil’s existing health system stewardship and its direct implications for the health sector. The review stated:

We believe that the division of responsibility for public health services leaves much to be desired. True, there are real limits on funds and corps of skilled personnel, but major improvements in service could still be made, were there changes in organization and administrative procedures. Such changes have assumed the air of being impossible because of the current attitudes of helplessness among all levels of government and the people concerned. We believe these attitudes have developed because of the chain of dependency of state governments upon the federal government for funds and of the local governments upon states for services.100

Political and Administrative Instability

An additional factor that weakened the stewardship functions of the Brazilian government and Ministry of Health, and constrained the continued implementation and institutionalization of polio campaigns in Brazil during the early 1960s, was political and administrative instability. The period from early 1961, when Jânio Quadros assumed the presidency to the end of March of 1964 when the Brazilian military took power, was marked by extreme political and administrative instability. This instability was highlighted in a Brazilian Ministry of Health report from 1963 on the recent polio immunization campaigns that pointed out, “In spite of the abnormal situation in Brazil at that time – resulting from the resignation of the president – it

98 Ibid., 11.
99 Ibid.
100 Ibid., 12.
proved possible to cover 80% of the planned total to be vaccinated.” After only six months in office President Quadros resigned suddenly on August 25, 1961. The 1963 report continued stating:

It should further be remembered that this was the first Brazilian experiment in mass vaccination. It made use of local population resources and was carried out in only six days. This demonstrates the care and efficiency with which the work was planned and executed, in spite of a serious crisis in national life.101

The domestic political situation in Brazil continued to deteriorate over the next several years. On March 24, 1964, Dr. Oswaldo Campos described the escalating “crisis in national life” in a letter to Albert Sabin writing:

I don’t have to tell you about the situation in our country which can’t get any worse short of a catastrophe, as probably you have read in the newspapers. When we go to bed at night we just don’t know what it will be like the next morning…the only thing quiet in Brazil at the present time is the polio situation.102

One week later, on March 31, 1964, the democratic administration of President João Goulart was toppled by a coup orchestrated by the Brazilian military. The “crisis in national life” and political and administrative instability of the Quadros-Goulart period in the early 1960s resulted in an extremely high and unpredictable turnover of Brazilian public health officials. From January 1961 to the date of the military coup in 1964, Brazil had no fewer than eight different Ministers of Health, two of whom held the position for less than two months. This had direct implications for the stewardship functions of the Ministry of Health, especially concerning the establishment of overarching programmatic guidelines, facilitating long-term planning, and providing leadership within the health sector. In a telegram to a reporter at the Jornal do Brasil, Dr. Sabin remarked, “I have been in constant correspondence with Brazilian health authorities since 1961

102 Letter from Oswaldo Campos to Sabin, March 24, 1964. Sub: Correspondence, 1954-1986, B1, F7 (Brazil)
on the polio problem. One of the complications there is that Ministers of Health come and go and it is difficult to maintain continuity in any program.”

Between 1956 when the Salk vaccine was first adopted in Brazil, to March 31, 1964, when the Brazilian military took power, Brazil had 11 different Ministers of Health. The instability and high frequency of leadership turnovers are even more dramatic when focusing only on the implementation episode involving mass immunization campaigns with the live polio vaccine between April of 1961, when the Ministry of Health adopted the live vaccine, and the date of the coup. During this three-year implementation episode there were seven different Ministers of Health, none of whom remained in their position for a full year.\(^{103}\)

Edward Cattete Pinheiro, the Minister of Health who established the Special Commission to advise the Ministry on the live polio vaccine adoption decision in March of 1961, left office the week the before the first pilot programs with the live vaccine were launched in Petrópolis at the end of August of 1961 after having served as Minister of Health for just six months. Brazilian President Jânio Quadros resigned the same week. The next Minister of Health, under the new administration of João Goulart, was Estácio Gonçalves Souto Maior who assumed his position shortly after the launch of pilot mass immunization campaigns. Souto Maior remained in his position for ten months before being replaced in June of 1962 by Manoel Cordeiro Villaça who served as Minister for just over two months before being replaced again.

The repercussions of this instability can be seen in the letters exchanged between key actors involved in the campaigns and between Brazilian public health officials and scientists, and Dr. Albert Sabin. In some of the letters, public health officials at the state level were writing to Dr. Sabin to receive clarification concerning technical guidelines for the programs based on the

lack of continuity in programmatic guidelines provided by the Ministry of Health during this period.

Political and administrative instability were not unique to Brazil, but were relatively common implementation constraints and impediments to stewardship development within health sector throughout the region during the 1960s and 1970s. Instability negatively influenced health policy planning processes, the establishment of regulatory or evaluation mechanisms, policy implementation efforts, institutional capacity development, and research and training efforts underway in the region. A 1966 PAHO report on science policy and medical research in Latin America explained:

A certain degree of political and administrative instability characterizes all nations and is not unique to Latin America. The characteristic of such changes that often produces distinctive effects on science in Latin America is their tendency to affect all levels of government. A change of government or even a change of ministers can result in changing the leadership of scientific institutions. This discontinuity has had bad effects both on current work and on the long-range plans of some institutions. Many research workers have had to emigrate as a result of political shifts.\textsuperscript{104}

The PAHO report highlighted the consequences of instability on both institutional capacity development as well as the establishment and maintenance of strong domestic communities of experts. Nowhere were the deleterious effects of instability on polio and related immunology work more visible than in Brazil shortly after the military coup on March 31, 1964. The coup caused major disruptions in a broad range of health and medical research institutions including but not limited to the Oswaldo Cruz Institute (IOC). By 1965 several prominent former leaders within the IOC, including its director, polio expert Dr. Joaquim Travassos da Rosa, had been dismissed by the new military regime.

Shortly after the coup, Raymundo de Britto, the newly appointed Minister of Health, launched a crackdown on scientists at the IOC viewed as being “subversive” and/or having ties to the Brazilian Communist Party. Francisco Rocha Lagoa was appointed to replace director Joaquim Travassos da Rosa, a key figure in previous polio research and a member of the Special Commission charged with the live polio vaccine adoption decision and helping to plan the first mass immunization campaigns in 1961. Travassos’ son, who also went on to become a prominent scientist in Brazil described Rocha Lagoa as “a poor scientist, a poor administrator, but a good anticommunist.”\textsuperscript{105} Shortly after his arrival, the new director prepared a list of “subversive” scientists that he claimed were “conspiring in their laboratories” resulting in the dismissal of many of the IOC’s leading researchers and caused a major disruption of its programs.\textsuperscript{106}

One of the programs disrupted by the 1964 purge was the laboratory support provided to mass polio immunization campaigns underway in Brazil at the time of the coup. The disruption had immediate consequences for the campaigns due to the fact that laboratory confirmation of suspected cases of polio could no longer be conducted and laboratory work was unreliable and inconsistent at best regarding vaccine quality assurance and testing. Polio outbreaks appeared in major cities throughout 1964 and 1965 in spite of previous vaccination efforts. PAHO’s \textit{Annual Report} for 1964 noted that outbreaks in the states of Guanabara and Rio de Janeiro indicated the poor quality of the vaccines used in recent mass immunization campaigns based on the low seroconversion rates among already vaccinated children and the high incidence of other

\textsuperscript{105} Interview with Luiz Travassos (his son) online published in June 2012.
enteroviruses.\textsuperscript{107} However, without a functioning enterovirus laboratory at the IOC it was impossible to conduct the investigations required to identify the true source of the problem or develop a solution. Ultimately, the disruption at the IOC had exacerbated the already weak regulatory capabilities of the Ministry of Health, one of the key components of stewardship, and as a result, vaccines of insufficient quality were being used in vaccination programs.

While not a permanent solution, and clearly only addressing small pieces of the much larger problem related to domestic political and administrative stability, PAHO and other key external actors such as the Rockefeller and Ford Foundations helped to mitigate the deleterious effects of instability in a number of ways. One of the ways in which these key external actors helped minimize the disruptions caused by increasingly high turn-overs within Brazilian institutions, was by providing long-term consultants to work in key institutions such as the IOC as well as providing additional support to existing staff to bolster their research efforts and make them less vulnerable to internal political changes.

For example, when funding was cut at a given institution or university department, the Ford Foundation might provide a grant to cover the salaries of research staff or for visiting professors.\textsuperscript{108} In some cases external actors went even further, as in the case of the forced retirement of more than two-dozen prominent university professors in the late 1960s. The Ford Foundation’s office in Brazil moved quickly to provide funding for the dismissed academics who established the Center for Analysis and Planning that became a prominent research institution in Brazil.\textsuperscript{109}

\textsuperscript{107} "Annual Report of the Director, 1964," 49.  
\textsuperscript{108} I collected information on the role and involvement of the Rockefeller Foundation in Brazil by looking through annual reports of the Rockefeller Foundation that included information on all of the grants and fellowships provided by the Foundation in any given year.  
\textsuperscript{109} Peter Bell interview. "For the United States, Brazil was a Cold War battleground." September 16, 2012. Accessed from Inter-American Dialogue at http://www.thedialogue.org/page.cfm?pageID=32&pubID=3084
Alternately, during a period of particularly high turnover in an institution, PAHO would offer the services of a full-time long-term consultant to staff the institution and train additional domestic personnel during the transition period. In this way, PAHO helped to provide support to make up for the weaknesses within Brazilian institutions. Such was the case after work at the enterovirus laboratory at the IOC was disrupted in 1964 after a range of key figures at the Institute had been dismissed including its former director Joaquim Travassos da Rosa who was a key figure in supporting the polio immunization campaigns. In response to the 1964 disruptions, PAHO sent full-time consultant, Yugoslavian virologist Dr. Milan Milovanovic to Brazil to resume the operations of the enterovirus laboratory at the IOC. One of Milovanovic’s additional responsibilities was to train local laboratory technicians to staff the enterovirus lab, in part to make up for the loss of staff that had resulted from the recent purge.

Geoepidemiological Effects: International Relations, External Pressures, and Policy Priorities

In addition to political and administrative instability, polio immunization initiatives in Brazil in the early 1960s were similarly derailed by competing health priorities and interrelated changes in both national and international health agendas. Michael Weis describes Brazilian foreign relations in the 1940s and 1950s as a combination of a “special relationship” with the United States on the one hand, and a “sense of separateness from Spanish America” on the other.

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110 Milovanovic trained under Nobel Prize winning virologist Dr. John Enders at Harvard University’s Boston Children’s Hospital Laboratory and, along with Enders and fellow researcher Dr. Samuel Katz, developed the live attenuated measles vaccine licensed for use in 1963.

111 Advisory Committee on Medical Research (ACMR), "Immunology in Latin America: A Survey," (Washington, DC: Pan American Health Organization, 1965), 8-9.; The IOC was not immune to further disruptions caused by the military regime however. In 1970 the so-called “Manguinhos Massacre” resulted in the dismissal of ten of the IOC’s leading scientists and further disruption in the Institute’s research and training programs, just prior to the launch of the Brazilian National Polio Control Program (NPCP) in 1971.

Other authors have characterized Brazil’s relationship with the United States as one of “alignment” starting in 1942 when Brazil joined the Allied forces during World War II strengthening ties with the United States in a variety of ways as a result.\textsuperscript{113}

Gilberto Hochman writes that while Brazil was “already fully within the United States’ sphere of influence” in 1956 when the administration of Juscelino Kubitschek came to power. Domestic economic troubles and national development ambitions articulated by President Kubitschek provided additional incentives for greater alignment with the United States and U.S.-supported health initiatives.\textsuperscript{114} Hochman writes that during the Kubitschek administration (1956-1961) Brazilian authorities had to perform a balancing act between domestic health priorities and “an international health agenda led by Brazil’s most important commercial partner, funder, and leader of the Western Capitalist bloc.”\textsuperscript{115}

During the late 1950s and early 1960s polio and smallpox were competitors for political priority within the domestic public health community in Brazil. Similar campaigns were launched for both diseases under the Goulart administration (1961-1964). Gilberto Hochman writes that in the early 1960s there was no consensus within domestic policy communities in Brazil about the importance of smallpox as opposed to other vaccine preventable diseases such as polio. However, a combination of geoepidemiological factors and external actor influence contributed to the rise of smallpox on the Brazilian policy agenda and the virtual disappearance of polio.\textsuperscript{116} By 1967 when the WHO launched the intensified global Smallpox Eradication

\textsuperscript{113} Monica Hirst and A. Hurrell, \textit{The United States and Brazil: A Long Road of Unmet Expectations} (Psychology Press, 2005), xviii. Note that Mexico did not join the Allies and did not allow the United States to use Mexican territory for military bases the way Brazil did.

\textsuperscript{114} Hochman, “Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda,” 241.

\textsuperscript{115} “From Autonomy to Partial Alignment: National Malaria Programs in the Time of Global Eradication, Brazil, 1941-1961,” 183.

\textsuperscript{116} “Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda,” 244.
Program (SEP), Brazil was the only country in Latin America where smallpox had not been eliminated through domestic vaccination programs.

As a result Brazil’s failure to control smallpox within its own borders, Brazil was endangering the progress that its 10 border-sharing neighbors and other countries in the region had made in their own domestic smallpox campaigns and thus becoming a problem for PAHO. In 1967 PAHO Director Abraham Horwitz opened his Annual Report for the year with a cautionary statement about smallpox and the responsibility of domestic governments in the region. Horwitz reminded PAHO Member Nations, “There is no place for the indifference of those who have not fulfilled their commitment and are jeopardizing the position of those who have fulfilled theirs, at the cost of great sacrifice.” While not singling out Brazil by name, Brazil was the only country in Latin America that hadn’t had a national smallpox immunization program throughout the 1950s and early 1960s, in spite of PAHO resolutions concerning smallpox eradication as early as 1949.

In addition to facing pressure from other Latin American countries, Brazil was increasingly feeling pressure from the United States. Once the United States became a leader in the global smallpox campaign and became an active funder of the campaign, Brazilian authorities saw an opportunity. According to Hochman, based on the high profile of the global smallpox campaign and U.S. involvement, smallpox emerged as a way for the Brazilian military regime to gain international legitimacy by aligning itself with the United States and the international community. Alignment also had significant material incentives and paved the way for financial and technical assistance from the United States and other international organizations and donors. There was no such international support or incentives for combating polio.

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118 “Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda.”
On May 24, 1965, Dr. Oswaldo P. Campos wrote to Albert Sabin stating, “I can tell you right now, the situation all over Brazil is about the same, polio is still a problem, because the oral vaccine has not, as yet, been properly and widely used.”\textsuperscript{119} The following year, on August 22, 1966, one week prior to the launch of Brazil’s national Smallpox Eradication Campaign (CEV), Dr. Sabin wrote to Dr. Paulo de Góes, Director of the Institute of Microbiology at the University of Brazil in Rio de Janeiro who was then serving as the Scientific Attaché at the Brazilian Embassy in Washington. Dr. Sabin wrote:

You will note that I was shocked to learn of the extraordinarily large number of cases of poliomyelitis, presumably in Rio de Janeiro, during the period of 1964-1965. If all of this is correct, there is obviously a failure, for whatever reasons, in maintaining proper immunization of the children. Considering the extraordinarily successful mass vaccination campaign that was carried out in 1961-1962, it is regrettable that the same effective forces could not be engaged in continuing vaccination that is required.\textsuperscript{120}

Creating Capacity for Implementation in Brazil

In spite of the significant constraints that ultimately derailed Brazilian polio immunization efforts in the early 1960s, there were a number of positive spillovers produced in part by the campaigns and collaboration between Brazilian officials and external actors that helped to improve Brazil’s domestic capacity for future immunization initiatives. Two of the key capacity building initiatives during the 1960s were focused on strengthening domestic laboratory capacity as well as immunology research and training capacity. These interrelated initiatives are examined in the following sections to illustrate how these efforts helped to change the domestic context in Brazil that, in turn, facilitated more effective implementation during later policy implementation episodes.

\textsuperscript{119} Letter from Oswaldo Campos to Albert Sabin, May 24, 1965. ABS Archives, Sub: Correspondence, 1954-1986, B1, F7 (Brazil)

\textsuperscript{120} Letter from Albert Sabin to Paulo de Góes, August 22, 1966. ABS Archives, Sub: Correspondence, 1954-1986, B1, F7 (Brazil)
Some of the most enduring collaborative efforts in immunology and laboratory capacity building between PAHO and Brazilian institutions date back to the lead-up to and launch of mass polio immunization campaigns with the live poliovirus vaccines in 1961. Collaboration on polio and other enteroviruses between the Oswaldo Cruz Institute and PAHO began in 1959 when the two parties signed an agreement whereby PAHO would assist the IOC in establishing laboratory facilities for virus diagnosis, research, and vaccine production. In addition to its research and training functions, the IOC also housed the Central Brazilian Government Laboratory that was to become Brazil’s National Virus Laboratory. The IOC, then under the direction of Dr. Joaquim Travassos da Rosa with Dr. Laura Queiroga as head of the Institute’s enterovirus lab, provided the laboratory support for the pilot study with additional technical cooperation provided by PAHO. Dr. Travassos was a member of the Special Commission that had recommended the adoption and use of the live polio virus vaccine in April of 1961.

As part of the technical cooperation agreement PAHO provided a virology consultant to help develop the IOC’s virus laboratory and train local technicians. The consultant sent to Brazil was Dr. Hanna Doany (discussed in chapter two). Doany had recently completed his work helping to develop the virus laboratory in Cali, Colombia, linked to the Colombian live vaccine field studies (1958-1959) where he had also conducted regular training courses for lab technicians from other countries in the Americas. In Brazil, Doany worked with Dr. Laura Queiroga and newly arrived Brazilian virologist Dr. Hermann Schatzmayr at the enterovirus lab at the IOC that provided diagnostic services for the entire country.

As discussed previously, the military coup at the end of March of 1964 caused serious disruptions at the Oswaldo Cruz Institute and other Brazilian research and training institutions. A PAHO report on biomedical policy in Latin America from 1965 noted that, “new governments
try to get rid of those who were supported by the old regime and often unjustly accuse them of taking extreme political attitudes.”

That same year internationally renowned immunologists Drs. Niels Jerne and Howard Goodman visited Brazil at PAHO’s request to survey immunology research and training facilities. In spite of the significant turmoil in Brazil during the mid-1960s PAHO staff and consultants as well as domestic communities of experts in Brazil were confident that, if adequately supported by PAHO and other key external actors and existing domestic capacity maintained and strengthened, Brazil had more than enough domestic expertise to justify the establishment of a regional research and training program in immunology.

The foundation for their optimism came in large part from the Institute of Microbiology and the University of Brazil in Rio de Janeiro, and the Escola Paulista Medical School at the University of São Paulo. Dr. Paulo de Góes, Director of the Institute of Microbiology, was a prominent virologist and a member of the Brazilian polio elite during the 1950s and 1960s. Under the leadership of Dr. de Góes, the Institute became Brazil’s primary training and education facility for microbiology during the 1950s and early 1960s. As of 1963 de Góes had already trained more than 300 Brazilian microbiologists and immunologists. Additionally, the Institute maintained a registry of former students and other active Brazilian microbiologists that included an up-to-date profile of their current interests and research activities. After visiting the Institute in March of 1965 Drs. Jerne and Goodman commented that during the past 15 years Dr. de Góes “has carried out an extremely useful and important, role in developing not only a large number of trained people for the Brazilian health services, but also in building up a tradition by following up teaching with continuing contact with the trainees (as well as other microbiologists)

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ultimately, the Institute of Microbiology played a vital role in developing a strong domestic community of experts in Brazil throughout the 1950s and 1960s, some of whom went on to have leadership positions in public health at state and national levels.

In addition to the Institute of Microbiology in Rio de Janeiro, a WHO/PAHO-sponsored regional training center focused on immunology research and training was established at the Escola Paulista Medical School in São Paulo, under the direction of Dr. Otto G. Bier. Sant’Anna, a former student of Dr. Bier writes that the establishment of the Regional Immunology Research and Training Center in São Paulo was a landmark in Brazil’s immunology history and helped to create a “vanguard of Brazilian immunologists.”

In 1966 when the regional center was established, Dr. Bier was the President of the Brazilian Microbiology Society, a member of Brazil’s National Research Council, a member of both the WHO and PAHO’s scientific advisory committees, and also on the WHO’s Expert Panel on Immunology.

Bier was also something of a scientific statesman, known and respected both domestically and internationally for his advocacy on behalf of increasing support for scientific research in developing countries. For example, in 1948 Bier and group of scientific colleagues in São Paulo founded the Brazilian Society for the Advancement of Science. Botelho and Schwartzman claim that the Society helped to organize Brazilian scientists into a sort of pressure group against the military regime starting in 1964, provided a basis for advocacy to support science and research, and also strengthened links between Brazilian scientists and international scientific communities.

125 A. J. J. Botelho and Simon Schwartzman, "Growing Pains: Brazilian Scientists and Their Shifting Roles." Note that the Society also provided the foundation for the Brazilian Health Studies Center (CEBES) established in 1976 that was one of the key actors in Brazil’s subsequent health reform process.
Bier served as the director of the regional immunology research and training center until 1971 when he confessed he had grown tired of the political disruptions and bureaucratic obstacles placed on the center by the military regime.\textsuperscript{126} However, after stepping down as director Dr. Bier remained extremely active not only in the Center’s research and training activities but also as a scientific statesman and advocate in Brazil and abroad. In 1972 he and a small group of leading immunologists created the Brazilian Immunology Society (SBI). Sant’Anna claims that SBI was established to “prevent eventual repression” by the Brazilian military at the “summit of the tyranny” imposed by the regime.\textsuperscript{127} Coutinho writes that both societies (the SBI and Brazilian Society for the Advancement of Science) served as a “stronghold of opponents to the autocratic regime and a rare forum for free exchange of ideas in the country.”\textsuperscript{128} Rabinovich et al. claim that the “entire Brazilian immunology community is beholden to the founders” of the SBI.\textsuperscript{129}

Support from international scientific communities emerged as another significant source of external actor influence in Brazil that similarly helped to mitigate the negative effects of domestic political instability throughout the 1960s and 1970s. It is noteworthy that during this period of time, two similar immunology societies were established in Chile and Argentina by prominent immunologists who were all linked to one another and linked to the Pan American Health Organization through overlapping professional and personal networks. Both the Chilean and Argentine societies similarly provided a crucial source of support for domestic scientific


\textsuperscript{127} Sant’Anna, “Immunology in Brazil: Historical Fragments,” 111.


communities in spite of repressive military dictatorships and helped to soften the damage done by significant political turmoil in South America during this period of time.

Brazil Case Study Summary

Brazilian polio immunization efforts in the early 1960s were constrained by number of factors that were not unique to polio campaigns but common across public health issues in Brazil during this period of time. The stewardship role of the Federal Government was almost non-existent during the early 1960s thanks to a combination of historical precedents concerning the autonomy of states relative to the national government, and the significant political and administrative instability in Brazil during this period prior to the military coup at the end of March of 1964. The political and administrative instability within the Ministry of Health during this period made it difficult to establish any continuity within public health programs or develop clear and consistent guidelines for programs that could then be used by state-level officials to guide their own programs.

Without clear stewardship functions provided by the Ministry of Health, including technical cooperation or guidance, state and local official were largely on their own to develop and execute immunization programs as they saw fit and as their own resources would permit. The extreme subnational variation in institutional capacity and resources meant that immunization programs were carried out in some states and localities but not others. Poorer states lacking resources or basic infrastructure to implement immunization campaigns were largely dependent on assistance from the Federal Government, and when the Federal
Government’s priorities changed, as was the case in the mid-1960s, poorer states could not sustain immunization initiative using their own resources.

In 1961 the plan developed by the Brazilian Ministry of Health did recognize the need for subnational program adaptation. According to the plan, the Ministry of Health would provide overarching technical guidelines for the basic plan to be followed, “which was to be adjusted to local conditions.” However, based on significant subnational variation in institutional capacity, some states had better adaptive capacity than others, and were thus able to more effectively adapt the program to suit local conditions.

Brazilian polio campaigns were also constrained by other issues related to the capacity of the health system during this period, specifically related disease surveillance. In the late 1950s and early 1960s when Brazilian public health officials adopted polio vaccines for use in immunization programs, polio was not a notifiable disease. This meant that polio didn’t have to be reported by public health officials or doctors in any consistent way, which severely limited the amount of information available to public health officials to plan and adapt immunization programs. Additionally, Brazil’s domestic surveillance capacity was virtually non-existent during the early 1960s, which meant that there was virtually no way to assess the impact of immunization campaigns other than by the presence or absence of epidemics.

External actors played an important role in Brazil during the early 1960s, not only helping to launch the initial pilot polio immunization campaigns in 1961, but also providing stability in domestic laboratories during the chaos surrounding the military coup in 1964. However, the involvement of external actors such as PAHO wasn’t sufficient to in any way sustain campaigns in the absence of greater domestic political priority for polio. PAHO was clear that its role was to support domestic actors and institutions, and not to act as a direct service

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provider or steward of a country’s health sector. Moreover, external actors and influence also helped to derail polio campaigns in the mid-1960s. Once international priority shifted decisively in favor of smallpox there were new pressures and incentives favoring smallpox over polio (or any other disease). Pressure from PAHO and Brazil’s neighbors, negative international attention on Brazil within the global smallpox campaign, and significant financial and material support from the United States, the Canadian International Development Agency, the WHO, and PAHO, all contributed to polio’s disappearance from the Brazilian health agenda.

Mexico Implementation Case Study: 1957-1964

Polio was made a notifiable disease and included in disease surveillance reports in Mexico in 1937, a full thirty years before polio became a notifiable disease in Brazil in 1968. Starting in the late 1940s increasing anxiety and fear associated with polio within the Mexican population, especially in urban areas where polio incidence was highest, provided the impetus for public policy interventions aimed at combating polio. Mexican public health officials adopted the Salk vaccine immediately after it became available in 1955. Vaccination was gradually scaled up over the course of the next several years with both the inactive and live vaccines used in national programs. As a result, in 1960, Mexico joined the United States and Canada, as one of the only countries in the Western Hemisphere to have immunized over 1.5 million people during the

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year.\textsuperscript{132} By 1964, it was estimated that Mexico had immunized roughly 75\% of the total population of children under the age of six.\textsuperscript{133}

Ultimately, between 1955 when the first polio vaccine was introduced to the public and adopted for use in Mexico, and 1965, Mexico’s polio immunization campaigns were among the most effective in the region of the Americas. During this period of time Mexico was consistently included within PAHO reports alongside countries such as the United States, Canada, and Cuba, as one of the countries where considerable progress in combating polio through effective immunization programs had been achieved.

There are several key factors that help explain the development and implementation of polio immunization initiatives in Mexico as well as their relative success during this period. First, Mexican polio immunization policies were influenced by a series of geoepidemiological factors especially related to Mexico’s relations with, and proximity to, the United States. Mexico was at far greater risk of polio importations from the United States than any other country in the Americas and vice-versa, and Mexico also had greater communication and opportunities for cross-national exchanges with public health officials and researchers in the United States. Additionally, in the 1950s, Mexico had easier and more immediate access to polio-related information and innovations from the United States, than the rest of its Latin American colleagues.

Second, key elements of Mexican public health precedent included the strong role played by the federal government relative to subnational actors on all things related to the control and prevention of diseases, a long history of state intervention in health, and a traditional priority for

\textsuperscript{132} As of 1960 there were 10 countries in the Americas with populations larger than 5\textsuperscript{th} million people based on data from (PAHO), "Summary of Four-Year Reports on Health Conditions in the Americas, 1957-1960," 2.
prevention. Additional factors related to public health precedent included the existence of vaccination legislation, a long history of domestic institutions such as the Catholic Church supporting vaccination, and a culture of community participation in health. Mexico’s history of community mobilization in public health, although not as institutionalized as Cuba’s mass organizations, helped to facilitate domestic immunization initiatives in Mexico throughout the 1960s, 1970s, and 1980s. This will be seen especially in chapter six concerning the role that existing community organizations and Mexican Rotarians played in polio campaigns in the mid-1980s.

Third, the capacity of the Mexican health system was comparatively strong relative to other countries in the region, especially related to domestic vaccine production and regulation, laboratory research, and integration of research into policymaking. Additionally, the stewardship role of the Federal Government and Secretariat of Health in Mexico was comparatively strong and well established, with the Secretariat’s role and responsibility for the nation’s health outlined by a series of Sanitary Codes that included responsibility for disease surveillance and data collection, policy planning, execution, and enforcement throughout the entire country. The Sanitary Codes also provided the basic framework for national subnational collaboration on public health issues.

Additionally, the authority of Mexico’s central government relative to subnational units was extremely strong relative to other countries in the region. Although a nominally federal system, the central government exercised a significant amount of authority throughout the country with state-level political and government leaders largely belonging to Mexico’s ruling Institutional Revolutionary Party (PRI) that ruled the country without interruption for 70 years between 1930 and 2000. Mexico’s political stability under the PRI was unparalleled in Latin
America throughout the 1900s as was the administrative stability and continuity of leadership within the health sector. All of these factors are examined in the following case study and used to explain the development and implementation of polio initiatives in Mexico and their related outcomes between the late 1950s and first half of the 1960s.

**Proximity and Prophylaxis: Geoepidemiology and Policy Responses to Disease**

Mexico’s policy responses to polio were influenced by a series of geoepidemiological factors especially linked to Mexico’s relations and shared borders with the United States. Mexico’s proximity to the United States and 2,000 miles of shared border created an unexpected situation between the two countries where polio was concerned: Mexico was initially at far greater risk of imported cases from the United States than the other way around. As discussed in chapter two, prior to World War II, polio was not viewed as a disease of major importance in countries beyond the industrialized world. Even as it became clear that polio was a bigger problem in many tropical and subtropical countries than had previously been assumed, polio rates in the United States still far surpassed rates in the majority of Latin American countries.

In 1954, the year before the Salk vaccine became available, the United States reported 38,476 cases of polio. In contrast, that same year, Mexico reported 609 cases.\textsuperscript{134} In spite of the fact that Mexican case reporting was arguably much weaker than case reporting in the United States, and therefore the actual incidence in Mexico was likely significantly higher, even as Mexican reporting procedures and capabilities improved dramatically, case rates in Mexico never came anywhere close to those reported in the United States during the 1940s and 1950s.

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\textsuperscript{134} "Summary of Four-Year Reports on Health Conditions in the Americas," 54.
At the end of the 1940s there was a significant spike in polio cases reported in the Southwest United States, prompting Mexican public health officials to take aggressive and proactive measures to prevent possible disease importations. On August 21, 1949, U.S. newspapers reported that Mexican government officials had passed new restrictions requiring all travelers from the United States to present a medical certificate demonstrating that they had not been exposed to polio within the past three weeks. One article claimed that Dr. Chapa Garza, the federal health official in Nuevo Laredo, had “slapped on the ban at mid-morning, minutes after the health ministry in Mexico City telegraphed him the order.”\(^{135}\) Within hours of issuing the order, 50 to 60 tourist vehicles were turned back from the border with the number of would-be travelers denied entrance to Mexico growing throughout the course of the day.\(^{136}\) Two days later a local Arizona newspaper reported, “The flow of dollar-bearing tourists dwindled today as Mexico strengthened her guard against polio.”\(^{137}\)

This example illustrates several key points that are important for understanding Mexico’s policy response to polio. First, geoepidemiological factors such as Mexico’s proximity to a major source of polio (the United States) helped make polio a high priority policy issue in Mexico. Second, due to the stewardship role allocated to the Federal Government by the Mexican Constitution, federal government authorities had the power to issue (by executive order) a preventive public health directive in Mexican states with the expectation that this directive would be immediately enacted and enforced by state-level public health officials. This highlights the authority of Mexico’s central government relative to states. Third, in addition to state-level health officials who were constitutionally mandated to assist Mexican central government authorities in the prevention and control of communicable diseases, a federal health official was

\(^{136}\) Ibid.
also stationed in each state which helped to strengthen the enforcement capacity of the central government and ensure compliance with federal directives (additional aspects of stewardship).

The extensive stewardship functions and intervention powers that federal health authorities had in Mexico relative to state and local actors stood in contrast not only with Brazil but also with the United States. In the United States, the Federal Government did not have the authority to intervene or enact preventive public health interventions in individual states, which was a point of contention between the United States and Mexico. Mexican government officials regularly accused the United States of not upholding its end of international sanitary regulations and quarantine agreements, with the vast majority of authority and responsibility for enacting such measures, reserved for individual states rather than national government authorities. Similar tensions emerged in the aftermath of the Cutter incident discussed in chapter two.  

News articles and public health reports from both Mexico and the United States throughout the 1950s and early 1960s illustrate the constant back and forth that took place among public health officials on both sides of the border concerning polio and possible preventive interventions. Additionally, these exchanges suggest that proximity also affected Mexico’s access to polio-related information and innovations. Specifically, Mexico had easier access to the inactive Salk vaccine based in part on fears of importation within the United States. A series of newspaper articles in April of 1955, shortly after the Salk vaccine was introduced and licensed for use, are illustrative in this regard.

In an article titled, “Polio Wins Tragic Race from Mexico,” the Chicago Daily Tribune reported that a family visiting Acapulco had cut their trip short after learning that several cases of

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139 Mexican public health officials had already reached out to the National Foundation for Infantile Paralysis concerning the possibility of domestically producing the inactive Salk vaccine, before the results of the Salk vaccine field trials had even been announced in April of 1955.
polio had been reported at the resort where they’d been staying. The father contracted polio and
died shortly after returning to his home in Chicago resulting in an emergency vaccination drive
and the distribution of 8,000 doses of the newly licensed Salk vaccine to people in neighboring
areas. 140 Several days later another headline in the Tribune announced, “Polio is Fatal to Bride
After Acapulco Visit,” reporting that a young bride had been stricken with polio while on her
honeymoon in Mexico and had died shortly after her return to the United States. 141 Mexican
officials did not take kindly to the headlines in the United States and claims of a polio epidemic
ravaging visitors from the United States in Mexico. The Mexican government was quick to
respond to accusations made in the Chicago press. Not only was there no polio epidemic in
Mexico, the officials stated, but moreover, Mexican public health officials were wholly
unconvinced that the disease hadn’t in fact been brought to Mexico by the visitors themselves. 142

With 2,000 miles of shared border between the two countries any communicable disease
threat in Mexico was immediately of concern in the United States, and vice-a-versa. As a result
of these shared threats there were greater incentives for collaboration in both countries. There
were also greater incentives to share information and access to newly available preventive
interventions. For example, in the early 1950s when researchers first developed the idea of using
gamma globulin as an intervention to prevent paralysis in polio patients and as a possible anti-
epidemic measure, key researchers in the United States and Mexico shared their findings with
one another and a meeting of the United States-Mexico Border Public Health Association in
1953. 143 Then in 1954, as the Salk vaccine was being tested in the United States, Mexican public

141 “Polio is Fatal to Bride After Acapulco Visit,” Chicago Daily Tribune, April 21, 1955, pg. 3
142 “Deny Acapulco Polio Victims Infected Here,” Chicago Daily Tribune, April 23, 1955, pg. 4
143 Carlos Calderon et al., “Results of Gamma Globulin as a Preventive Agent of Polio in Mexico,” Boletín de
Sanidad Militar 7, no. 5 (1954).
health officials met with officials at the National Foundation for Infantile Paralysis to discuss prospects for domestic vaccine production in Mexico.\textsuperscript{144}

After the Salk vaccine was licensed for production in the United States in April of 1955, Mexican public health officials also gained more easy access to the Salk vaccine relative to other countries in Latin America. Although the United States Commerce Department placed export controls on the Salk vaccine only days after the vaccine was licensed on April 12, 1955, Mexican public health officials were allowed to keep a shipment received from a U.S. pharmaceutical company immediately prior to the export controls taking effect.\textsuperscript{145} No other country in Latin America had this sort of early and preferential access to the Salk polio vaccine. As a result, prior to the developed of the live oral polio vaccine, Mexico reported more widespread vaccination with the Salk vaccine than any other country in Latin America, with free vaccination conducted in government clinics starting in 1956.

In addition to early access to the Salk vaccine, Mexico was also the first country in Latin America to begin live oral polio vaccine field studies in 1957 (discussed in chapter two). In spite of Mexico’s comparative advantages related to the Salk vaccine, same basic factors that made the live oral polio vaccine a more feasible alternative for the rest of Latin America and the developing world were similarly relevant in Mexico. Mexico used both the Salk and Sabin vaccines throughout the late 1950s, switching firmly over to the live vaccine during the early 1960s.

\textsuperscript{144} “Mexico Asks U.S. for Salk Vaccine,” \textit{Milwaukee Sentinel}, April 13, 1955
\textsuperscript{145} “Mexico Beats Deadline on Vaccine Imports,” \textit{Toledo Blade}, April 17, 1955
Public Health Precedent: the Federal Government as Steward of the Nation’s Health

In addition to having easier access to polio vaccines in the second half of the 1950s, Mexico’s public health precedent similarly influenced the development and implementation of polio immunization initiatives in Mexico. The following section explains the ways in which Mexico’s domestic public health precedent influenced polio immunization initiatives during the late 1950s and 1960s. One of the most significant factors that helps explain the comparative effectiveness of the Mexican immunization campaigns in the second half of the 1950s and first half of the 1960s, was the power and responsibility of the central government relative to subnational units on issues related to the prevention and control of diseases.

The Mexican Constitution of 1917 was the world’s first constitution to include special mention of social rights that established the subsequent foundation for the Federal Government’s stewardship role, including its authority and responsibility for public health initiatives. More specifically, the Constitution designated the Federal Department of Health (the Secretariat of Health and Welfare starting in 1943) as “the supreme authority in matters of hygiene” with the Sanitary Code (1926 and 1934) as its basis for action. This statement is significant in that it institutionalized the basic notion of the Federal Government as the steward of the population’s health from the beginning of the post-revolutionary period in Mexico. This enshrined the norm of “government as steward” as a basic pillar of Mexican public health culture linked to state-building efforts of Mexico’s revolutionary heroes.

Dr. Miguel Bustamante explained in 1940, “The states have their own rights and duties regarding what affects their own health, but the common problems are under Federal jurisdiction.” In the mid-1900s the primary public health responsibilities reserved largely for

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146 Miguel E. Bustamante, "Public Health and Medical Care," *Annals of the American Academy of Political and Social Science* 208(1940): 156.
state and local authorities included the inspection of food and beverages and basic sanitary engineering projects. The federal government was responsible for most everything else including, the prevention and control of communicable diseases, maternal and child health, health education, housing, water supplies and basic sanitation, the regulation of importation and transportation of food and medical products.¹⁴⁷

The Code also outlined what issues were the responsibilities of federal, joint local and federal, and purely local authorities.¹⁴⁸ Additionally, the Code stated that state and municipal authorities were required to assist federal authorities in the control and prevention of communicable diseases.¹⁴⁹ If state and local units were unable to fulfill their obligations the Code authorized federal authorities to “temporarily” take over public health services in states and municipalities when, “due to special circumstances,” the existing authorities and institutions were unable to provide adequate services.¹⁵⁰

The specification that states and municipalities are required to help the Federal Government in matters of disease control and prevention clearly established the authority of the Secretariat of Health and laid out clear expectations regarding the supporting role played by subnational units.¹⁵¹ This stands in stark contrast to the balance of powers and responsibilities in Brazil whereby the Federal Government only assumed responsibility for a very limited number of public health issues and only those deemed to be of national importance. The strong role for the central government relative to the states on issues of prevention and basic public health continued to be a theme within Mexico throughout the second half of the 1900s and influenced

¹⁴⁷ Ibid.
¹⁴⁸ Ibid.
¹⁴⁹ Ibid.
¹⁵¹ Bustamante, "Public Health and Medical Care,” 156.
the development of more contemporary health reforms starting in the 1980s and 1990s as will be seen in chapter six.

The Sanitary Code not only reinforced the authority of the central government, it also provided the guidelines and outlined a series of mechanisms for national-subnational collaboration, again in stark contrast to the situation in Brazil. The 1926 Code called for a representative of the federal ministry of health to be placed in each state and for the state health officer to be appointed based on agreements between federal and state authorities.\footnote{Tucker, \textit{Mexican Government Today}, 338.} In 1926 and 1927 federal health offices were established in each Mexican state.\footnote{Ibid., 337.} The Code also outlined the basis for agreements and collaborative projects between national and subnational health authorities with the objective of facilitating coordination among different levels of government. Another Sanitary Code was passed in 1934.

Two years later the Bureau of Cooperative Rural Medical Services was created in 1936 with the objective of improving rural healthcare access and services through collaborative projects initiated, executed, and financed by a combination of federal and local actors and resources. The basic model established a basic primary care facility staffed by a small team of health workers, in rural areas using the \textit{ejido} (an area of communal land farmed by members of a village - define better) as the basic unit of organization. The early priority for expanding access to care in rural areas and rural health system development efforts provided a foundation for later health system developments discussed in chapter six. The focus of the program was primarily on preventive care and the control of infectious diseases rather than on more costly curative services. The Bureau (through the federal government) initially covered the costs of the program
and corresponding health units, however local communities were expected to assume increasingly greater shares of the costs as the program evolved.\textsuperscript{154}

In addition to the Bureau of Cooperative Rural Medical Services, the Bureau of Coordinated Services of Health and Welfare was another cooperative program intended to coordinate the actions of federal, state, and local governments to provide greater access to health services. The program initially began in 1933 in three states but gradually expanded so that by the early 1940s the majority of states were integrated into the coordinated program.\textsuperscript{155} The program was established in each state through a cooperative agreement signed by state and federal authorities outlining a division of powers and responsibilities assumed by the different parties involved. According to Tucker, as of 1957 the federal government typically provided anywhere from two thirds to three fourths of the financing for the state-level programs.\textsuperscript{156} The result, according to Tucker, “is a much more adequate service than any state alone could provide, for the poverty of some states would condemn them to the most inadequate health protection.”\textsuperscript{157}

By 1960 the “health and social welfare” spending in Mexico accounted for 12.2\% of the total federal government budget. Additionally, the Federal Government contributed 52 times more than the total amount contributed by the States in 1960.\textsuperscript{158}

**Domestic Communities of Experts and Continuity within the Secretariat of Health**

Another important factor that helps explain Mexico’s immunization program development during this period of time has to do with health sector leadership, domestic communities of

\textsuperscript{154} Ibid., 343.
\textsuperscript{155} Ibid., 347.
\textsuperscript{156} Ibid.
\textsuperscript{157} Ibid.
\textsuperscript{158} Total federal government contribution for the year 1960 was $99,915,000 whereas the total contribution from the states for 1960 was $1,912,000. (PAHO), “Summary of Four-Year Reports on Health Conditions in the Americas, 1957-1960,” 63-64.
experts, and concurrent institutional changes taking place within the Secretariat of Health (SSA) and related organizations. One author describes Mexico’s health sector elites and bureaucracies during this period writing, “Heirs of the Porfirio científicos, although with a profoundly new face, and forerunners of the técnicos of the 1970s, though with a socialist-populist ideology, well-educated doctors (thanks to Rockefeller fellowships) peopled the higher ranks of central public health bureaucracy.”\(^{159}\)

In 1958 a new leadership team within the Secretariat including Minister Dr. José Alvarez Amézquita and Vice-Minister Dr. Miguel E. Bustamante, was appointed and began making a series of significant changes related to the structure and functioning of the Secretariat that strengthened the SSA’s leadership capacity related to inter-agency coordination and standard-setting. In 1958 the SSA created the Department of Public Health Services with jurisdiction over all agencies of the Secretariat engaged in health work. A key aspect of this change was that the technical activities that had previously been delegated to other agencies such as the Bureau of Coordinated Health and Welfare Services, the Bureau of Rural Social Welfare, the Bureau of Rural Cooperative Medical Services, and the Bureau of Health in the Federal District - were all transferred to the new Department of Public Health services.\(^{160}\) This increased the coordinating capacity of the central government and also increased the authority of the central health institutions relative to subnational units and also other units within the Secretariat. As a result, in early 1959 when Mexican researchers and public health officials began larger-scale field trials

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with the live oral polio vaccine (discussed in chapter two), the Minister of Health required the participation of all health agencies under the Secretariat’s newly expanded jurisdiction.\textsuperscript{161}

In addition to having a strong Secretariat of Health populated by a strong cadre of Mexican health elites, the continuity and stability of leadership within the Secretariat also contributed positively to Mexican polio efforts as well as broader health system capacity developments. The Mexican Secretariat of Health was a remarkably stable place during the period of time covered in this chapter and historically. Dr. Julio Frenk, Mexico’s Minister of Health from 2000-2006, explained that the stability within the Secretariat of Health was not only unique in Latin America, but also noteworthy within Mexico. Although Mexican political institutions have been characterized by an atypical level of stability and continuity relative to government institutions any other country in Latin America, the Secretariat of Health has been among the most stable of all Mexican government institutions throughout its history dating back to its establishment in 1943.\textsuperscript{162} Moreover, high-level actors within the Secretariat were often connected to one another through overlapping personal and professional networks and rose in a more or less predictable way through the ranks within the Secretariat and other elite political institutions. In explaining the sources of Mexico’s political stability during the 20\textsuperscript{th} century more broadly, Roderic Ai Camp writes that, “Each generation of politicians mentored a younger generation, contributing to an incremental quality in their personnel, while introducing new blood to each successive generation.”\textsuperscript{163}

Dr. Ignacio Morones Prieto, the Minister of Health when the Salk vaccine was first adopted for use in Mexico in 1955, served as Vice-Minister of Health under the previous

\textsuperscript{162} Author interview with Dr. Julio Frenk conducted on February 6, 2013.
Minister from 1946-1949, before he was tapped by the PRI (Mexico’s ruling party) to be the PRI’s gubernatorial candidate in the State of Nuevo León on the U.S.-Mexico border. While serving as Governor of Nuevo León, he inaugurated campaigns to combat malaria as well as a range of vaccine preventable diseases. He stepped down as governor and assumed his position as Minister of Health in December of 1952. Morones Prieto oversaw numerous health initiatives while serving as minister including the introduction and early domestic production of the Salk vaccine and Mexico’s first polio immunization initiatives in 1955. As an indicator of the powerful political stature he had as Minister of Health, in 1957 Morones Prieto was viewed as a possible PRI presidential candidate. Although he did not receive the PRI’s nomination he went on to serve as Director General of the Mexican Social Security Institute (IMSS) from 1966-1970.

In 1958 Adolfo López Mateos became president and appointed his former elementary school classmate, José Alvarez Amézquita to head the Secretariat of Health and Welfare. Alvarez Amézquita had served in high-level positions in both the Secretariat of Health and the Secretariat of Labor previously. Seasoned Mexican federal health servant, Rockefeller Foundation fellow, and former PAHO executive director, Miguel Bustamante joined the Secretariat as Vice-Minister of Health Services in 1959. The two men would both remain at the Secretariat in their leadership positions until 1964 at which point Miguel Bustamante went on to serve as Director General of Mexico’s National Health Council (1965), the highest health policymaking body in the country under direct authority of the president. The transition in 1964 was characteristically smooth and involved a significant amount of overlap and elite circulation.

The continuity in and predictability of Mexican health leadership enabled more effective long-term planning and policy development within the Secretariat. Moreover, the circulation of elite actors within different government institutions and agencies and overlapping actor networks
increased the likelihood that there would be more continuity in policy and overarching approaches to public health issues based on the common origins and career trajectories of Mexican public health elites during this period of time. These networks and elite circulation also facilitated greater collaboration and coordination of health initiatives. The effects of stability, continuity, and overlapping elite actor networks within the Mexican health sector played an essential role in the development and institutionalization of polio immunization campaigns throughout the 1980s as well, as will be seen in the Mexican case study in chapter six.

**Domestic Research and Laboratory Capacity**

Another significant advantage that Mexico had relative to other Latin American countries during the 1950s and 1960s and linked to Mexico’s broader health system capacity, concerned domestic health research and training capacity and domestic laboratory capacity. As discussed in chapter two, by the time the first polio vaccine was developed in 1954/1955 Mexico was unique in the Americas in that, unlike every other country in the hemisphere with the exceptions of Canada and the United States, Mexico had the domestic capacity to produce its own polio vaccines. Mexico’s domestic public health laboratory advantage relative to the rest of Latin America continued to increase throughout the remainder of the 1950s. Between 1957 and 1960 the number of public health laboratories in Mexico increased from 121 to 136, the biggest increase of any country in Latin America for which data is available with the exception of Colombia. The number of public health laboratories in Colombia increased from just three labs in 1957 to 20
labs by the middle of 1960.\(^{164}\) The number of public health laboratories in Mexico in 1957 was already significantly higher than any other country in region with the exception of the United States.\(^{165}\)

Mexico also had an additional advantage relative to other countries in Latin America concerning not only domestic virology and immunology laboratory capacity but also research and training capacity. This was thanks in large part to significant support for domestic scientific and medical research and training facilities and institutions in Mexico starting in the early 1940s and comparatively strong coordination among different institutions thanks in part to overlapping networks of actors and the stewardship of the Federal Government and Secretariat of Health. For example, several key institutions involved in polio and immunology research were established in the 1940s by presidential decree. The first was Mexico’s Hospital Infantil that was founded in 1943 by internationally renowned pediatrician Dr. Federico Gómez in Mexico City. The Hospital Infantil quickly became the largest children’s hospital in Latin America and was known as one of the world’s foremost pediatric research, training, and service institutions.\(^{166}\) In addition to the Hospital Infantil, the National Institute of Cardiology and National Institute of Nutrition were similarly established by presidential decree in 1944 and 1946.

All three institutions housed laboratories lead by prominent immunologists who became part of a powerful actor network that emerged in the 1950s and that would become influential in subsequent immunology and related research throughout the 1960s and 1970s. The Hospital Infantil in particular became a central hub for polio and related research during the late 1940s and throughout the 1950s, and housed several key laboratories where leaders in Mexican polio

\(^{164}\) (PAHO), "Summary of Four-Year Reports on Health Conditions in the Americas, 1957-1960," 68. It is problematic that there aren’t comparable data on public health laboratories reported by Brazil during this period, however from other data sources it is clear that Brazil also had comparatively strong domestic capacity in this area.

\(^{165}\) Ibid.

\(^{166}\) Tucker, Mexican Government Today, 340.
and immunology research such as Manuel Ramos Alvarez and future Health Minister Jesús Kumate went on to work.\textsuperscript{167}

All three institutions were formally independent (meaning they were not under any secretariat nor affiliated with a parent-institution) although they received over 50\% of their funding from the federal government through the Secretariat of Health and had a board of directors with the sitting Minister of Health serving as chairman of the board.\textsuperscript{168} All three institutions collaborated with the Secretariat of Health, the Institute for Social Security, the National Autonomous University and National Polytechnic Institute, and also with one another.\textsuperscript{169}

The high level of involvement of senior officials from the SSA in research initiatives at the different institutions and linkages to other domestic research and training networks was increasingly common in Mexico, especially, as will be seen, starting in the 1980s with Ministers of Health Guillermo Soberón (1982-1988) and Jesús Kumate (1988-1994). This trend can be seen at the end of the 1950s related to polio vaccine studies conducted in Mexico. In the late 1950s, both the Minister (José Alvarez Amézquita) and Vice-Minister of Health (Miguel Bustamante) were actively involved in live polio vaccine research in Mexico and both co-authored studies presented at international polio conferences in the late 1950s and early 1960s alongside leading actors such as Manuel Ramos Alvarez and Hospital Infantil founder Federico Gómez.

\footnotesize{167} As discussed in the previous chapter, Dr. Federico Gómez of the Hospital Infantil was one of the original researchers involved in Mexico’s live poliovirus vaccine studies along with Manuel Ramos Alvarez. Gómez’s involvement in the studies undoubtedly gave them additional domestic legitimacy within Mexican public health elite circles based on Gómez’s stature, reputation, and personal and professional networks.

\footnotesize{168} “Biomedical Research Policy in Latin America: Structures and Processes,” 166.

\footnotesize{169} Ibid., 191.
The combination of clinical and more applied research as well as the collaborations between public health officials, medical faculty, and laboratory researchers in Mexico stands in contrast to Brazil during this period of time. Brazil had comparable clinical and laboratory expertise, institutional capacity and longstanding immunology and virology research traditions, however there were not the same kind of clear linkages between clinical and applied work, and collaborations between public health officials and researchers and their respective institutions. These collaborative initiatives and linkages between government health programs and research institutions helped formally integrate research and policymaking in Mexico earlier than in most other Latin American countries. They also helped to establish the promotion of research and collection and circulation of evidence and information, as core stewardship functions of the Federal Government.

The inclusion of research as part of immunization program planning made it possible for public health officials examine the limitations of existing programs and in some cases, adjust them accordingly. This can be seen in the case of early polio immunization campaigns where immunization schedules and doses administered were adjusted based on the results of laboratory studies indicating that existing schedules weren’t producing sufficient immunity among immunized populations. Based on the results of the ongoing studies included in the program from its inception, it was possible for public health officials to adjust their strategies to achieve better outcomes.

The collaborative character of Mexico’s research and training programs and the influence of domestic communities of experts and overlapping actor networks can be seen the second half of the 1960s with the establishment of a regional immunology research and training center in Mexico City. As more and more immunizing agents became available in the Americas and more
and more countries began carrying out immunization campaigns, there was an increase in
demand for domestic public health laboratory capacity and trained immunologists and laboratory
personnel. In response the WHO/PAHO worked with domestic government officials to build
domestic capacity and create collaborative multi-country training institutes to serve countries in
the Americas that lacked their own immunology research and training programs.

The first regional center was established in Brazil in 1965 (discussed previously) with a
second center established in Mexico during the second half of the 1960s. Unlike the Brazilian
center established in São Paulo, the Mexican center was a collaborative initiative that included:
government laboratories under the Secretariat of Health and Welfare and the Institute for Social
Security (IMSS); independent institutions including the Hospital Infantil and the National
Institute of Cardiology; university departments from both UNAM and the National Polytechnic
Institute. Future Minister of Health Dr. Jesús Kumate was tapped to coordinate the center at the
end of the 1960s.

A 1965 PAHO report credited Mexico’s emerging domestic community of experts related
to immunology and biomedical research combined with the stable domestic environment as
having facilitated the significant advances made in domestic research and training programs and
also the establishment of strong domestic health research institutions. The report states, “In
recent years a number of very fine training centers in the biomedical fields have been set up
which have been serving not only Mexicans, but scientist from all of Latin Americas a well as
from North America.”\textsuperscript{170} The report notes the “general political stability” in Mexico during the
past 40 years “is reflected in the stability of many institutions - including universities and
research institutions.”\textsuperscript{171} In addition to the positive influence of political stability the report goes

\textsuperscript{170} Ibid., 195.
\textsuperscript{171} Ibid., 194.
on to give the bulk of the credit to Mexico’s domestic actors and communities of experts. The report states:

A large number of scientists who have had advanced training in North American and European Institutions and who have become accustomed to research as an integral part of their professional activities, are becoming leaders in science. This group may well be the most important factor in the future development and organization of research. They are on the staffs of the centers and Institutes mentioned above. They give guidance in organizing programs. They get together to have their voices heard in terms of policies. They are involved in training others who will probably absorb their points of view. These people will be the future leaders in the scientific field.172

Many of the leaders cited in the 1965 report as well as a range of reports and evaluations of Mexico’s research, training, and public health programs during this period, were also key actors within the Secretariat of Health and Welfare as well as involved in polio and related immunology work. This combination of having high-level government leaders who were actively engaged in immunization and related research as well as the overlapping networks linking both individuals and institutions, undoubtedly contributed to the priority given to immunization in Mexico during this period of time. It also undoubtedly contributed to Mexico’s comparative successful program development and implementation during this period as well. A similar convergence of domestic actors, interests, and overlapping actor networks, emerges as a critical factor in the third implementation episode discussed in chapter six during the 1980s.

Mexico Case Study Summary

Polio vaccination in Mexico increased gradually after the Salk vaccine first became available in 1955 and then expanded dramatically starting in 1960 once public health officials began a more intensive nationwide immunization campaign. In 1960 the campaigns made use of both inactive

172 Ibid., 195-96.
Salk vaccine and the live oral polio vaccine, however starting in 1961 the live oral polio vaccine largely replaced the inactive vaccine concurrent with a dramatically scale up of vaccination efforts the following year. The total number of children vaccinated in Mexico almost doubled between 1961 and 1962. No other country in Latin America had a similarly dramatic and consistent increase in and expansion of polio vaccination during this period with the exception of Cuba. All other Latin American countries where data is available show much more erratic increases in vaccinations administered from year to year with much less visible trends indicating that an intentional and well-planned scale-up of vaccination activities was taking place.

Compared to other polio immunization programs in Latin America during this time period, the Mexican campaign was more effective than most. The causal logic behind Mexico’s success can be summarized as follows. First, Mexico’s proximity to the United States created both threats and opportunities that were not shared by any other country in Latin America. Mexico had greater and easier access to polio-related information and innovations produced in the United States as evidenced by Mexico’s early Salk vaccine access. However, Mexico also had greater threats related to polio than any other country in Latin America in terms of proximity to the source of the disease. Mexico’s proximity to the United States (where the highest polio incidence in the region was reported prior to the second half of the 1950s) increased the risk in Mexico of possible imported cases of polio from the United States. With a very real threat and 2,000 miles of shared borders, polio was on the Mexican policy agenda before it had even become a problem in epidemiological terms in Mexico as evidence by the fact that polio became a notifiable disease in 1937 when the disease was all but unknown.

Second, the fact that the disease was easily transmissible across borders, both domestic and international, meant that polio was clearly a Federal Government responsibility under the
Mexican Sanitary Code. Mexican public health precedent clearly established stewardship role of the Federal Government relative to subnational units on all matters pertaining to the control and prevention of disease throughout the entire country. This precedent increased the authority and capacity of the Federal Secretariat of Health in a number of ways. The Secretariat had the authority to impose public health legislation in states, could directly intervene in the public health affairs of states if state-level initiatives were viewed as inadequate, and had the support of a federal health official appointed in each state who was responsible for coordinating national and subnational actions and supporting the health priorities established by the national government.

Third, Mexican health system capacity was stronger than many other countries in the region during the late 1950s and early 1960s in several key areas. After having made polio a notifiable disease in 1937, data on polio had been systematically collected and reported to central government officials on at least an annual basis. Also, while the surveillance system in Mexico (like in most countries) was limited to data collected from health centers and areas with access to services, Mexico’s surveillance system was national in scope. As a result, during the second half of the 1950s when polio vaccines became available, Mexican public health officials had nearly twenty years of polio surveillance data to use to guide policy decisions. An additional health system capacity advantage in Mexico concerned domestic laboratory and vaccine production capacity. Mexico had the strongest polio-related domestic laboratory capacity in Latin America as of the second half of the 1950s, and was the only country other than Chile where domestic laboratory capacity was sufficient to conduct live vaccine studies entirely in house. Additionally, Mexico was the only country in Latin America that had the domestic vaccine production capacity
to produce its own polio vaccines. As a result, Mexican public health officials had fewer resource constraints than other countries in Latin America during this time period.

Fourth, polio programs in Mexico benefited from high levels of political and administrative stability and continuity in Mexico and overlapping elite actor networks within the health sector and other government institutions. Dating back to the establishment of the Secretary of Health in 1943, leadership turnovers were extremely infrequent and predictable according to Mexico’s six-year presidential terms. The stability of leadership enabled continuity in health programming and facilitated more gradual and incremental program development. Overlapping elite actor networks and the circulation of Mexican elites among government institutions, created opportunities for collaboration between researchers and public health officials that facilitated the early integration of research into policymaking and helped Mexican public health officials more effectively adapt programs as needed.

Cross-Case Comparisons and Conclusions

Throughout much of the 1960s PAHO’s polio-related work was largely uncoordinated and carried out on a country-by-country and as-needed basis. The Organization assisted Member Nations in purchasing polio vaccines needed for national immunization efforts and helped by “solving urgent problems in emergency situations.” Additional short-term technical advisory services were provided to Member Nations to assist in planning mass immunization campaigns. In examining the Annual Reports and other documents from both PAHO and individual Member Nations, it is clear that there is a lack of consensus concerning “best practices” for polio

immunization programs. In the Annual Report for 1965 Dr. Horwitz stated, “If the impressive reduction in the incidence of poliomyelitis in the United States of America is anything to judge by, systematic immunization should be given in health centers.”¹⁷⁴

However, in the vast majority of Latin American countries systematic immunization given at health centers wasn’t a viable option based on the myriad implementation constraints cited earlier in this chapter. PAHO reports, technical documents, and meeting proceedings from the 1960s, identify a broad range of implementation constraints found in the majority of countries in the region concerning immunization programs. However, it wasn’t until the end of the 1960s that any real strategy or coordinated plan at the regional level was developed to address the situation.

Ultimately, in the absence of stronger and more effective technical cooperation provided by PAHO on polio and/or immunization initiatives more broadly, effective policy implementation was largely dependent on domestic conditions and factors during the first half of the 1960s. The key factors that influenced cross-national variation between Brazil and Mexico during the late 1950s and first half of the 1960s included: (1) domestic public health precedent including norms of state-intervention in public health, a culture of prevention, community mobilization, and existing vaccination legislation; (2) geoepidemiological factors including shared borders, risks of disease importation, and access to information and new innovations; (3) the stewardship role of the central government and stewardship functions provided by the Ministry of Health for the control and prevention of diseases; (4) health system capacity including domestic laboratory and research capacity, subnational implementation capacity, disease surveillance and reporting; (5) the role of external actors and influences; (6) the influence

of domestic communities of experts in policy making and role of transnational actor networks. The variation in these key factors is examined in the following sections.

Administrative Capacity: Authority and Responsibility of the Central Government

Arguably the starkest contrast between Brazil and Mexico as relates to the issue of public health during the period covered in this chapter, concerns the stewardship functions and capacity of the central government and Ministry of Health, and central government authority relative to subnational units in the two countries. In many ways the two reside on opposite ends of a federalist spectrum concerning their respective powers and responsibilities on matters of public health relative to state and municipal authorities. The Federal Government in Mexico was clearly appointed the steward of the nation’s health in the Mexican Constitution in 1917 and subsequent sanitary codes, and thus assumed responsibility for the vast majority of issues related to disease prevention and control and basic public health throughout the entire country.

In contrast, the Brazilian Federal Government had no clear stewardship role or capacity and assumed responsibility for and power over only those diseases and issues deemed to be of utmost national importance. Moreover, these diseases and issues weren’t clearly or consistently defined and were subject to change based on changes in leadership and changing priorities of the national government. Gilberto Hochman’s work on smallpox and the Brazilian public health agenda examines how responsibility for and federal government involvement in anti-smallpox campaigns fluctuated throughout the first half of the 1900s, and the ways in which these fluctuations helped Brazil become the last country in the Americas to eliminate smallpox.

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175 Constitutions were passed in 1934, 1937, 1946, and 1967. The current Constitution was drafted in 1988.
The Federal Government in Mexico consistently viewed any and all communicable diseases as the responsibility of the Federal Secretariat of Health. State and local governments were responsible for helping the Federal Government in its efforts to control and prevent diseases. Additionally, due to the stability and continuity within Mexican government institutions and especially the Secretariat, there weren’t significant fluctuations in policy priorities or changes in government responsibility for specific diseases, as was the case in Brazil. As a result, when polio campaigns were launched in Mexico whether in the 1950s or throughout the 1960s, they were launched under the auspices of the Federal Government and also with its resources and according to its regulations. All of these different factors are related to the stewardship functions and capacity of the Federal Government and Secretariat of Health in Mexico.

Another key factor that shaped the capacity of the ministries of health in Brazil and Mexico was political and administrative instability. Between 1956 when the Salk vaccine was first adopted in Brazil, and the end of March when the Brazilian military took power, Brazil had 11 different Ministers of Health. During the period of time in which mass immunization campaigns with the live polio vaccine were implemented between April of 1961 and April of 1964, there were seven different Ministers of Health, none of whom remained in their position for a full year.\textsuperscript{176} In stark contrast, during the same period of time (from 1956 to 1964), Mexico had two Ministers of Health, both who served their full six-years terms. Additionally, there was considerable continuity in policies and priorities form Minister-to-Minister with a high level of elite circulation across different administrations and among different government ministries. As a result, in Mexico there was more effective long-term planning and it was possible to take a

longer time-horizon on policy development with programs being incrementally scaled up without concern that a sudden change in leadership might derail existing programs. The opposite was true in Brazil in many ways. The extreme instability and frequent turn-overs made it difficult to establish the continuity in programming and priorities that was necessary to develop effective programmatic guidelines or work through various implementation challenges that emerged in the course of expanding programs beyond the initial pilot sites.

The Role of External Actors and Influence

An additional contrast between Mexico and Brazil during this period of time concerns their international relations, especially relative to the United States, and the role of external actors and foreign assistance in domestic public health initiatives. Mexico never received any formal technical cooperation from PAHO with designing or implementing polio immunization campaigns during the 1950s or first half of the 1960s. Evidence from Mexico’s prior history with vaccination campaigns against diseases including smallpox, indicates that there was sufficient domestic expertise related to immunization campaign planning in Mexico. For example, PAHO reports highlight Mexico’s successful nationwide immunization efforts to combat smallpox in the late 1940s resulting in the total elimination of smallpox in Mexico in 1951. Mexico eliminated smallpox through effective domestic initiatives with minimal external involvement a full twenty years before Brazil eliminated smallpox in 1971, and before most other countries in Latin America eliminated smallpox later in the 1950s and early 1960s.

While Mexico’s domestic expertise was relatively strong during this period, PAHO’s capacity related to health policy planning and immunization programs was still relatively limited. Additionally, unlike other countries in Latin America, Mexico did not need significant technical
assistance concerning vaccine production or serological studies. When the live vaccine field studies were first initiated in the Americas in 1957, it was reported that Mexico was one of only two countries (including Chile) where domestic virus laboratory capacity was sufficient to conduct the proposed studies fully in house without the need of external assistance.

Brazil received a significant amount of support and assistance from PAHO on various aspects of the polio campaigns in the early 1960s. Brazil did not have the same sort of domestic communities of experts or large well-trained cadres of public health personnel during this period of time (with the exception of considerable expertise on diseases such as malaria and chagas disease), which made Brazil more reliant on external advisors for immunization initiatives. Brazilian public health officials requested and received advisory support from PAHO in planning and conducting both pilot campaigns conducted in 1961 in São Paulo and Rio de Janeiro. Additionally, Brazil received consistent and constant technical support regarding virus laboratories and laboratory support for the polio campaigns in the early 1960s. Moreover, during periods of major political instability, PAHO consultants were sent to help with the day-to-day operations of virus laboratories at government institutions such as the Oswaldo Cruz Institute’s enterovirus laboratory. While support from external actors such as PAHO could not sustain polio efforts in the absence of greater domestic initiative and capacity, PAHO did play an important role in launching the initial campaigns and providing technical support to Brazilian laboratories to help develop domestic laboratory capacity.

Another contrast between Brazil and Mexico during the 1950s and 1960s (and historically) concerns the two country’s respective relationships with the United States relative to the rest of the Americas as well as regional and international organizations. Anne-Emanuelle Birn describes Mexico’s “public health trajectory” as one “marked by numerous domestic and
international influences, a bold state-building imperative, popular and revolutionary demands, and pro-sovereign sensibilities.”\textsuperscript{177} The relationship between Mexico and the United States on matters of public health in many ways reflected Mexico’s “professional defiance” of the United States and insistence on working with the United States as an equal partner. Marcos Cueto explains that United States government officials were “aware that Mexican governments were subject to local pressures to adopt strong nationalistic attitudes and not to rely too heavily on foreign aid. This also meant the existence of a proud local political tradition of Mexico solving social problems by itself.”\textsuperscript{178} Evidence of this collaborative, but also at times contentious, relationship between Mexico and the United States can be seen in the exchanges between the two countries related to polio innovations and policy responses throughout the second half of the 1950s.

In contrast, Brazil’s “special relationship” with the United States during this period was marked by much greater U.S. influence in Brazil’s domestic public health agenda and greater dependence on external actors (especially the United States) to support public health initiatives. While the Quadros-Goulart period from 1961 to the time of the military coup at the end of March of 1964, marked a significant, albeit ephemeral, shift in Brazilian foreign relations, throughout the remainder of the 1960s the Brazilian military regime remained closely aligned with the United States. As a result of Brazil’s foreign relations, resource constraints, and domestic political instability, Brazil was also more vulnerable to shifting international health priorities than Mexico. Brazil, unlike Mexico, became increasingly reliant on external actors and foreign aid at the end of the 1950s. Gilberto Hochman explains that due to the Kubitschek

\textsuperscript{177} Anne-Emanuelle Birn, \textit{Marriage of Convenience: Rockefeller International Health and Revolutionary Mexico} (Rochester NY: University of Rochester Press, 2006), 268.
\textsuperscript{178} Marcos Cueto, \textit{Cold War, Deadly Fevers: Malaria Eradication in Mexico, 1955-1975} (Johns Hopkins University Press, 2007), 82.
administration’s priority for large-scale infrastructural projects to support economic development and the costs associated with moving the Brazilian capital to its current location in Brasilia planned to take place in 1960, by the end of the 1950s the Brazilian government was short on funds to support public health programs. The need for external assistance created incentives for Brazilian actors to shift domestic public health and development priorities towards greater alignment with the priorities of international organizations and major donors such as the United States. In the mid-1960s this shift resulted in the rise of smallpox to the top of the Brazilian public health agenda, rendering polio largely invisible as a policy priority until the early 1970s.

The examples in this chapter from Brazil and Mexico, and also from Cuba, highlight how significant variation in domestic conditions and capacity, affected variation in domestic policy outcomes, especially the extent to which immunization campaigns were effectively implemented during this period. However, as chapter four shows, the progress made during the first half of the 1960s in Mexico was far easier to achieve than sustaining and building upon that progress would be, creating new implementation constraints that were not unique to Mexico, but rather common throughout Latin America during the late 1960s and early 1970s.

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180 Ibid; "Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda."
CHAPTER 4
IDEALS & INSTITUTIONS: IMPLEMENTATION ATTEMPTS IN THE EARLY 1970s

“Between the taking of decisions and their implementation, there is a gap which will be all the wide as intentions are less strong and structures and administration are weaker.”
-- PAHO Director, Dr. Abraham Horwitz, 1965

In spite of the fact that every country in Latin America had adopted polio vaccines for use in domestic immunization programs by 1961, by the end of the 1960s it was clear that polio continued to be a problem in the Americas. The highly effective Cuban polio program and other positive, albeit less dramatic, examples from the region like Mexico's initial success, indicated that the primary issues impeding polio control were administrative rather than epidemiological. When systematic vaccination was consistently carried out - whether through routine immunization services, mass campaigns, or some combination of the two - polio incidence fell. When mass campaigns were conducted sporadically and routine immunization provided only to those with access to existing health services, polio persisted and often emerged in epidemic form.

Throughout the 1960s, PAHO provided a range of services to Member Nations to help with domestic polio efforts. However, in many ways, PAHO’s polio-related work was constrained by the same factors that constrained domestic immunization programs. Polio-specific assistance was largely uncoordinated, was not provided in any systematic or consistent way, and was primarily provided in response to domestic polio-related emergencies. In other words, PAHO failed to provide basic stewardship functions to its Member Nations.

As a result of the persistent failures of both domestic governments and PAHO itself, polio emerged on the regional policy agenda at the end of the 1960s. After a series of technical discussions on polio within PAHO’s various governing bodies, resolutions calling for a centrally coordinated regional polio control program were adopted in 1968 and 1971. PAHO’s Annual Report for 1971 justified the resolutions stating:
It would be difficult for technology to produce a more simple and more efficient prevention method; it is administered orally, does not create harmful side-effects, and produces prolonged immunity. Like smallpox, poliomyelitis should disappear from the Americas in this present decade.¹

In spite of this optimistic prediction it would take another twenty years before the last case of polio was reported in the Americas in August of 1991.

The case studies in this chapter demonstrate that, while regional resolutions did influence domestic policy adoption decisions, in the absence of stronger domestic capacity and changes in local conditions, immunization programs were derailed during the implementation and institutionalization stages of the policy process. Additionally, while PAHO did work to establish stronger centralized or stewardship functions and more coordinated technical cooperation related to polio in the late 1960s and early 1970s, it would take a more fundamental change in ideology as well as institutions during the mid-1970s, to make PAHO’s technical cooperation and leadership influential in the region beyond the adoption phase of the policy process.

This chapter uses case studies from Brazil and Mexico between 1968 and 1974 to examine how interactions between domestic and external factors influenced the adoption, adaptation, and implementation of intensified polio campaigns in both countries. The primary factors influencing cross-national variation during this timeframe include: (1) geoepidemiological factors including Mexico’s proximity to the United States and increasing pressure placed on Mexico as polio was largely eliminated in the United States; (2) domestic public health precedent in each country and the extent to which previous experiences influenced subsequent policies; (3) stewardship functions provided by the central government and Ministry of Health and the power of the central government relative to subnational units; (4) health system

capacity, both national and subnational, including disease surveillance, population covered by the health system, and the delivery of basic health services.

This chapter begins with an overview of the polio situation in the region and public health debates during the late 1960s and early 1970s. This is followed by a case study on Brazil’s National Polio Control Program (NPCP) adopted in 1971. The overarching theme within the Brazilian case study concerns a failure to learn from previous domestic experiences and highlights the limited stewardship capacity of Brazil’s central government institutions and the health system more broadly. Ultimately, the NPCP replicated many of the mistakes that derailed previous polio immunization efforts in the early 1960s and failed to learn from the more effective smallpox campaign launched in the late 1960s. The NPCP was abandoned within two years of its launch and never included more than 14 out of Brazil’s 27 states.

In contrast to Brazil, the Mexican case study starting in 1968 demonstrates the significant influence that Mexico’s own domestic experiences, as well as examples from other countries, specifically the Cuban polio model, had on immunization policy development in Mexico. Domestic actors learned from evaluations of previous immunization efforts, evidence and operational research generated by domestic researchers and public health officials, and evaluations of potentially salient external policy models. Additionally, policies were developed and implemented in a more gradual and incremental way, and progress (as evidenced by decreasing polio incidence) although gradual, was largely sustained throughout the second half of the 1960s and 1970s. Although Mexico’s progress plateaued in the mid-1970s and did not accelerate again until the early 1980s, the precedent of learning-based policy development established by programs in the 1960s and 1970s, helped to facilitate the more dramatic progress
achieved in Mexican immunization programs during the second half of the 1980s and early 1990s (discussed in chapter six).

**Regional Overview: Addressing the Gap Between Ideals and Institutions**

When Dr. Abraham Horwitz replaced Dr. Fred Soper as PAHO Director in 1959, there was a visible shift in ideology within the Organization. However, throughout the 1960s it became increasingly clear that the ideals promoted by Horwitz and many of his colleagues at PAHO and the broader development objectives outlined in documents such as the Charter of Punta del Este, did not reflect the institutional reality in most countries in Latin America at the time. In many ways, the strategies promoted in the region during the 1960s and outlined in the Charter of Punta del Este in 1961, exemplified more top-down implementation structures and centralized diffusion models, whereby policies and priorities are driven by more powerful actors in industrialized countries without sufficient attention to the specific needs of potential users or adopting countries.

Rather than looking to other similarly situated developing countries for possible policy models, Latin American countries were encouraged to look to and aspire towards the models developed in more advanced industrialized countries such as the United States. However, documents during the early 1960s rarely provided coherent strategies outlining how countries with dramatically different domestic conditions, might achieve similar progress. More specifically, there was only limited recognition within PAHO reports during the early 1960s, that policy models from more advanced industrialized countries like the United States, weren’t likely to travel well or be similarly effective when implemented in different contexts.
By the end of the 1960s there was only one country in the entire hemisphere that had effectively eliminated polio and it had done so by developing its own program that was not reflective of the recommendations made by PAHO at the time and was instead tailored to suit its own specific domestic conditions. Cuba eliminated polio in the early 1960s using national immunization days conducted twice a year, every year. Cuban public health officials had assessed their own domestic situation in 1959 and had been clear that routine immunization services conducted in existing health facilities would have replicated the inequalities of the pre-existing health system that the new government was trying to resolve. The Cuban innovation - using large numbers of volunteers to bring vaccinations house-to-house throughout the entire country during several national immunization days and relying on collaboration from actors beyond the health system - was a way to get around existing domestic capacity constraints. More importantly, and as will be discussed in greater detail in chapter six, Cuban public health officials used the seemingly highly targeted vertical polio campaigns, as a platform to develop other more comprehensive programs and as the foundation for its national immunization program launched later in 1962.

Driven by the highly visible example in Cuba and the limited progress made in other countries throughout the region, PAHO Member Nations placed polio back on top of the Organization’s agenda at the end of the 1960s.²

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² The Pan American Sanitary Bureau launched a regional campaign to eradicate smallpox in 1949 that was followed by a global eradication initiative launched by the World Health Organization in 1967. The Americas became the first region in the world to effectively eliminate smallpox in 1971.

In their work on policy evaluation and policy learning Howlett et al. explain that policy evaluation is “the stage of the policy process at which it is determined how a public policy has actually fared in action.” During the early 1960s there wasn’t enough information about how polio immunization policies had “fared in action” in Latin America to support a productive dialog among public health officials in the region. However, by the end of the 1960s the cumulative experience with polio vaccination campaigns and vaccination more generally in the Americas had increased significantly. After adopting polio vaccines in the late 1950s and early 1960s, during the course of the following decade, virtually every country in the Americas had adopted and attempted to implement some form of large-scale polio immunization campaign. As a result, it became possible to evaluate and exchange different domestic vaccination experiences in an effort to gain a better understanding of common implementation constraints and possible strategies to mitigate them.

The status of polio in the Americas was a topic of discussion at the XVII Meeting of the PAHO Directing Council held in Trinidad and Tobago in October of 1967. The Directing Council acknowledged that, “the disease continued to be a serious problem in spite of the existence of a very effective vaccine.” Accordingly, the Directing Council recommended that Member Nations should conduct “systematic general immunization programs in which priority attention is given to the most vulnerable age groups.” However, due to the observed experiences in countries throughout the region prior to 1967, it was also acknowledged that the ideal strategy of routine immunization services was not realistic for many countries, or within many countries in certain hard-to-reach areas. Based on this recognition, the Directing Council also

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recommended that, “without prejudice to their continuing the regular immunization program, the Governments endeavor to achieve the highest immunity level as quickly as possible by conducting mass oral vaccination campaigns.” The basic objective was to cover the largest number of susceptible individuals in the shortest period of time in order to break the chain of transmission.

The more dynamic and flexible strategies recommended by PAHO in the late 1960s and early 1970s more accurately reflected and responded to the needs of PAHO Member Nations. Additionally, official PAHO documents between 1967 and 1971 suggest a clear consensus among Member Nations that it wasn’t just domestic programs that needed to be strengthened but also PAHO’s centralized functions and coordinating capacity as well. In his introduction to the Annual Report for 1967, PAHO Director Abraham Horwitz stated, “The time has come to draw up a real continental plan for the elimination of poliomyelitis.”

Our Man in Havana: Dr. Sabin in Cuba

Shortly following the October 1967 Directing Council meeting, Dr. Albert Sabin traveled to Cuba as a guest of the Cuban Ministry of Public Health along with PAHO Director Abraham Horwitz. While in Cuba, Dr. Sabin got an opportunity to thoroughly evaluate Cuba’s national polio immunization program launched in February of 1962. In an interview published in Cuba’s official newspaper Granma, Dr. Sabin stated, “I’m a very critical person, particularly in the field in which I have some competence and knowledge, and I wanted to make sure that this elimination of polio was not a statistical one, on paper, but it was a real one.”

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5 Ibid., 134.
6 Horwitz in Ibid., xxii.
7 Dr. Sabin was first invited to Cuba to observe Cuba’s national polio immunization campaign in October of 1962, however the Cuban missile crisis quickly derailed his travel plans and he was forced to postpone his visit.
continued, “On the basis of the information that I have seen, one can rest assured that there has actually been a complete elimination of poliomyelitis in Cuba.”

Dr. Sabin praised the “tremendous and beautiful decentralization” of Cuba’s National Immunization Days saying that they were organized “like clockwork.” He continued explaining:

I couldn’t believe how it is possible to achieve an immunization of 98 or 99 percent of all the children in the nation. Apparently, it is this extraordinary organization which works not only in a single year as a momentary, transitory effort, but is done year after year…I think it is a very remarkable example of an extraordinarily efficient public health organization with the cooperation of the general public.

In a written report to U.S. government officials upon his return to the United States, Dr. Sabin wrote, “I believe the elimination of polio in Cuba appears to be a fact, making it the only country in Latin America where polio has been completely eliminated, and certainly has affected a control that no other country in Latin America has even approached.”

The following year, in 1968, PAHO enlisted the help of Dr. Sabin and Dr. Dorothy Horstmann of the Yale Polio Unit, to develop a proposal for a regional polio control program. The plan proposed by Drs. Sabin and Horstmann was heavily influenced by what Dr. Sabin had recently witnessed in Cuba in December of 1967 and what both experts had observed in the Soviet Union and Czechoslovakia in the late 1950s and early 1960s where mass immunization campaigns had first been effectively used. In 1959, in the aftermath of the First International Live Poliovirus Vaccine Conference hosted by PAHO, there was considerable skepticism within the United States about the validity of the results presented at the conference by Soviet and other Eastern European delegations on live polio vaccine field trials conducted in these countries.

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8 Interview with Albert Sabin, published in Granma, December 24, 1967.
9 Ibid.
10 Ibid.
11 Sabin trip report from 1967 trip, report located in the Sabin Archives in a file that says Cuba 1968. ABS Archives, OPV, Correspondence, B2F2 (Cuba).
In an effort to mitigate the uncertainty surrounding these studies, the World Health Organization commissioned Dr. Horstmann to evaluate the field trials and the largest mass campaigns ever conducted with the live oral polio vaccines.\textsuperscript{12} Her highly favorable report was presented to the WHO, and, although never published, was circulated extensively helping to increase support for live vaccines studies within the United States and providing important innovation evaluation information to members of the scientific community and public health officials in countries throughout the world.\textsuperscript{13} One of the outstanding observations in Dr. Horstmann’s report concerned the highly effective use of mass organizations, public information campaigns, and community mobilizations to ensure maximum immunization coverage.

According to the proposal outlined by Drs. Sabin and Horstmann in 1968, PAHO would be responsible for providing a range of centralized functions to all Member Nations, who would bear the ultimate responsibility for policy implementation. The centralized functions outlined in the 1968 (and subsequently 1971) resolution were largely based on the various domestic implementation constraints reported by countries throughout the region during the 1960s. Rather than providing a more generic and one-size-fits-all menu of technical cooperation to countries in the region based on PAHO’s existing capacity, as had been the case during the early 1960s, the 1968 and 1971 resolutions demonstrate the emergence of a more dynamic and country-driven approach to technical cooperation within PAHO.

The centralized functions in the 1968 resolution included: supplying Member Nations with oral polio vaccine; providing technical assistance for planning and organization of national immunization campaigns, outbreak response, and rehabilitation efforts; facilitating the

\textsuperscript{12} Dr. Horstmann spent six weeks from late August to early October of 1959 evaluating virus laboratories, the operation of immunization campaigns in different localities, the surveillance and reporting mechanisms used, and various other aspects of the campaigns in the Soviet Union, Czechoslovakia, and Poland.

organization of a network of polio diagnostic laboratories in the region; assisting with training of national program personnel to support polio campaigns; helping to organize surveillance systems; maintaining sufficient supplies of polio vaccines to meet emergency requests.\textsuperscript{14} The proposal for the regional polio control program was submitted to the Special Meeting of Ministers of Health of the Americas held in Argentina in October of 1968 at which point the principles guiding the program were approved and included in the Final Report of the meeting.\textsuperscript{15}

It is somewhat ironic that a meeting of the region’s Health Ministers that did not include Cuba approved the regional plan that was based largely on the Cuban polio control program. Cuba’s Minister of Health at the time did not participate in the Special Meeting because the Government of Cuba was neither a signatory nor a supporter of the Charter of Punta del Este, which provided the impetus for the 1968 meeting. Dr. Pareda Chávez, the Cuban representative to the 1968 PAHO Directing Council meeting that immediately followed the Special Meeting explained that the Cuban Government did not regard the Charter of Punta del Este as “an effective means of attaining the well-being of the American people.”\textsuperscript{16}

In order to support the proposed regional polio control plan, in 1968 a special polio unit was established in the Department of Communicable Diseases at PAHO Headquarters. This marked the first such unit explicitly focused on polio since the completion of the live vaccine field studies in 1961. Additionally, in 1968 PAHO signed an agreement with the Government of Mexico intended to increase Mexico’s domestic production of the oral polio vaccine to provide vaccines to other Latin American countries in support of the proposed regional polio control

\textsuperscript{15} The Special Meeting was held from October 14-18, 1968, immediately prior to the Directing Council Meeting.
\textsuperscript{16} XVIII Meeting of the PAHO Directing Council (1968): 26
program. In 1969 the Organization initiated a series of studies in an effort to determine the amount of vaccine and related supplies that would be needed to carry out the proposed regional polio campaign. In spite of these various organizational developments and Member Nation’s declarations of support for polio control, there was limited progress by the start of the 1970s. The Annual Report for 1970 stated:

Because of the lack of continuity in poliomyelitis vaccination programs, resulting from financial difficulties and the deficient health structure of the majority of Latin American countries, the epidemiological situation of this disease is not marked by any appreciable reduction of morbidity and mortality comparable to that achieved in the developed countries… Budgetary difficulties constitute the main obstacle to efficient vaccination campaigns, but inadequate coverage plans and in some instances poor preservation of the vaccine are also significant causes of the lack of success. As a result of these problems, the vaccination schedules programmed are not being completed. While a high percentage of susceptible persons receive the initial dose of vaccine, the number receiving the second dose is considerably less, and those given the third are fewer still. There is no way of establishing regular maintenance programs, so that sporadic vaccination continues to be the rule in practically all the countries, which means that the wild viruses persist in the area and as soon as a sufficient number of susceptible persons are forthcoming, outbreaks again recur.

On September 28, 1971, Dr. Albert Sabin addressed the XX Meeting of the PAHO Directing Council to discuss the polio situation in the Americas and revise the proposed regional control plan. The meeting provided an opportunity for public health officials throughout the region to evaluate and exchange experiences, while also seeking expert advice from Dr. Sabin as well as from one another. Throughout the course of the meeting, representatives identified a series of common constraints that had prevented greater progress in immunization programs thus far and in response a Working Group was established to draft a resolution outlining next steps to

18 Ibid.
be taken by both Member Nations and PAHO. The Resolution approved the following week stated that the Directing Council resolved:

1. To recommend to the Member Governments that they study their own situation in order to organize, intensify, expand or maintain, whichever is applicable, national poliomyelitis control programs.

2. To request the Director to coordinate the studies on poliomyelitis and the development of control programs in the Americas, and to provide the countries, within available resources, with technical and material assistance in planning, organizing, implementing, and evaluating the corresponding epidemiological surveillance programs.

3. To request the Director to provide the countries with all possible technical and material assistance in the event of the threat or the occurrence of epidemics.

4. To authorize the Director to establish a Special Fund financed by voluntary contributions, for the purpose of expanding available assistance and undertaking poliomyelitis control programs in the Americas.

5. To invite Member Governments to generously contribute funds, material, and equipment for the establishment and maintenance of the Special Fund so that the Organization may give effective and prompt assistance to the countries in their poliomyelitis control programs.

6. To request the Director to approach the United Nations Children's Fund (UNICEF) and other United Nations agencies or public and private institutions in order to obtain assistance for the poliomyelitis control program.

7. To establish a sufficient reserve of live attenuated poliomyelitis oral vaccine, the cost of which is to be borne by the Special Fund, to serve the needs for epidemic control and to be distributed to the countries in accordance with the needs of, and progress made by, the respective programs.

8. To request the Director, in agreement with the Member Governments and utilizing the manpower and material resources available, to take the necessary steps to promote the organization of a regional network of laboratories for the isolation, diagnosis, and typing of poliomyelitis virus; and to request the Member Governments of the countries in which these laboratories are established to facilitate their use by countries that do not have such laboratories.

On October 20, 1971, PAHO Director Horwitz wrote to Dr. Sabin thanking him for his participation in the Directing Council meeting. In his letter Horwitz stated, “The lively discussion that followed your exposition was a clear demonstration of the interest of the
delegates regarding the control of poliomyelitis.” Dr. Horwitz suggested that now that the national representatives from PAHO Member Nations had the information concerning the proposed immunization program at their disposal the decision as to what to do next was theirs. The following case studies on polio initiatives in Brazil and Mexico between 1968 and 1974 demonstrate that while regional resolutions did influence domestic adoption decisions, implementation continued to be driven primarily by domestic factors, despite PAHO’s efforts to enhance implementation capacity through technical assistance.

Brazil and the National Polio Control Program, 1971-1974

Starting in 1960 Brazil reported faster economic growth than virtually any other country in Latin America but slower declines in infant and child mortality. James McGuire explains Brazil’s unimpressive progress in improving infant and child survival dating back to 1960 as the result of “deficiencies in social policy.” Deficiencies in social policy are the focus of the following case study on Brazil’s polio immunization program in the early 1970s. In 1971, shortly after the PAHO Directing Council passed its polio resolution, Brazilian public health officials launched the National Polio Control Program (NPCP). However, the program was only minimally effective, quickly derailed, and abandoned only two years after its launch.

The key factors that constrained the NPCP and ultimately contributed to its abandonment can be summarized as follows. First, the Brazilian Ministry of Health had insufficient authority and capacity required to establish clear programmatic guidelines for the NPCP or to monitor or

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20 Letter from Abraham Horwitz to Albert Sabin, October 20, 1971. ABS Archives.
21 James McGuire, Wealth, Health, and Democracy in East Asia and Latin America (New York: Cambridge University Press, 2010), 149.
evaluate the NPCP in adopting states. The authority and power of the central government relative to subnational actors was still comparatively weak in Brazil and thus policy adoption decisions linked to the NPCP were entirely left to state-level actors. Only 14 states adopted the program and the central government had no authority to either enforce compliance in the adopting states or require adoption in others. Additionally and also related to the limited stewardship role of the central government, health and development initiatives more broadly were highly decentralized or regionalized, with each of Brazil’s five existing “macroregions” exercising control of development initiatives and collaborating with external actors such as PAHO on an individual state or macroregional basis. The extreme autonomy of subnational actors weakened the administrative capacity of central institutions including, but not limited to, the Ministry of Health.

Second, the NPCP was derailed by factors related to Brazil’s broader health system capacity. There was no national surveillance system for polio, no national immunization schedules, the health system was poorly coordinated, the public sector was being gutted while the private sector expanded, and the distribution of infrastructure and health services was highly unequal throughout the country.

Third, although Brazil had well-established domestic communities of experts and cadres of experienced public health personnel as a result of previous disease campaigns and training efforts, the relationship between the Brazilian military regime and the scientific/research community was tense and frequently antagonistic. Policymakers largely ignored the recommendations and evidence generated by researchers and domestic experts pursuant to the launch of the NPCP and thus repeated many of the mistakes that had derailed previous polio immunization efforts and that had also constrained the national smallpox campaign.
Lastly, shifting health priorities within PAHO and the WHO contributed to shifts in Brazil’s domestic policy agenda that further undermined the NPCP and contributed to its abandonment in 1974. These factors and interactions among them are examined in greater detail in the following case study.

Learning from Failure or a Failure to Learn: Brazil’s National Polio Control Program

When the National Polio Control Program (NPCP) was launched in late 1971, the program replicated many of the mistakes made during previous polio and smallpox campaigns, mistakes that would ultimately derail the NPCP and lead to its abandonment only two years after its launch. Like polio immunization campaigns in the early 1960s, the NPCP was an optional program that state health authorities could choose to participate in, and thus was national in name only. State level actors were in charge of all activities concerning the planning and implementation of the program and, beyond the vaccines provided by the Ministry of Health, were responsible for providing the resources required to support the program. Like the smallpox campaign starting in 1966, the NPCP focused almost entirely on mass immunization campaigns and did not include surveillance. Also like the early years of the smallpox campaign, the lack of surveillance and program evaluation, derailed the NPCP. In spite of the fact that Brazil had a large cadre of trained health workers who’d been involved in the smallpox campaign, and expert researchers who had been involved in the previous polio campaigns in the 1960s, rather than learning from previous failures, the NPCP was an example of a basic failure to learn.

In their work on policy evaluation and policy learning, Howlett et al. suggest that one possible explanation for policy failure relates back to the policy evaluation stage of the policy process. The authors explain that ineffective evaluation of the policy process or a failure to learn
from previous experiences can lead to policy failure. The authors cite two key factors explaining how policy learning can result in policy change. First, they cite the “capacity of government in terms of the level of training, skill, and professionalism of its employees.”

A second factor concerns the “nature of the policy subsystem and especially its open or closed nature.” In other words, policy learning is more likely when there is a strong community of experts with access to, or who are involved in, the policy process. While Brazil had a strong community of experts and a cadre of trained public health personnel, the closed nature of the policy subsystem in Brazil under the military regime, limited the access communities of experts had to the policy process. This was especially true during the early 1970s under the Médici administration as decision-making was increasingly centralized.

As a result, in the case of Brazil’s National Polio Control Program, it is difficult to identify effective policy learning that took place between either the first and second polio initiatives in the early 1960s and early 1970s, or between the smallpox eradication campaign and the polio campaign starting in 1971. In the first policy implementation episode in the early 1960s there were arguably insufficient sources of potential policy learning available to domestic public health officials. While Brazil had enacted mandatory vaccination laws to combat smallpox as early as 1904, in 1961 there weren’t directly applicable domestic precedents or previous policies that public health officials could potentially learn from. Additionally, Brazil suffered from a general shortage of trained public health personnel and had a comparatively small domestic community of experts in 1961.

However, research and training initiatives such as Brazil’s Regional Immunology Research and Training Center established in 1965, a range of medical and public health schools

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24 Ibid., 193.
25 Ibid.
established during the second half of the 1960s, and nationwide campaigns such as the smallpox eradication campaign, meant that by 1971, there was a much larger community of experts and a large cadre of well-trained and field-tested public health personnel. By the time the NPCP was launched in 1971, the situation concerning sources of potential policy learning had also changed significantly. In addition to a greater number of examples from other Latin American countries, Brazilian public health officials had the early 1960s polio immunization episode, as well as the national smallpox eradication campaign to draw on.

As Gilberto Hochman has argued, the Brazilian smallpox eradication campaign marked a major departure from previous public health campaigns in Brazil and set the foundation for the 1980 polio campaigns (discussed in chapter six). However, it doesn’t appear that there was much in the way of policy learning via policy evaluation that took place pursuant to the launch of the NPCP in 1971. Policy recommendations and research generated by domestic experts and veterans of previous campaigns were largely ignored and not reflected in the policies linked to the NPCP as the following case study demonstrates.

Credible Indicators and Disease Surveillance

The NPCP was constrained by a number of factors related to overall weaknesses of the Brazilian health system. One of the most glaring of these weaknesses, and an area where Brazil performed worse than arguably any other country in the Americas during the 1950s and 1960s, concerned disease surveillance and the availability and utilization of data in health policy development. Between September and December of 1971, Brazilian researchers carried out a pilot study to test the methods to be used in the national campaign. One of the primary recommendations made by the study was that surveillance systems were needed at both national and subnational levels to constantly monitor and evaluate immunization programs and allow adjustments to be made. The
study’s authors “recommended establishment of a nationwide surveillance system in order to obtain an accurate assessment of the effects of any vaccination efforts, and to convincingly demonstrate reduction or elimination of the disease.”\(^{26}\) The study’s emphasis on surveillance was in line with broader shifts within PAHO focusing on surveillance system development and training to help build domestic capacity in this area.

In 1971 PAHO and the U.S. Centers for Disease Control (CDC) co-sponsored a course on epidemiology that was the first of its kind to be jointly sponsored by the two organizations. PAHO stated that the joint initiative should continue, “[until] all the Governments have specialists capable of putting the epidemiologic surveillance activities into practice.”\(^{27}\) One of the Brazilian participants sent to participate in the course was Dr. João Baptista Risi Jr. Dr. Risi had been a young epidemiologist and recent medical school graduate when he was placed in charge of the smallpox epidemiology and surveillance program for the State of Guanabara in the late 1960s as part of the Brazil’s national Smallpox Eradication Campaign (CEV). In 1971 as his work with the smallpox campaign was winding down he was sent to participate in the new surveillance training program being conducted at CDC headquarters in Atlanta, Georgia. While in residence at the CDC Risi received word from colleagues back in Brazil that the Ministry of Health planned to launch a national anti-polio campaign in the coming months. Based on the new developments back in Brazil Dr. Risi selected polio as the topic of his final project for the CDC course: the design of a national disease surveillance system. Risi adapted the basic surveillance


system developed during Brazil’s national smallpox eradication effort as the logical foundation for his design.28

After completing his course at the CDC, Dr. Risi returned to Brazil in December of 1971 just as the pilot studies were being completed and learned some disappointing news. In spite of the recent success of the national smallpox eradication program that had been made possible in large part thanks to improved surveillance practices, international priority and support for surveillance, and recommendations made by Brazilian experts linked to the initial pilot studies, the NPCP would not include an active surveillance component. Instead, and much like the early stages of the CEV and polio initiatives in the early 1960s, the NPCP would only focus on mass immunization campaigns.29 This demonstrates a failure to learn from previous experience, a failure to integrate research conducted by domestic communities of experts into policy decisions, and a failure of the health system more broadly.

Inadequate priority for surveillance during the smallpox campaigns between 1966-1969 had been the source of significant conflict between Brazilian public health officials and WHO officials working on the campaign. Moreover, the inattention to surveillance became a major source of embarrassment for the Brazilian military regime at the end of the 1960s when it was revealed that vaccinators were reporting false data, and estimated that there were several thousand more smallpox cases in Brazil than were being reported. Additionally, surveillance was a key element of the policy recommendations made by PAHO’s Directing Council and Dr. Sabin in 1971, and consistently cited as one of the major constraints derailing immunization programs throughout the region. In spite of all of these factors, the Brazilian government opted not to include surveillance in the NPCP.

29 Ibid.
Ultimately, Dr. Risi cited the lack of epidemiological data as a key factor in explaining the limited progress made by and eventual abandonment of the NPCP. Without sufficient data there was no way to demonstrate that the program was actually reducing polio incidence and effectively combating polio. It was thus extremely difficult for public health officials to mobilize either community support for immunization activities or the resources needed to expand and sustain the program. Additionally, without any clear proof that the program was effective, the NPCP was vulnerable to administrative instability and changes in leadership within the Ministry of Health.

Technical Guidelines and Programmatic Norms

The lack of credible indicators and surveillance capacity was exacerbated by insufficient technical guidelines provided by the Brazilian Ministry of Health. All of these issues were indicators of the insufficient stewardship functions provided by the Ministry of Health as well as broader weaknesses in health system capacity. This was very similar to the experience with the initial polio immunization campaigns in the early 1960s.

When Brazilian officials first adopted the live oral polio vaccine in April of 1961, the Ministry of Health claimed it would assume responsibility for providing doses of the vaccine as well as technical guidelines that state officials could use to guide the implementation of their own immunization programs. However, as the Brazilian case study in chapter three demonstrated, the technical guidelines provided by the Ministry of Health were unclear, inconsistent with opinions of both domestic experts and external actors such as Albert Sabin, poorly articulated and communicated to subnational actors, and subject to change as the Ministry of Health saw fit without consulting or informing subnational actors affected by the changes.
Ten years later when the Ministry of Health adopted the NPCP, similar constraints emerged indicating that the stewardship functions of the central government and Ministry of Health had not changed during the past decade. According to Dr. Risi, the Brazilian Ministry of Health didn’t provide adequate technical guidelines for state and local authorities to follow. Also, due to the fact that there wasn’t an active surveillance component to the NPCP there was inadequate data available on polio incidence and distribution at national, state, and local levels. Insufficient data from the period leading up to the NPCP’s launch and during its lifespan made it extremely difficult to assess the nature of the implementation constraints that had derailed previous programs and that needed to be addressed in the planning of the NPCP.

For example, the 1971 pilot study carried out in Espirito Santo showed poor seroconversion rates among many previously vaccinated children. However, the data on vaccination histories was virtually nonexistent and the researchers had to rely on a mix of incomplete data collected by local health services and vaccination records for individual children provided by their families. As a result it was difficult to determine the actual cause of the low conversion rates. Vaccines that were insufficiently potent due to production issues or weaknesses in the cold chain used to transport vaccines from the production facilities to the vaccination sites would cause low seroconversion. However, low seroconversion could also be caused by a lack of adherence to technical guidelines including vaccination schedules and failure to complete the series of doses required to produce sufficient immunity. Either way, without accurate data or clear technical guidelines to refer back to it was difficult to determine either causes or possible solutions to weaknesses in the program.
Limited Scope and Pseudo-National Programs

Another factor that constrained the NPCP was its limited scope. This was a result of weak coordinating capacity of the central government, limited authority of the central government relative to states, and weak health system capacity at both national and subnational levels. The NPCP, like the polio immunization campaign ten years earlier, and smallpox campaigns launched during the same time period in the early 1960s, was national in name only. The initial polio campaigns in the early 1960s had been limited to state capitals where it was estimated that only roughly one-fifth of the Brazilian population resided as of 1960. Participation in the early 1960s program was entirely up to state health authorities and could in no way be enforced by the central government. In some ways the NPCP was even more limited. During the program’s two-year lifespan, only 14 states opted to participate in the program.\(^{30}\)

Similar to the previous polio campaigns starting in 1961, the NPCP was also limited in scope in terms of the population covered by the plan from its inception. The stated aim of the NPCP was to vaccinate 85% of the susceptible population, approximately 15.7 million children 3 months to 4 years of age, over a period of two years.\(^{31}\) The first stage of the program focused entirely on communities that had more than 2,000 people. At the time the NPCP was launched Brazilian public health officials estimated that only 6.5 million children lived in these communities.\(^{32}\) As a result, the NPCP’s first (and ultimately only) stage systematically excluded roughly 9 million susceptible children residing in areas not covered by the original plan. This proved to be extremely problematic.

\(^{30}\) This is similar to the smallpox campaigns launched in Brazil between 1958 and 1961 where only 18 of 26 states participated. See Hochman, "Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda," 242.

\(^{31}\) Brito Bastos et al., "Antipoliomyelitis Program in Brazil; a Serologic Study of Immunity Levels," 54.

\(^{32}\) Ibid.
In a study on polio in the State of Guanabara using data from the campaigns in the early 1960s, Brazilian microbiologist Dr. Hermann Schatzmayr and his colleagues found that variation in immunization strategies and access to immunization services in different but adjacent administrative divisions had negatively influenced program outcomes.\textsuperscript{33} Their study area had included large numbers of susceptible children who were living in the same area but who were covered by different health services based on the fact that the children officially resided in different administrative districts. As a result they had different access to immunization services. The authors argued that a coordinated vaccination program across administrative divisions (state and local) was required to interrupt the circulation of wild poliovirus.\textsuperscript{34} However these (and most other) findings were not integrated into the NPCP. Due to the limited stewardship capacity of the Ministry of Health and the traditional autonomy of state actors, the Ministry had very limited authority to coordinate actions across subnational units.

Ultimately, the limited scope of the NPCP in terms of population coverage, failure to scale the program up to include the entire country, and internal rural-urban migration during this period in Brazil meant that children from unvaccinated rural areas were increasingly arriving in urban centers. Another factor that exacerbated this situation was the rise of favelas (urban shantytowns) in Rio de Janeiro and other large urban centers during this period. Government housing policies (also known as “favela eradication” initiatives) during the 1960s and 1970s that focused on relocating low-income groups from “non-urbanized” parts of Guanabara to the “newly urbanized areas” on the edge of Rio de Janeiro City, contributed to a dramatic increase in the population of favelas without a concomitant increase in government services or resources to


\textsuperscript{34} Ibid.
these areas.\textsuperscript{35} A combination of hard-to-reach populations within urban centers who remained unvaccinated, increasing rural-urban migration, and inadequate vaccination of populations born in the intervals between mass campaigns, created large susceptible populations and ideal conditions for polio epidemics which were reported throughout Brazil during the remainder of the 1970s.

**Subnational Variation in Implementation Capacity**

Similar to the polio campaigns in the early 1960s, implementation of the NPCP was left almost entirely to state health authorities and relied heavily on each state’s institutional capacity and existing resources that could be mobilized to support the campaign. Participation in the program was optional and had to be pursued by state health authorities that were responsible for the administration and implementation of the program. State authorities were required to organize coordinating committees at state and local levels as well as provide strategic plans in order to ensure federal support, especially concerning vaccine supplies.\textsuperscript{36} Once state-level plans had been approved, the Federal Ministry of Health the Ministry would assume the responsibility for providing the required polio vaccine doses to state health officials at no cost and would also provide the general strategy to be followed in the states.\textsuperscript{37} However, the plan developed by the Ministry of Health did not account for the significant variations in subnational health system capacity throughout Brazil.

Most of the 14 adopting states were located in less developed regions of the country where resources and implementation capacity were similarly limited. As a result, the NPCP

\textsuperscript{35} Ibid., 212.
\textsuperscript{36} Risi Jr, "Poliomyelitis in Brazil," 164-65.
\textsuperscript{37} Ibid., 164.
tended to be operational in states that lacked the institutional capacity to fully implement the program or sustain it in the absence of significant federal resources. Moreover, the variation in capacity affected the extent to which the program was implemented according to the guidelines provided, and also determined the extent to which epidemiological and surveillance data were collected and reported about the program. It is important to note that the basic idea of centralized program development and oversight combined with subnational adaptation and implementation was conceptually sound and similar to the program executed in Cuba during the early 1960s. However, in the absence of stronger stewardship at the national level and greater health system capacity at subnational levels, the NPCP was unsuccessful and unsustainable.

Shifting Public Health Priorities and the Abandonment of the NPCP

In 1971 when the NPCP was first launched, mass immunization campaigns were viewed as a necessary part of a longer-term strategy for expanding immunization coverage that should not be discontinued until routine immunization services were proven to be effective for achieving and maintaining sufficiently high coverage levels. This was consistent with the emerging consensus within PAHO that a combination of strategies was required in most Latin American countries to effectively expand immunization coverage in the absence of stronger overall health system capacity. However, in 1973, the NPCP was folded into Brazil’s newly established National Immunization Program (NIP) as part of a reorientation of government health priorities and broader recentralization efforts under the Médici administration. The NIP was intended to integrate the various disease-specific initiatives into a broader program so that technical guidelines, immunization schedules, surveillance and other basic oversight issues, could be handled by the same administrative unit within the Ministry of Health. This was an important
development concerning strengthening the stewardship role of the Ministry of Health and the health system more broadly.

The first stage of the NIP began in late 1973 in Northeastern Brazil, however a change in leadership within the Ministry of Health in March of 1974, resulted in a change in strategy for the NIP and the total abandonment of the NPCP including mass immunization campaigns.\(^{38}\) In mid-March of 1974, Dr. Paulo de Almeida Machado replaced Dr. Mario Machado de Lemos as Minister of Health and brought with him a group of technocrats from the University of São Paulo to reorganize and reorient the Ministry of Health.

The new leadership within the Health Ministry didn’t support mass campaigns based on a belief that they would diminish demand for routine health services. Vaccination was argued to be a “very important tool for attracting people to regular visits at health centers, where they could get integrated attention to their health needs.”\(^ {39}\) However, there was one serious problem with the new strategy promoted by the Ministry of Health. While claiming to support routine visits to health centers, the military regime was simultaneously gutting the public health sector in favor of more costly, hospital-based, private, and curative care. Drastic cuts in funding for basic public health and primary care interventions contributed to an overall deterioration of the public health sector in Brazil and limited access to basic care. Ultimately, vaccination wasn’t likely to serve as a “very important tool” for attracting people to visit health centers if there weren’t health centers to visit in the first place.


\(^{39}\) Risi Jr, "Poliomyelitis in Brazil," 166.
Brazil Case Study Conclusion

During the early 1970s Brazil’s polio immunization campaigns were derailed by a number of constraints that had similarly derailed programs during the early 1960s. The stewardship functions provided by the Brazilian Ministry of Health were weak in a range of areas including policy development and evaluation, coordination with subnational actors, establishing national priorities and programmatic guidelines, and facilitating subnational policy adaptation and implementation. In short, the Ministry of Health didn’t provide real leadership within the health sector in Brazil during the early 1970s. Leadership instability within the Ministry and drastic cuts in its funding exacerbated the situation.

During this same period of time in the late 1960s and early 1970s the broader health system in Brazil was extremely weak in many ways and grew weaker throughout the 1970s as a result of the military’s efforts to privatize the health sector. The already overly curative-care focused health system became even more focused on curative and hospital based interventions during the 1970s while basic preventive interventions such as immunization services were neglected. As a result, preventive interventions were primarily left up to state-level actors and resources. Based on Brazil’s longstanding subnational inequality (discussed in chapter three as well as the previous case study) poorer states frequently lacked resources or the institutional capacity to implement preventive and basic primary care programs in the absence of federal funding.

The episode in the early 1970s surrounding the NPCP illustrated a significant failure to learn from previous domestic experiences, experiences that were not available to domestic policy makers during the first implementation episode in the early 1960s. In spite of the fact that Brazil had a strong domestic community of experts and a well-trained cadre of public health personnel by 1971, the closed nature of the Brazilian health policy subsystem limited the potential for...
policy learning. This was exacerbated by the antagonistic relationship between the Brazilian military regime and Brazil’s scientific communities (discussed in chapter three). As will be seen in the Brazilian case study in chapter six, domestic communities of experts had far greater access to the policy subsystem starting in late 1979. As a result, the post-1980 polio campaign was developed based on evaluations of previous campaigns and their successes and failures, with the Ministry of Health increasingly using evaluation as a driver of policy learning and change.

**Mexican Polio Initiatives, 1968-1974**

Between 1955 when the first polio vaccine was introduced to the public and adopted for use in Mexico and 1965, Mexico’s polio immunization campaigns were among the most effective in the region. Mexico’s progress continued to be noteworthy during the second half of the 1960s and early 1970s. In contrast to many other Latin American countries throughout the 1960s and early 1970s, where polio initiatives were sporadic and primarily launched in response to epidemics, Mexico’s polio policies were marked by gradual and incremental changes building on the successes and failures of previous efforts. However, in spite of performing better than many other Latin American countries during this period, Mexico’s progress flat-lined in the late 1960s only spiking temporarily in the early 1970s linked to the launch of intensive mass immunization campaigns to combat polio.

A series of assets and constraints explain the development of polio immunization initiatives in Mexico during the late 1960s and 1970s. These included the same basic factors that helped explain the comparative effectiveness of Mexico’s polio immunization efforts during the late 1950s and first half of the 1960s discussed in chapter three. Mexico had strong and stable
health sector leadership, a longstanding precedent of state intervention in public health and focus on prevention, the strongest domestic laboratory and vaccine production capacity in Latin America, well-trained domestic communities of experts linked to the policy process through overlapping personal and professional networks, and a health system with comparatively strong data collection, surveillance, and public health research capacity. An additional factor that influenced Mexican polio initiatives between 1968-1974, that was also consistent with previous adoption and implementation episodes discussed in chapter three, concerned Mexico’s proximity to the United States. The constant concern over disease transmission between the two countries and precedent of cross-national collaboration in health helped ensure that polio remained on the Mexican policy agenda.

Geoepidemiology and Priority for Polio in Mexico

Geoepidemiological factors, specifically, Mexico’s proximity to the United States, help explain the relatively continuous priority for polio in Mexico throughout the 1960s and 1970s. Once polio vaccines and state-sponsored polio immunization were introduced in Mexico starting in the second half of the 1950s, polio never truly disappeared from Mexico’s national agenda. Chapter three described the somewhat unexpected situation related to polio in Mexico and the United States in the pre-vaccine era in the 1940s and first half of the 1950s: Mexico was at far greater risk of imported polio cases from the United States than the other way around. However, the situation reversed itself during the 1960s. The United States made dramatic progress in controlling and preventing polio after the Salk and Sabin vaccines were introduced and used extensively throughout the entire country. By 1965, only 61 cases of polio were reported in the United States, down from a peak of 35,000 cases reported annually during the late 1940s and
early 1950s.\textsuperscript{40} As the total number of cases nationwide dwindled, greater attention was focused on the areas of the country still reporting polio, specifically, areas along the U.S.-Mexico border.

In July of 1966, the U.S. Centers for Disease Control (CDC) reported that, during the first six months of the year a total of 23 cases of polio had been reported in the United States. All but five of those cases were reported from Texas and mostly along the Rio Grande River in counties on or near the Mexican border.\textsuperscript{41} Based on this report, in a letter to former Minister of Health Dr. José Alvarez Amézquita, Dr. Albert Sabin expressed his concern that Mexican health authorities were not upholding their obligations to their neighbors to the North. In his August 1966 letter, Dr. Sabin suggested that a friendly communiqué might be in order to the new Minister of Health, reminding him that Mexico’s progress in combating polio (especially after the progress made under his predecessor) was not only of concern for Mexico, but also for the United States.\textsuperscript{42} While helping to ensure that polio stayed on the Mexican policy agenda, longstanding actor networks linking public health officials in both countries also increased cross-national collaboration and generated new information to inform policy decisions on both sides of the border.

**Incremental and Evidence-Based Scale Up**

In 1968 PAHO claimed that polio incidence in “Middle America” had declined more significantly than in other subregions, thanks primarily to “well-executed campaigns” in Cuba and Mexico.\textsuperscript{43} The Annual Report for the following year again singled Mexico out for its progress and noted that due to “financial and administrative difficulties,” no other Central

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\textsuperscript{40} Centers for Disease Control website accessed at: \url{http://www.cdc.gov/vaccines/vpd-vac/polio/dis-faqs.htm}
\textsuperscript{41} “23 Polio Cases Are Reported,” *Times Daily*, July 9, 1966
\textsuperscript{42} Letter from Albert Sabin to José Alvarez Amézquita, August 11, 1966. ABS Archives.
American country had been able to achieve similar success.\textsuperscript{44} In 1969 there was a significant increase in the number of cases reported in Costa Rica, Honduras, and Nicaragua. PAHO explained that this was due to sporadic immunization efforts in each country and a tendency for public health officials to immunize only in response to epidemics.\textsuperscript{45} This stood in contrast to the incremental but continuous progress made in Mexico, where polio immunization occurred year round and was frequently supplemented by more targeted mass immunization campaigns. The following section demonstrates how policy evaluation and the involvement of domestic communities of experts in the policy process facilitated policy learning that subsequently shaped Mexico’s more incremental and gradual progress in combating polio.

A key factor that helps explain the development of Mexican polio initiatives throughout the 1960s and 1970s (and up through the 1980s and 1990s discussed in chapter six) concerns the relative stability and continuity in programs and the extent to which previous domestic experiences influenced later policy developments. In contrast to Brazil where policy learning wasn’t significant until the third implementation episode in the 1980s discussed in chapter six, policy evaluation and policy learning were influential in Mexico throughout the 1960s and 1970s.

During the first half of the 1960s the focus of Mexico’s polio immunization efforts was to reduce morbidity and mortality levels linked to polio. This involved focusing on immunizing children under the age of three with supplementary efforts to immunize children under the age of five in cities with pre-existing sanitary units, and in rural areas experiencing polio outbreaks.\textsuperscript{46} Public health officials in Mexico during this period of time acknowledged the limitations of this

\textsuperscript{45} Ibid.
\textsuperscript{46} Vilchis Villasenor and Rodriguez, "Poliomyelitis Control in Mexico," 18.
approach, specifically that it largely excluded rural communities that were beyond the scope of existing immunization programs and un-served by regular health facilities.

In 1962 Mexican public health officials began collaborating with Dr. Albert Sabin on a series of studies in order to develop a plan for polio eradication in Mexico.\(^{47}\) The studies involved serological surveys of polio incidence in different parts of the country and focused on developing polio surveillance capacity. Based on the findings of these and other studies conducted during the first half of the 1960s, in 1967, officials within the Secretariat of Health developed a plan to intensify and expand existing polio efforts. In explaining the decision to switch from control to eradication strategies, the Secretariat of Health cited both previous domestic experiences and research conducted in Mexico, as well as the experiences of countries including Canada, the United States, the Soviet Union, Czechoslovakia and Cuba, as having demonstrated that polio eradication was feasible.\(^{48}\)

**Adaptive Capacity: Learning from Domestic Experience and External Models**

The shift from control to eradication was translated into formal health policy in 1968 with the launch of the National Plan to Eradicate Polio. Similar to previous campaigns, the post-1968 campaigns were rolled out in phases with different states integrated into the program during different phases. The objective was to integrate all 31 States plus the Federal District in three phases between the beginning of March 1968 and the end of 1969. There were three primary differences between pre-1968 and post-1968 campaigns that were linked to Mexico’s previous domestic experiences as well as experience in other countries, most notably, Cuba.

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\(^{48}\) Vilchis Villasenor and Rodriguez, "Poliomyelitis Control in Mexico," 18.
The first difference, and one that was related to Cuba’s experience that was cited by Mexican public health officials and promoted in Mexico by Dr. Albert Sabin, was the shift in the program’s objective. Whereas previous programs were focused on the more conservative objective of controlling polio, post-1968 polio efforts in Mexico had the ultimate goal of completely eradicating the disease. The direct influence that the Cuban polio model had on public health officials is cited in reports by Mexican public health officials, and is also visible in personal communications between Albert Sabin and his colleagues in Mexico. In fact, when Dr. Sabin traveled to Cuba in December of 1967 and got the opportunity to evaluate the Cuban polio model, he stopped in Mexico for several days on both ends of his trip to meet with Mexican researchers, traveling to Cuba by way of Mexico and with the collaboration of Mexican public health officials, including Mexico’s Minister of Health, Dr. Rafael Moreno Valle.

The salience and appeal of the Cuban polio model to Mexican public health officials was understandable for a number of reasons based on the core elements of the Cuban model (discussed in chapter three) and several basic features the two countries had in common. One element of the Cuban polio model was the clearly established stewardship role and authority of the central government. This was essential for developing, coordinating, and executing a nationwide campaign. A second element was the combination of centralized program development and oversight with decentralized implementation. Third, the Cuban campaign relied on mass public health education programs and the mobilization of volunteers to bring vaccines house-to-house in areas lacking access to regular health facilities. This made it possible to cover the entire population in the absence of stronger basic health system infrastructure. All of these core elements of the Cuban campaign were compatible with existing conditions in Mexico during the late 1960s.
Mexico had strong administrative capacity and central government institutions making it possible to develop a truly national campaign with realistic expectations of compliance from subnational actors. Mexico also had pre-existing and institutionalized mechanisms for coordinating actions between national and subnational health authorities. As a result, Mexican public health officials could use preexisting mechanisms and institutions as a foundation for establishing subnational coordinating bodies linked to the campaign as had been done in Cuba. Mexico similarly had a strong domestic public health precedent of state-led public health education, large-scale population mobilization to support public health initiatives, and the use of volunteers in health campaigns.\(^49\) Lastly, the use of mobile brigades to reach communities without access to regular health services and facilities was entirely compatible with existing capacity constraints recognized by Mexican public health officials during the 1960s. In short, in many ways the Cuban polio model was highly compatible with domestic conditions (both resources and constraints) in Mexico. Learning from external models was complemented by information generated from domestic sources.

Several additional differences between pre and post-1968 polio campaigns were based on evaluations of previous domestic experiences in Mexico. Polio immunization efforts prior to 1968 had been focused primarily on vaccinating children under the age of three in urban areas and in rural areas to combat epidemics. Data cited and produced by Mexican public health officials and researchers demonstrated that the disease distribution of polio had changed significantly since polio vaccines were first introduced in 1955. The availability of surveillance data on polio extending back to 1937 made it possible to clearly identify these trends. Prior to the

\(^{49}\) These precedents can be seen in Marcos Cueto’s work on malaria eradication in Mexico and will be discussed in chapter six.
early 1960s, the majority of polio cases in Mexico were reported in urban centers, especially the Federal District.\textsuperscript{50}

This was consistent with the urban-rural distribution of polio reported throughout the Americas during this time period and had to do with a combination of improved sanitation services in urban areas that prevented the natural circulation of polioviruses and naturally acquired immunity, more readily available access to polio immunization at health centers and through mass campaigns, and better disease surveillance reporting in urban areas. The proportion of cases reported in urban versus rural areas in Mexico shifted dramatically throughout the 1950s and early 1960s. For example, in 1951 of the 1,834 cases reported, 56.9\% were reported in the Federal District, whereas by 1968 only 3.9\% of the total 850 cases were similarly concentrated.\textsuperscript{51} The change in distribution, combined with rural-urban migration, created new implementation challenges for Mexican public health officials.

In 1960 it was estimated that 46\% of the Mexican population resided in rural areas. However, by the end of the 1960s the rural population had decreased to just over 38\%.\textsuperscript{52} This rural-urban migration was compounded by the high birth rates in both urban and rural areas alike. Families with unvaccinated children migrating from rural to urban areas, combined with new cohorts of young children that were born in urban areas between mass immunization campaigns and not reached by routine immunization services conducted in the intervals between mass campaigns, created the optimal conditions for polio outbreaks.\textsuperscript{53} This convergence of factors placed additional importance on reaching both the smaller and harder to reach “sending

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\textsuperscript{50} Vilchis Villasenor and Rodriguez, "Poliomyelitis Control in Mexico," 18.
\textsuperscript{51} Ibid.
\textsuperscript{52} (PAHO), "Health Conditions in the Americas, 1965-1968," 3.
\textsuperscript{53} This issue of susceptible pockets reemerged in the late 1980s surrounding a measles outbreak among rural populations and promoted the establishment of Mexico Universal Vaccination Program in 1991 with the concept of “immunological equity” as the Program’s foundation.
communities” where migrants originated, and also those “receiving communities” or birth cohorts born in urban areas in the intervals between mass immunization campaigns.

As a result of these challenges, Mexican public health officials had to develop a more flexible and dynamic immunization program that included different strategies designed to reach different populations, including previously un-reached populations. The integration of new strategies to extend vaccination coverage was another key difference between pre and post-1968 initiatives and demonstrated the increased adaptive capacity of the Mexican health system during this period. The need for new strategies was based on Mexico’s existing health system capacity and the limited access of rural populations.

Health System Capacity: Reaching the Hard-to-Reach

The intensified polio program in 1968 and 1969 added the use of mobile vaccination teams on to the previous immunization program in an effort to bring vaccines into small and hard-to-reach communities, specifically, communities of 100 people or larger. The house-to-house strategy had been developed and demonstrated very effectively in Cuban polio campaigns starting in 1962, and had provided an effective way to expand vaccination coverage to communities without access to regular health facilities.\(^{54}\) This represented a dramatic expansion of previous immunization efforts in Mexico.

Mexican public health officials explained the decision to focus on communities with 100 people or more based on both epidemiological and administrative grounds. From an epidemiological perspective, excluding children under the age of five living in these small communities that were off the regular routes of immunization brigades and beyond the scope of

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\(^{54}\) When Cuban polio campaigns were first launched in 1962, Cuba’s rural health services were still under development and as a result many rural areas still lacked access to permanent health facilities. Mobile brigades provided an interim strategy to ensure maximum coverage prior to the development of more extensive infrastructure for health.
existing services, wasn’t overly significant since the actual number of people residing in communities of this size (fewer than 100 people) represented just over 5.3% of the total population of Mexico in the late 1960s.\textsuperscript{55} In theory, it was entirely possible to achieve the targeted minimum 80% immunization coverage recommended by Dr. Sabin and other experts even if these smaller communities were not covered.

From an administrative and monetary perspective, excluding these smaller communities significantly decreased the overall costs and administrative requirements of the program. While communities of 100 people or fewer only represented 5.31% of the total population of Mexico during the late 1960s, they accounted for 38.5% of all localities in Mexico at the time.\textsuperscript{56} Sending mobile teams to conduct house-to-house vaccinations in these localities, as Cuba had done during the early 1960s, would have been unrealistic and inefficient due to the territory that would need to be covered and the distribution of the total population in Mexico. Beyond having a population that was roughly five times larger than the population of Cuba during the 1960s, with a total area of roughly 2 million square miles, Mexican public health officials would also have had to cover a territory roughly 46 times larger than Cuba’s.

The campaigns in the late 1960s also demonstrated increased coordination between national and subnational actors and increased local level program adaptation that was facilitated by public health officials from the different agencies within the Secretariat of Health. Federal health officials were posted in each state and larger localities during the initial phases of the program. These officials were charged with working with state and local actors to adjust programs to better suit local conditions, establish appropriate vaccination schedules and campaign timelines, and participate in training, advising, and supervising local staff linked to the

\textsuperscript{55} Vilchis Villasenor and Rodriguez, "Poliomyelitis Control in Mexico," 20.
\textsuperscript{56} Ibid.
program. State and local health officials were similarly involved in program supervision. Additionally, local communities were also actively involved in the campaigns, working as volunteer vaccinators and providing transportation for public health officials and vaccine supplies.

Building on the progress made during the 1968-1969 polio campaigns, and in the aftermath of the September 1971 PAHO Directing Council consultation with Dr. Sabin, Mexican public health officials, accelerated nationwide mass immunization campaigns. In spite of significant improvements over pre-1968 efforts, the 1968-1969 campaigns had been less successful than hoped. One of the explanations that Mexican public health officials provided was the more incremental scale-up of the program that was intended to incorporate every state in the country over a period of 12 months. Mexican officials determined that scaling the program up in phases had not made the most effective use of federal resources, as it had required constant coordination by federal officials throughout the entire 12-month scale-up period. At the Directing Council meeting, Dr. Sabin had proposed nationwide mass campaigns coordinated throughout the entire country at the same time (like the Cuban model), as a way to make more efficient use of government resources.

In early February of 1972, Mexican health officials launched nationwide mass immunization campaigns with the objective of conducting campaigns throughout the entire country simultaneously. The results after the first year were impressive. It was reported that in 1972, mass campaigns succeeded in immunizing 70% of children under the age of five with three doses of the trivalent vaccine spaced two months apart. Coverage rates were even higher in states along the U.S.-Mexico border with 94.7% coverage with the first dose and an

57 Ibid., 21.
unprecedented 85% of children receiving the recommended three doses.\textsuperscript{59} The higher coverage along the border was an example of the continued geoepidemiological effects generated by Mexico’s proximity to the United States. As a result of the coverage levels achieved during the mass campaigns, Mexico reported a significant decline in polio incidence in 1973 and 1974. Whereas during the previous five-year period the average number of cases reported annually was roughly 900, in 1973 and 1974 cases dropped to 221 and 231 respectively.\textsuperscript{60}

Health System Constraints and Shifting Strategies

In spite of the impressive progress made in expanding coverage during the intensified polio campaigns during the late 1960s and early 1970s, a major issue remained unsolved: 30% of the target population was still not consistently being reached by immunization programs in Mexico. An additional problem was that, beyond the intensive phases of the program, maintaining immunization coverage levels and vaccinating children born after the intensive phases had been completed, were left up to state and local authorities and state and local health systems. While the initial phases of the Mexican campaigns in 1968-1969 and 1972-1973 had effectively reached large numbers of previously unreached populations, there weren’t sufficient maintenance programs in these same areas to sustain immunization coverage rates beyond the intensive phases of the campaigns when mass immunizations and mobile brigades were used.

Official reports from the Mexican Secretariat of Health in the late 1960s noted that in rural areas, existing health facilities had only been able to vaccinate between 20-30% of infants born after the completion of the intensive phases as of 1970.\textsuperscript{61} According to PAHO’s \textit{Annual

\textsuperscript{60} \textit{"Mass Vaccination against Poliomyelitis in Mexico,"} S397.
\textsuperscript{61} Vilchis Villasenor and Rodriguez, "Poliomyelitis Control in Mexico," 24.
Report for 1970 the inadequate follow up through regular and permanent immunization services helped explain the distribution of polio cases reported during the year that were concentrated primarily in areas where only the vertical mass campaign strategy was used.\textsuperscript{62} Essentially, polio outbreaks occurred where there wasn’t any sort of regular access to permanent health services and where special strategies such as mobile brigades had been used more or less exclusively as a result. A similar trend was reported with the mass campaigns carried out in the early 1970s as well. In short, the polio campaigns in the late 1960s and early 1970s highlighted what Mexican public health officials already knew: Mexico’s health system wasn’t reaching large segments of the Mexican population.

During the early 1970s, addressing the weaknesses in Mexico’s health system related to health services in rural areas became a high priority for the Mexican government and public health leadership. Major rural health development initiatives were launched in the early 1970s that focused on expanding the number of basic health facilities in rural areas and increasing state and local health system capacity. As part of these broader initiatives, emphasis was placed on more integrated and comprehensive strategies for improving population health. Accordingly, in 1974, mass immunization campaigns were folded into a national immunization program that covered a range of vaccine preventable diseases, including but not limited to polio. Mass campaigns and more intensified strategies were still used to target hard-to-reach populations, for example, the urban poor in Mexico City, and in response to potential outbreaks, however they were no longer a central component of Mexico’s overarching immunization program.

The development of routine immunization services was promoted along with the development of other primary health care services. The shift in domestic priorities in Mexico was in line with broader shifts within the regional and international health communities and the

\textsuperscript{62} \textit{Annual Report of the Director, 1970,"} 30.
adoption of the Expanded Program on Immunization (EPI) within the WHO in 1974. Within PAHO, the shift was clearly articulated in the Ten-Year Health Plan for the Americas established by Member Nations in 1972 that emphasized the need for expanded routine immunization services as part of the more general objective outlined in the Plan to extend more comprehensive health services to populations of less than 2,000 people.63

Mexico Case Study Conclusion

Polio vaccination in Mexico increased gradually after the Salk vaccine first became available in 1955 and then expanded more dramatically starting in the early 1960s once public health officials began a more intensive nationwide immunization campaign using both inactive and live polio vaccines. Throughout the 1960s, no other country in Latin America had a similarly dramatic and consistent increase in and expansion of polio vaccination during the 1960s with the exceptions of Cuba and Uruguay. In most Latin American countries during the 1960s and first half of the 1970s, polio immunization was conducted sporadically and primarily in response to outbreaks.

The pattern in Mexico was more or less consistent and characterized by more gradual, incremental, and sustained progress. Immunization coverage expanded consistently between 1955 and 1975, with peaks in coverage associated with mass campaigns or intensified initiatives. After each intensified immunization episode the base-line level of immunization coverage was higher than it had been prior to the spike.64 Additionally, surveillance data from Mexico

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demonstrates that vaccination programs starting in the second half of the 1950s, were regularly adapted and improved upon throughout the 1960s and 1970s, evidenced by corresponding decreases in polio incidence during this period of time. In contrast to the situation in Mexico, visible trends are difficult to identify in many other countries in Latin America during this period of time based on inadequacies in surveillance data and weak or non-existent program evaluations.

The causal explanation behind Mexico’s comparatively effective immunization programs can be summarized as follows. First, geoepidemiological factors, specifically Mexico’s proximity to and collaboration with the United States, helped keep polio on Mexico’s national health agenda dating back to the late 1940s. No other country in Latin America had the same geoepidemiological influences related to polio. During the 1940s and 1950s, the United States reported more polio cases than all the countries in Latin America combined (this is after accounting for weaknesses in surveillance capacity and under-reporting in Latin America). As a result, having 2,000 miles of shared borders with the United States placed Mexico at greater risk for polio imports than any other country in Latin America. The situation reversed itself during the 1960s, however this did not change priority for polio in Mexico. The fact that the few remaining polio cases reported in the United States in the late 1960s and early 1970s were concentrated along the U.S.-Mexico border helped ensure polio’s place on the Mexican health agenda.

Second, Mexican public health precedent was an asset for immunization programs. As discussed in chapter three, there were strong precedents of state-intervention in public health, the authority of the federal government relative to subnational units, an emphasis on public health education and prevention, a history of mass public health campaigns and community
participation, existing vaccination legislation that could be used to justify interventions, and a broad popular acceptance of government-sponsored immunization programs. Additionally, public health officials in Mexico drew on more recent precedents established by polio immunization initiatives launched in the late 1950s and early 1960s to support campaigns in the late 1960s and early 1960s. For example, vaccination legislation requiring polio immunization for infants passed in 1963 during the first implementation episode provided additional support for post-1968 immunization programs.

Third, the stewardship of the central government and stewardship functions provided by the Federal Health Secretariat in Mexico also positively influenced immunization campaigns. According to Mexico’s Sanitary Codes the Federal Government and Secretariat of Health were the “supreme authorities” on matters of disease prevention and control throughout the entire country. State and local authorities were required to collaborate with national authorities and support national health priorities such as immunization campaigns. In each state, a federal health authority was appointed based on an agreement between national and state-level authorities, who served as a Minister of Health at the state level. Thanks to the authority of the central government and Mexico’s one party system under the Institutional Revolutionary Party (PRI), each state-level Minister of Health was essentially a political appointee of the Federal Minister of Health and the President.

The stability and continuity of leadership within the health sector at the national level also influenced the capacity of the Secretariat of Health. The leadership team within the Secretariat of Health during the 1970s was similarly strong and interconnected. Dr. Jorge Jiménez Cantu was appointed Minister of Health in 1970. Jiménez Cantu served as Secretary General of Government of the State of Mexico under Governor Gustavo Baz (a former Minister
of Health and one of Mexico’s most celebrated public health leaders of the 20th century) and also as director of a rural health program (CONASUPO) prior to assuming his position at the Secretariat of Health in 1970. He remained in his position until 1975 when he was tapped as the PRI’s gubernatorial candidate for the State of Mexico pursuant to the 1976 elections. In 1970 Dr. Carlos Campillo Sainz left his position as the Director of the Laboratory of Virology of the Secretariat of Health and Welfare (where he oversaw polio vaccine research) to join the Secretariat as Vice-Minister of Health. Campillo stayed in his position at the Secretariat of Health until 1976.

Mexico’s political and administrative stability was highly unusual in the region during the 1960s and 1970s. While other countries were dealing with military coups, civil wars, and significant political instability, Mexico stood out for its predictability and the continuity of leadership within the government.

Fourth, Mexico had strong domestic communities of experts and health researchers who were consistently and increasingly integrated into the health policy process during the 1960s and 1970s. A highly trained cadre of public health personnel and large domestic community of experts with access to the policy process increased Mexico’s capacity for policy learning. The evolution of Mexican polio initiatives during the 1960s and early 1970s demonstrates that domestic actors included program evaluation and operational research in programs early on and used information generated by evaluations and domestic research to adjust programs over time. Additionally, the post-1968 episode demonstrates that domestic actors effectively evaluated and adapted external policy models (as in the case of the Cuban polio model), to better suit domestic

66 In 1965 Campillo was awarded a U.S. Department of Health award for his work on polio. From ibid., 106-07.
conditions. Policy evaluation, operational research, and collaboration between public health officials and researchers, were significant elements of Mexican polio campaigns. They were also unparalleled in other countries in Latin America during this time period thanks in large part to Mexico’s highly atypical stability and continuity of public health leadership and would become even more essential to polio and immunization initiatives in Mexico during the 1980s as discussed in chapter six.

Fifth, in spite of the health system capacity weaknesses cited in this case study as having constrained greater progress in Mexican polio campaigns, Mexico’s health system was still comparatively strong in a number of important ways that were essential for immunization programs. At the start of the second implementation episode discussed in this chapter starting in the second half of the 1960s, Mexico already had stronger domestic public health laboratory capacity than any other country in Latin America. Mexico’s domestic laboratory capacity increased dramatically throughout the 1960s with public health laboratories jumping from 136 in 1960, to a striking 780 by the second half of the 1960s. Mexico also had stronger vaccine production capacity related to polio vaccines than any other country in Latin America going back to 1955 when the Salk vaccine was first introduced. By the end of the 1960s Mexico was still the only country in Latin America with the domestic capacity and facilities required to produce the live oral polio vaccine, and as a result, in 1968 the Government of Mexico and PAHO signed a collaborative agreement with the objective of using Mexico as an OPV producer for the entire region.

Another strength within the Mexican health system, again in spite of the previously stated limitations, concerned the availability and utilization of credible indicators. In spite of the weaknesses in the data, by 1968 when Mexican officials scaled up immunization initiatives, 67 "Summary of Health Conditions in the Americas, 1961-1964," 91.
there was readily available surveillance data on polio nationwide covering a thirty-year period. Once polio became a notifiable disease in Mexico in 1937, data on polio incidence and distribution were collected by federal and state health authorities on a routine basis. Although the data was limited by the limited scope of the health system, especially in rural areas, public health officials had a comparatively significant amount of data on polio throughout the country, that could be used to develop and evaluate polio interventions.

In sum, the basic approach used by Mexican public health officials throughout the 1960s and early 1970s (national programs developed using existing evidence and consistently evaluated and adapted over time, that were directed and funded by the federal government and coordinated with subnational actors who assisted with program implementation) worked in many ways, it just didn’t work well enough. While all of the factors helping explain success in Mexico in chapter three were similarly present in the late 1960s and 1970s, as new implementation challenges arose, it became clear that those factors were necessary, but not sufficient to effectively control, let alone eliminate, polio.

Polio persisted in Mexico throughout the remainder of the 1970s with peaks in 1975, 1977, and 1979. Although outbreaks reported during peak years were much less severe than those reported during the 1960s, highlighting the improvements made in polio immunization in Mexico, the continued presence of polio in epidemic form demonstrated persistent domestic capacity limitations, most specifically the failure of routine immunization services (and by proxy basic preventive health services) to reach the entire population. In the late 1970s and early 1980s, a series of comprehensive health sector reforms were launched by the Mexican government with objective of addressing the issues as will be seen in chapter six.
Cross-National Comparisons

Stewardship and Health System Capacity

There are several key aspects of stewardship and health system capacity where Brazil and Mexico varied significantly during the late 1960s and early 1970s that directly influenced immunization programs. First, while Mexico had a comparatively strong tradition of epidemiological surveillance prior to the adoption of polio vaccine in the 1950s, Brazil’s domestic surveillance capacity was arguably the worst in the region throughout the 1950s and up through the 1960s. At the start of the second implementation episode in Mexico in 1968, Mexican public health officials had national surveillance data on polio dating back to 1937, the year when polio became a notifiable disease in Mexico. Data, although limited to populations with basic access health facilities, was collected nationwide and on a consistent basis enabling the identification of trends in disease distribution, the more effective design of preventive interventions, and a basic assessment of program impact.

In contrast, Brazil’s surveillance system throughout the 1950s only covered roughly 11% of the entire population and was restricted to select state capitals. Polio did not become a notifiable disease in Brazil until 1968, seven years after the first nationwide polio initiative was first launched in 1961. As a result Brazilian policy makers essentially planned their programs blindly. Other than rather obvious impact indicators such as polio epidemics, officials had no way to evaluate whether or not programs were effective.
Second, the stewardship functions and capacity of the central government and Ministry of health in Brazil were weak and poorly articulated. Brazilian immunization programs did not include any sort of clear overarching programmatic guidelines established by the Ministry of Health or monitoring or evaluation mechanisms. Guidelines were poorly articulated, inconsistent, and subject to change without notice or justification. Without clear guidelines or even basic immunization schedules, there was no way to monitor or evaluate subnational program implementation or adjust strategies to better suit local conditions. In contrast, the stewardship role of the central government was clearly outlined in Mexico and Mexico’s Secretariat of Health provided important stewardship functions including clear programmatic guidelines for subnational actors. Monitoring and evaluation mechanisms were also included in programs early on and provided an essential source of information that policy makers used to adjust programs over time.

Third, throughout the late 1960s and 1970s Mexico and Brazil went in opposite directions concerning the balance of public and private sector health system development and support as well as the emphasis placed on preventive versus curative care in each country. During this period, Mexico increasingly turned away from contracting out health services to the private sector and actively expanded the public health sector emphasizing preventive care and community participation in public health. In contrast, the period starting in the early 1970s in Brazil witnessed a dramatic expansion of the private sector and exponential increase in the use of contracts provided by the Brazilian government to private health providers through Brazil’s social security schemes. This was significant for preventive interventions and basic health care such as immunizations that are viewed by many contemporary health policy scholars as “public
goods.” As the Mexican government was gradually assuming a greater role in the provision of care, the Brazilian government was rapidly assuming less.

Ultimately, Brazil developed Latin America’s largest welfare state providing formal social insurance to the masses without providing basic primary healthcare services or expanding the actual basic health facilities that would have facilitated greater access. So while health insurance coverage expanded dramatically there was no similarly dramatic improvement in basic health outcomes such as infant mortality or deaths from infectious diseases.68 Mexico, in contrast, expanded access to services through broader and more integrated programs that focused on actually providing basic health care services through the development of community health care facilities and rural development initiatives starting in 1972. Within these programs was an institutionalized mechanism to generate community participation in health as a requirement to receive government assistance. The focus in Mexico was more heavily on preventative care and public health education whereas in Brazil, an expensive, curative, and hospital-based system was consolidated.69 The legacies of the developments in the 1970s influenced subsequent program development in both countries in the 1980s as will be seen in chapter six.

Domestic Communities of Experts, Health Research, and Policy Learning

Brazil and Mexico stand out in the Americas as two of the countries with the longest biomedical research traditions and oldest institutions. Leading researchers in both countries were Rockefeller and Guggenheim Foundation fellows, they developed distinguished reputations in the laboratories of the Pasteur Institute and the Rockefeller Institute of Medicine, and they studied under founding fathers in the field of immunology and alongside Nobel Prize winners. And then,

69 Ibid.
by and large, they returned home to establish their own laboratories and, ideally, to contribute to the development of medical research capacity in their own countries. Thomas Glick writes that the Rockefeller Foundation sought out “young Turks” whose training the Foundation could support and who would subsequently return home and promote “institutional reform” in research and training institutions in Latin America.

By the mid-1960s immunology laboratory and research capacity in both countries was sufficiently advanced so that when the WHO sought to establish regional immunology research and training centers in different WHO regions, Brazil and Mexico were the two countries proposed to house the prominent centers for the region of the Americas. While both countries developed strong and well-established domestic communities of experts and research capabilities, the similarities ended there. The extent to which strong communities of experts influenced policy development in the two countries was largely shaped by administrative stability, collaborations between researchers and policymakers, and the access that domestic communities of experts had to the policy process.

The history of science and medical research in Brazil has been compared to the mythological tale of the ancient Greek King Sisyphus. Simon Schwartzman writes, “Cursed by the gods, Sisyphus was condemned to carry a large stone uphill, only to watch it roll back down, and start all over again.” According to Schwartzman this is a “proper metaphor” to describe the

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70 A common condition placed on Rockefeller and Kellogg Foundation fellows (and also PAHO fellows) from other countries was that upon completion of their award tenure, fellows were expected to return to their own countries to help train other researchers and develop their own laboratories and research programs. These laboratories and research institutions were often generously funded by the same institutions that awarded the original fellowships, especially in the case of the Rockefeller and Kellogg Foundations, as an incentive for domestic actors to remain in their home countries and help develop domestic capacity. This sort of trickle-down-training was a fundamental aspect of the Rockefeller Foundation’s work in the Americas between the 1930s and 1960s.

71 Glick, “Science and Society in Twentieth Century Latin America,” 480.
history of science in Brazil, “where successes have been few and ephemeral but persistence and enthusiasm have always been present.”

During the 1960s PAHO reports cited inadequate capacity building and domestic support for medical research with a tendency to focus on prominent individuals rather than on institutions, as a major limiting factor in Brazil. High levels of political and administrative instability in the years immediately before and after the military coup in 1964 (discussed in the previous chapter) similarly disrupted progress. The political transition under the military regime resulted in the “reorganization” of many existing institutions and exile of many leading scientists. The consequences of the volatile political context were seen immediately after the coup in 1964 when the work of Brazil’s main enterovirus laboratory at the Oswaldo Cruz Institute was disrupted in the midst of the polio immunization campaigns. Similar disruptions at the Oswaldo Cruz Institute took place in 1970 during the so-called “massacre at Manguinhos,” whereby ten prominent researchers at the Institute were fired and collaborative research projects with other institutions (both Brazilian and foreign) were shut down.

In general, the political situation in Brazil during the second half of the 1960s and first half of the 1970s destroyed the prospects for effective collaboration between researchers and public health officials. One never knew whether either the public health official or the researcher would remain in his position long enough to justify significant investment in collaborative research or when the next internal political shift would derail existing efforts. Additionally, the military regime (especially during the first decade) did not consult with or listen to the scientific community as a rule and communities of experts and researchers lacked access to the policy.

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73 See for example (ACMR), "Immunology in Latin America: A Survey."
74 Schwartzman, A Space for Science: The Development of the Scientific Community in Brazil 4-5.
process in Brazil. Accordingly, there is little evidence that the research conducted in Brazil
during this period of time influenced public policy formation in any significant way. Public
policies linked to the National Polio Control Program starting in 1971 bore no resemblance to the
evidence produced by Brazilian researchers outlining the failures of previous immunization
efforts and proposing possible solutions.

If Brazil was one of the many Latin American poster-children for the destructive
relationship between political instability and domestic capacity development, Mexico was the
counterfactual. A 1965 PAHO report states that the “general political stability” in Mexico during
the past 40 years “is reflected in the stability of many institutions - including universities and
research institutions.”76 In contrast to Brazil, and many other countries in Latin America during
the 1960s and 1970s, Mexico remained a positive deviant with no unexpected turnovers within
the leadership at the Ministry of Health, steady and consistent institutional capacity development
in the areas of medical research and training, and increasing emphasis placed on collaboration
between researchers and policymakers. In contrast to the situation in Brazil during the 1960s and
first half of the 1970s, Mexican communities of experts had early access to the policy process
with researchers and public health officials frequently connected to one another through
overlapping personal and professional networks. Mexico’s polio implementation episodes in
both the 1960s and early 1970s were characterized by effective policy learning and gradually
improved over time as a result.

Authority and Responsibility: Central Governments as Health Sector Stewards

The starkest contrast between Brazil and Mexico as relates to the issue of public health policy implementation during the 1960s and first half of the 1970s, concerns the authority, capacity, and responsibility of the central government relative to subnational units in the two countries. The responsibility and authority of the central government and Ministry of Health are directly related to stewardship. In many ways Mexico and Brazil reside on opposite ends of a federalist spectrum concerning their respective powers and responsibilities relative to subnational actors on a broad range of issues, including, but not limited to, matters of public health.

The Brazilian Federal Government had no constitutionally explicated overarching authority or responsibility for public health nationwide and assumed responsibility for and power over only those diseases and issues deemed to be of utmost national importance. Moreover, these diseases and issues weren’t clearly or consistently defined and were subject to change based on changes in leadership and changing priorities of the national government.\textsuperscript{77}

In contrast, the Federal Government in Mexico was the constitutionally appointed steward of the population’s health and assumed responsibility for the vast majority of issues related to disease prevention and control and basic public health throughout the entire country. The Federal Government in Mexico consistently viewed any and all communicable diseases as the responsibility of the Federal Secretariat of Health with state and local authorities expected to actively support national health programs and priorities. As a result, when polio campaigns were launched in Mexico whether in the 1950s or throughout the 1960s or early 1970s, they were launched under the auspices of the Federal Government and also with its resources and according to its regulations. The limitations in the Mexican immunization efforts in the mid-1970s were primarily based on the limited health system capacity concerning implementation and the

\textsuperscript{77} Constitutions were passed in 1934, 1937, 1946, and 1967. The current Constitution was drafted in 1988.
difficulty in extending and maintaining health coverage in Mexico’s sparsely populated rural areas.

Brazil’s polio immunization initiatives during the 1960s and 1970s were national in name only. At its peak, Brazil’s National Polio Control Program never included more than 14 out of Brazil’s 27 states. The Federal Government had no authority to require other states to adopt the program or to monitor or intervene in subnational program implementation. The limited authority, responsibility, and capacity of the central government constrained federal involvement to providing the vaccine to participating state programs and establishing broad (and not enforceable) national guidelines. This was consistent across campaigns in the early 1960s and early 1970s regardless of the type of government in power.

Regional Conclusion

The period between 1959-1974 was a period of tensions within PAHO and within Member Nations, between ideals and institutions. Priority was given to decentralizing the work of the Organization starting in the late 1950s, however in many areas, including but not limited to immunization, PAHO’s work was arguably overly decentralized without adequately developed centralized functions concerning the technical cooperation provided to Member Nations. For example, PAHO’s polio-related work during the early 1960s was uncoordinated, inconsistent, and provided primarily in response to emergencies. It reflected domestic constraints rather than helping domestic actors develop the capacity required to overcome them.

In general, PAHO’s centralized functions related to immunization programs and technical cooperation provided to Member Nations on issues of immunization were weak and poorly institutionalized throughout the 1960s and first half of the 1970s. Neither PAHO’s centralized
functions nor the domestic implementation capacity of Member Nations was sufficient to facilitate the development, implementation, and institutionalization, of more effective immunization programs throughout the region. Similar issues were present within countries throughout the region as well.

Most countries in Latin America had similar basic health system constraints that Mexico and Brazil had during the 1960s and 1970s. Health systems in most countries in the region were constrained by a combination of two key issues: weak stewardship functions and capacity of central government and national Ministries of Health and weak subnational implementation capacity. Key stewardship functions where Ministries of Health were typically weak included: policy planning, evaluation, and regulation; the establishment of overarching programmatic norms to guide subnational program development; facilitating subnational capacity development through technical cooperation; coordinating actions and resources of national and subnational authorities; establishing national priorities, long-term planning objectives, and financing mechanisms. Weak stewardship within Ministries of Health in terms of the provision of centralized functions to subnational units constrained the expansion and sustainability of immunization initiatives in countries throughout the region in the late 1960s and 1970s, including the more successful countries such as Cuba and Mexico.

Immunization programs throughout the region were also constrained by weak subnational implementation capacity and the limited coverage of health services in rural areas or among the urban poor. Local level health authorities frequently lacked resources, training, experience, and support from state and national authorities required to effectively implement even the most basic public health programs. Additionally, subnational actors and institutions lacked adaptive capacity required to more effectively adapt programs to better suit local conditions and the needs of local
communities. As a result, in cases where national health ministries did provide basic programmatic guidelines for national immunization efforts, programs were often adopted without attention to local conditions that might influence the implementation process.

Due to these basic health system constraints, by the mid-1970s PAHO reported that 120 million people in the Americas lacked basic access to health care. Reaching these medically indigent people would require significant changes in both ideologies and institutions within PAHO’s Member Nations as well as the Organization itself. These 120 million people as well the significant changes required to reach them, became PAHO’s primary focus under the leadership of Dr. Héctor Acuña who replaced Abraham Horwitz as PAHO Director at the end of 1974.
CHAPTER 5
THE EXPANDED PROGRAM ON IMMUNIZATION AND THE EMERGENCE OF A POSSIBLE HYBRID DIFFUSION SYSTEM

“On the one hand, the Member Governments no longer acquiesced in the old concept of the consultant from the developed country who, after analyzing the situation, made a diagnosis and proposed a solution. The consultant now had to be someone who had lived and felt the problems of the developing countries, as did 75 per cent of the staff of PAHO, who came from countries in that stage of development. The consultant needs to join forces with national experts and to work with them as another member of the working team.”

--PAHO Director Héctor Acuña speaking on the shift from “technical assistance” to “technical cooperation” in front of PAHO’s Advisory Committee on Medical Research (ACMR) in July of 1977

Dr. Ciro de Quadros arrived in Washington, DC, from Geneva on a Saturday evening in February of 1977. As a result of the energy crisis during the Carter Administration, even Washington’s famous monuments were dark, “like a ghost town.” De Quadros checked into a hotel across the street from PAHO and found a note telling him to call Karl Western, the Chief of PAHO’s Communicable Disease Division and De Quadros’ new boss, whenever he got in. In spite of the fact that it was late on a Saturday night, Western was still in his office when de Quadros called. De Quadros’ new office had nothing more than a desk and an empty bookshelf in it when he arrived. He laughs when telling this story saying, “We didn’t have an immunization program at PAHO so we didn’t have ANY information…so there was nothing!”1 He says he never questioned his decision to go to PAHO and remembers thinking to himself: “Let me see what will happen here….”2 Ultimately, what happened was that Ciro de Quadros became the innovative leader of what was arguably one of the most successful public health initiatives in modern public health history, that effectively raised immunization coverage levels throughout the Hemisphere and helped the Americas become the first region in the world to eliminate polio.

1 Author interview with Ciro de Quadros, May 18, 2012.
2 Author interview with Ciro de Quadros, May 18, 2012.
Chapter five revisits Everett Rogers’ ideal-type centralized and decentralized diffusion models discussed in chapter two, to examine the innovation development and diffusion processes associated with the Expanded Program on Immunization (EPI). The EPI was established within the WHO in 1974 and formally adopted by PAHO in 1977 and included six common and vaccine preventable diseases: diphtheria, whooping cough, tetanus, measles, poliomyelitis and tuberculosis. This chapter is structured around four primary objectives. First, it uses the development and diffusion of the EPI in the Americas to examine the emergence of what I argue is a hybrid diffusion system that effectively combined elements of both Everett Rogers’ centralized and decentralized diffusion models. Second, this chapter examines how the emerging hybrid system functioned and the ways in which it affected innovation-decision processes associated with the EPI, and later the polio eradication initiative, in the region. The innovation-decision process is defined by Rogers as, “the process through which an individual (or other decision-making unit) passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.”3 Third, chapter five demonstrates that the regional hybrid diffusion system helps explain not only the extremely rapid innovation adoption related to the EPI, but also the ways in which EPI was adapted, implemented, and institutionalized in the Americas throughout the 1980s and early 1990s. Fourth, this chapter explains how the EPI helped to establish norms related to stewardship and the central government’s stewardship functions that subsequently facilitated domestic capacity development in countries throughout the region and addressed capacity weaknesses discussed in previous chapters. These developments helped to establish the foundations at both national and regional

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3 Rogers, Diffusion of Innovations, 168.
levels that would facilitate effective control and elimination of polio in the region by 1991. The regional campaign is discussed in more detail at the beginning of chapter six.

Chapter five begins with a regional overview and examination of changes within the Pan American Health Organization starting in the mid-1970s with the shift in leadership from Dr. Abraham Horwitz (1959-1975) to Dr. Héctor Acuña (1975-1983). The changes described are both ideational and institutional. Throughout the remainder of the chapter, I examine the development and diffusion of the EPI in the Americas using specific aspects of the EPI to demonstrate the ways in which elements of centralized and decentralized systems were combined and institutionalized within PAHO and also within PAHO Member Nations. This chapter demonstrates that, in addition to the regional hybrid system (PAHO as the center and Member Nations as the decentralized units), the EPI helped facilitate the emergence of more effective domestic hybrid systems with national Ministries of Health/health sectors providing more effective centralized functions and stronger implementation capacity at state and local levels.

Changes at the Pan American Health Organization

Mexican physician and epidemiologist, Dr. Héctor Acuña, was elected to replace Abraham Horwitz as the Director of the Pan American Health Organization at the XIX Sanitary Conference in October of 1974. Just as the leadership transition from Fred Soper to Abraham Horwitz had signaled a significant change within the Organization in 1959, so too did the transition from Horwitz to Acuña in 1975. During the second half of the 1970s significant structural and organizational changes were made within PAHO that were intended to further decentralize the Organization and its work while simultaneously strengthening the centralized
functions PAHO was both obligated and authorized to provide for all Member Nations as outlined in PAHO’s various governing documents.

In addition to the structural and organizational changes within PAHO, the following sections outline some of the major ideational changes taking place within PAHO and within the region more broadly related to health and development. These changes included: (1) the shift from technical assistance to cooperation with an emphasis on more south-south cooperation among developing countries; (2) the declaration of the objective of “health for all by the year 2000” within PAHO and the WHO; (3) the emergence of community participation in health as an official policy and guiding doctrine at PAHO. All of these shifts were articulated as part of the broader primary health care movement that was gaining momentum during this period in the 1970s. Héctor Acuña explained, “As these changes in international health thinking evolved during the 1970s, so too did PAHO.”

Reevaluation and Reorganization: PAHO under Acuña

When Héctor Acuña began his tenure as Director of PAHO on February 1, 1975, one of his first initiatives was to establish a commission to carry out a comprehensive study of both PAHO headquarters and Field Offices that lead to significant changes in the structure and organization of the Bureau (the operational arm of PAHO). The changes were intended to strengthen PAHO’s centralized functions and make PAHO’s technical cooperation more effective and more country-driven, in order to support greater decentralization of the Organization. One of the focal

areas of the proposed adjustments concerned the links between program planning at central levels and program execution and implementation at the operational level both nationally and subnationally. Having more agile and engaged country-level officers was thought to be a way to support and facilitate more effective program adaptation and implementation by domestic actors. Acuña explained that PAHO needed to develop an “organizational and functional structure capable of fulfilling the multifaceted and ever-expanding mission” entrusted to the Organization.⁶

Acuña’s statement sounds very similar to a statement made 25 years earlier by PASB Director Fred Soper concerning the need to decentralize the Pan American Sanitary Bureau. Writing in 1950, Dr. Soper explained, “The health problems of the Americas are too complex, the program of the Bureau is too varied and the distances are too great to permit centralized administration. Only through zone and sector offices is it possible to maintain context with the health authorities of the interested nations and supervise field activities.”⁷ The Zone Offices created under Fred Soper marked a first step towards decentralization that was adapted and expanded during subsequent decades. Myron Wegman who worked at the Bureau under Soper explained that, “Decentralization had been an early significant principle in order to minimize the danger that technical staff people, far removed from the actual problems of the various countries, would attempt to provide programs and advice little adapted to actual national needs.”⁸

Abraham Horwitz continued the decentralization process by creating additional country-level offices that responded to Zone Offices. However, as the case studies in chapters three and four demonstrated, the ideals of decentralization promoted by PAHO leadership were frequently

poorly suited to the actual institutional capacities of PAHO Member Nations. The significant developments in domestic capacity that took place between Dr. Soper’s era and the middle of the 1970s made it possible and necessary to reevaluate the functions and duties traditionally provided by the Bureau relative to the countries themselves. Under Acuña, the Zone Offices established by Dr. Soper and the tiered system established by Dr. Horwitz were eliminated in favor of creating stronger country-level field offices that responded directly to PAHO Headquarters. Myron Wegman writes that, “Dr. Acuña’s further actions realistically and judiciously took into account the progress achieved in the member countries.” With stronger basic institutional capacity among Member Nations it was time to examine PAHO’s own institutional capacity.

Speaking in front of the IV Special Meeting of Ministers of Health in the Americas at the end of September of 1977, Director Acuña called for a “frank and open” discussion about the changes that PAHO needed to make in order to more effectively support the expansion of health care in the region. Acuña also raised a question concerning the best use of PAHO’s resources in light of the increasing domestic capacities of Member Nations. “The member governments should examine their needs and separate those with which they can deal adequately using their own resources from those that would seem to respond best to the efforts of an international body,” Acuña suggested.

In order to have effective national-level field offices to support the proposed decentralization, the capacity of the decentralized units (field offices) had to be improved. In response, PAHO organized a series of trainings for field staff that covered a range of issues intended to enhance their effectiveness and ability to respond to issues as they emerged at the

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9 Ibid.
10 Acuña quoted in Tropical Medicine and Hygiene News (October 1977): 12
operational level in country. In 1976 a “management improvement program” was put in place focused on upgrading management capacity of field officers and improving coordination and communication among staff at different levels. The following year, in 1977 a process of field office evaluations was put in place to monitor and evaluate the decentralization process and make adjustments as needed.

The reorganization of PAHO and the further decentralization with the creation of national-level field offices, also served an important function concerning domestic policy implementation and program evaluation. Whereas previously a PAHO field officer was responsible for a range of countries in a given Zone and had to report back through a tiered structure of offices before getting to PAHO Headquarters, the reorganization meant that each country officer was only responsible for their specific country where they were stationed. As a result, country officers were able to be more actively engaged with local health officials and better informed about problems and progress in specific health initiatives. By focusing only on one country, field officers could also more effectively work across multiple health areas in a given country and support more effective integration of programs by working with a broader range of national and local level health officials.

**Institutionalizing South-South Cooperation**

The organizational and structural changes that took place within PAHO during the second half of the 1970s were accompanied, or perhaps driven by, a broader ideational shift within the region in favor of greater south-south cooperation and exchange. This shift was part of a gradual evolution within PAHO and the region that had begun in 1947. Nancy Leys Stepan writes that, the directorship of Dr. Fred Soper starting in 1947, marked a sort of “Latin Americanization” of the
Pan American Sanitary Bureau that included the “transition” of the Bureau “away from an organization completely dominated by the US, to one more responsive to and reflective of Latin American needs.”\textsuperscript{11} The further Latin Americanization of PAHO occurred throughout the tenure of the Organization’s first Latin American director, Abraham Horwitz throughout the 1960s and early 1970s. During this time, a truly Latin Americanized organization in many ways remained an ideal. However, starting in the mid-1970s the Latin Americanization of PAHO and the ideal of south-south cooperation, were increasingly institutionalized. The following is an excerpt from an article written by PAHO Director Acuña in celebration of PAHO’s 75\textsuperscript{th} anniversary in December of 1977:

In addition to responding to change, an agency such as the Pan American Health Organization must also promote changes in philosophy and strategy...in a movement that will surely gather force in the coming years, the Pan American Health Organization has been working to stimulate the development of so-called “appropriate technology;” that is, technology designed solely to respond to the needs of the people...The normal flow of technology and research has been from the developed to the developing countries, but this practice has ignored the customs, traditions, and most importantly, the needs of the people. Lacking a firm base in the realities of the situation, such practice would have little impact on a nation's economic and social situation. Among the family of international organizations, PAHO is a recognized pioneer and leader in technical cooperation...Although the Pan American Health Organization is the oldest intergovernmental health agency, it maintains a youthful spirit. As the needs of its Member Governments change, PAHO responds. When new approaches are needed, the Organization will seek their implementation and continue to work closely with its Member Governments. It is a role far different from that which PAHO’s founders envisioned.\textsuperscript{12}

PAHO’s Quadrennial Report for 1974-1977 clearly reflects these changes stating, “A new dimension has come to characterize the program of cooperation: the fostering among developing countries of individual and collective self-sufficiency by strengthening their ability to deal creatively with national needs as they perceive them and within a context that is socially

\textsuperscript{11} Leys Stepan, \textit{Eradication: Ridding the World of Diseases Forever?}, 115.
relevant.” Acuña suggested that the common notion of “technical assistance” that had dominated international organizations in the past had a “corollary” that “advanced countries exported their methods and technologies in the health as in other sectors to developing countries, where often they did not work well.” In contrast, according to Acuña the corollary to the notion of “technical cooperation” was that developing countries “would adapt external methods and technologies to their own conditions or invent new ones to meet their requirements.”

PAHO members demonstrated their commitment to this shift by redesigning the PAHO Program for Technical Cooperation in 1976. Writing in 1977 Acuña explained, “These patterns of technical cooperation among developing nations are traditional in the Region of the Americas. Their present significance lies in their systematic and formal use as an instrument for collaboration among the countries of the Hemisphere.” While south-south cooperation and exchange had always been an ideal within the Pan American Health Organization, starting in 1977 the ideal was institutionalized. The effects of this shift will be seen throughout the development and diffusion of the Expanded Program on Immunization and regional polio campaign later in this chapter.

Putting the Public in Public Health and the Move to Community Participation

In addition to the shift within PAHO favoring technical cooperation among developing countries and greater south-south cooperation, another significant shift within the region during the 1970s was the emphasis on community participation in public health. Speaking in front of an international conference in October of 1975, PAHO Director Acuña summarized the recent

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14 Acuña, Toward 2000: The Quest for Universal Health in the Americas, 41.
15 Ibid.
history and current status of health planning within PAHO and its Member Nations. Acuña explained that during the past decade it had become increasingly apparent that health planning had to be applied in stages whereby objectives might include efforts to address new problems or the scale-up of existing programs to cover larger numbers of people.

Acuña stated, “It [health planning] must be a continuous process, with coherence and permanence, capable of constant improvement through trial and error.” Acuña continued pointing out that there was no single method for health planning but rather “a series of methods that may be applied in light each particular situation.” However, Acuña cautioned that, “in many instances services have been rendered or planned in relation to projects inspired not by the needs of the community, but by the desire to introduce imported techniques and procedures with doubtful relationship to the communities priorities.” He concluded stating, “Planning is no longer the property of the health planners, but a continuous responsibility of the whole health team.”

Acuña’s presentation called attention to the overly centralized approach to health planning that had been dominant within PAHO and domestic governments during the 1960s and early 1970s. He was explicitly stating that the needs of users (communities) were not taken into account early enough in the health planning process and thus health plans did not reflect the priorities, needs, or conditions, of local communities where they were meant to be implemented. Additionally, Acuña highlighted the need for greater adaptive capacity within domestic health systems and greater attention to adaptation rather than adoption among domestic policymakers.

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18 Ibid.
19 Ibid., 24.
Acuña’s comments suggest that the ideals of a more decentralized user-driven system expressed during the 1950s and 1960s, had not yet been effectively institutionalized with PAHO or PAHO Member Nations by the early 1970s.

Health for All by the Year 2000: Intentions versus Institutions

In 1977 both PAHO and the WHO established the extremely ambitious goal of achieving “health for all” by the year 2000. The following year, in September of 1978, over 3,000 public health officials, researchers, and advocates from all over the world convened in the Soviet Union for the International Conference on Primary Health Care. The declaration produced by the conference came to be known as the Declaration of Alma-Ata (named for the location of the conference). The Declaration contained a range of resolutions covering myriad issues including the extension of health coverage, the use of appropriate technologies, the rights and responsibilities of citizens and states, the balance of power between developed and developing countries, technical cooperation, and social determinants of health. The overarching message from the conference was that primary health care was the only possible way to achieve “health for all by the year 2000.”

Writing in 1983 Héctor Acuña stated, “At the beginning of the 1970s the predominant feature of the coverage situation in Latin America and the Caribbean was the lack of any health care whatever for two-fifths of the population.”20 Acuña explained that in the 1970s when the governments of the Americas decided to make a “massive effort” to expand access to health services to their entire populations in a short period of time, it produced a sort of “system crisis”

20 Acuña, Toward 2000: The Quest for Universal Health in the Americas, 64.
for the region’s health systems.\textsuperscript{21} One of the results of this crisis was that it exposed the deficiencies in existing practices, especially those related to the organization and delivery of care that were, in many instances, based on models and policies developed and used in the most advanced industrialized countries. Acuña stated:

The technology used, copied from the developed countries and basically designed to meet the needs of those nations, could not bring about the extension of coverage, not only because of the enormous costs involved, but also because it responded inadequately to the problems and characteristics of the very people whom the governments most wanted to reach: those who had no part in social progress.\textsuperscript{22}

The quest for “health for all by the year 2000” articulated by PAHO Member Nations as well as the WHO, and the “system crisis” it produced, resulted in an “urgent search for more appropriate procedures” that were applicable and better suited to meet the needs of developing countries and local communities.\textsuperscript{23}

The changes, both ideational and institutional, that occurred within PAHO and the region during the 1970s can be summarized as follows. First, institutional capacity in countries throughout the region had developed significantly so that PAHO’s technical cooperation had to be more effectively tailored to meet the needs of Member Nations as they continued to evolve, with domestic governments assuming greater initiative, authority, and responsibility over future program developments. Second, technical cooperation would henceforth be based on the belief that the solutions to health problems in Latin America had to come from Latin America, rather than more advanced industrialized countries, with PAHO facilitating south-south diffusion, near-peer observations and knowledge exchange opportunities, and technical cooperation among Member Nations. Third, achieving health for all by the year 2000 would require new organizational innovations within the health sector, collaboration among domestic institutions

\textsuperscript{21} Ibid., 84.
\textsuperscript{22} Ibid., 64.
\textsuperscript{23} Ibid.
and sectors of society, greater community participation, and more effective adaptation of programs and interventions to better match the resources available in different countries and needs of local communities. It was within this new context that the Expanded Program on Immunization (EPI) was born in the Americas in the late 1970s.

The Expanded Program on Immunization: The Emergence of a Hybrid Diffusion System

Everett Rogers asks, “Where do innovations come from? How do their origins later influence their diffusion and consequences?”24 Rogers suggests that, “The nature of an innovation’s diffusion and its consequences are often determined in part during the R&D work to create the innovation.”25 Rogers writes that:

Past diffusion investigations overlooked the fact that relevant activities and decisions usually occurred long before the diffusion process began: a perceived problem, funding decisions about R&D activities that led to research work, invention of the innovation and then its development and commercialization, a decision that it should be diffused, transfer of the innovation to a diffusion agency, and its communication to an audience of potential adopters. *Then* the first adoption of the innovation occurs, and the diffusion process begins.26

He argues that, “decisions and activities occurring in the R&D phase of the technology development process directly affect the later diffusion phase.”27 The history and development of the EPI, and later the polio eradication campaign in the region of the Americas, strongly support Rogers’ argument.

The following sections examine the diffusion of the EPI in the region of the Americas. The key aspects of the development process include: (1) the timing and sequencing of EPI-

24 Rogers, *Diffusion of Innovations*, 136; ibid.
25 Ibid., 159.
26 Ibid., 137.
27 Ibid., 161.
related development; (2) the involvement of potential adopters (public health officials in the Americas) in defining the “perceived problem” in need of solution; (3) the invention of the innovation (the EPI) by experts who are also potential adopters; (4) the decisions about the way in which the innovation (the EPI) should be diffused.

One of the key aspects of the Expanded Program on Immunization in the Americas was the timing and sequencing related to its development at both national and regional levels. There were a significant number of developments and advanced preparations made for the EPI starting two years prior to the EPI’s formal launch in the Americas in October of 1977. As a result, PAHO Member Nations were directly involved in driving the development process from the very beginning. PAHO took the first steps towards establishing the EPI starting in 1975 when PAHO officials met with WHO officials in Geneva where the EPI had already been formally adopted as of 1974. During the second half of 1975, PAHO organized and tested a region-wide epidemiological surveillance system for vaccine preventable diseases, and also piloted a special surveillance program focused specifically on polio. Weaknesses in domestic surveillance capacity were among the most commonly cited factors constraining domestic immunization programs in the region throughout the 1960s and early 1970s. Additionally, PAHO prepared a new vaccination reporting form whereby countries were asked to report quarterly instead of yearly, as had been the rule prior to 1975. Reporting procedures were also standardized in order to facilitate more effective cross-national comparisons. Both cross-national and within-country comparisons were extremely problematic prior to the early 1970s based on variations and inconsistencies in disease reporting procedures. These are examples of PAHO’s efforts to provide necessary centralized functions to support the EPI prior to its launch.
In 1976, PAHO organized four regional training and informational workshops and meetings with public health officials and policymakers from countries throughout the Americas. The meetings served two primary functions. The first was to introduce the basic ideas behind the EPI to public health officials in the region. Secondly, the workshops were intended to bring together public health officials working on immunization to discuss the current status of domestic immunization activities, assess the needs of Member Nations that could be addressed through different types of technical cooperation provided by PAHO, and generate buy-in for the EPI among potential stakeholders in the region. It is important to note that buy-in from high-level public health officials working on immunization was sought before country representatives and the Directing Council formally adopted the program.

The introductory meetings with public health officials in the region marked the onset of what Everett Rogers refers to as the “knowledge stage” of the innovation-decision process whereby potential adopters were introduced to the new idea and made aware of its existence and basic elements. The emphasis of the meetings was on: operational implementation in the countries; development of training curricula and educational materials; development of alternative operational and evaluation strategies; development and transfer of appropriate technologies; establishment of two-way information systems to obtain regional data on the target diseases and the vaccine requirements, and to dispense data to support country decision-making. During these meetings, public health officials and PAHO staff in the region established a basic consensus concerning the “perceived problem” that needed to be addressed, which lead to the next stage of the development process involving research on the problem and the “invention of the innovation.”

29 EPI Progress Report prepared for the XXVI Meeting of the PAHO Directing Council (July 27, 1979), 3.
In 1976 Director Acuña established an Inter-Divisional Taskforce on Immunization responsible for the research related to the EPI and the basic invention of the innovation (the establishment of the basic elements of the EPI and overarching design of the program). The Taskforce was charged with formulating a proposal outlining what PAHO’s role should be in developing and promoting the EPI and to develop a basic plan for working with national governments on the initiative going forward.30 The first thing the Taskforce did was compile and identify the primary or most commonly cited barriers (the perceived problems identified by domestic actors) that explained why many countries hadn’t adopted, implemented, or institutionalized national immunization initiatives up to that point.

The constraints cited by the Taskforce included the myriad constraints cited in chapters three and four: inconsistent technical guidelines and overarching programmatic norms for immunization programs established and disseminated by national ministries of health; insufficient population coverage during mass campaigns and lack of follow-up vaccination to protect subsequent birth cohorts; lack of resources or inconsistency of resources supplied by federal governments for immunization programs; weak subnational implementation capacity and subnational variation; poor coordinating and administrative capacity within ministries of health; poorly articulated roles and responsibilities related to immunization between national and subnational actors; weak or nonexistent mechanisms to facilitate community participation and inadequate public information initiatives.

Based on these constraints, the second activity of the Taskforce was to establish a range of relatively basic things that both PAHO and Member Nations could do to address these barriers at both the national and regional level. In sum, a central body/taskforce made up largely of PAHO staff from countries throughout the region was created to survey and integrate the needs

of Member Nations (as identified by the Members themselves) in order to develop the program to best address them. In a centralized system the needs of users would not have driven the development of the program (i.e. the innovation) and in a fully decentralized system it would have been difficult to develop and execute any sort of cooperative plan without a central coordinating body.

The Taskforce’s recommendations were then evaluated and refined by a Study Group appointed by the PAHO Executive Committee. Ciro de Quadros was the Immunization Advisor for the Study Group appointed by the Committee in April of 1976. In July of 1977 de Quadros presented the Study Group’s final report to PAHO’s Advisory Committee on Medical Research (ACMR). A key aspect of the EPI that stood in contrast to previous programs within the region and that distinguished the PAHO EPI from the global EPI under the auspices of the WHO, was that the EPI in the Americas included and prioritized ongoing operational research related to the program from the very beginning. Dr. Karl Western, Chief of the Communicable Disease Unit at PAHO, explained to the ACMR in 1977 that this research was to be carried out by national scientists and public health workers. This was in line with the broader changes taking place within PAHO favoring technical cooperation among developing countries and the use of “appropriate” locally adapted or generated technologies.

In speaking to the ACMR in the final session in 1977, after hearing the report from the EPI Taskforce, Director Acuña highlighted “several imperatives” guiding the ACMR’s subsequent work, the most important of which was the new concept of technical cooperation among countries. Acuña clarified that this was, “not a new label to replace the one of technical

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31 Members of the Study Group included PAHO Staff Members: Pedro Acha, Chief, Division of Disease Control; Karl Western, Chief, Communicable Disease; Jorge Rosselot, Regional Advisor, Maternal and Child Health; Nila Vallejo, Regional Advisor, Health Education; Fortunado Vargas Tentori, Medical Officer, Health Services; James Rust, Surveillance Officer, Communicable Disease; William Umstead, Chief, Procurement Office; Ciro de Quadros, Adviser in Immunization, Communicable Disease.
assistance, but had implications and involved changes that were extraordinary.”

“On the one hand,” Acuña explained, “the Member Governments no longer acquiesced in the old concept of the consultant from the developed country who, after analyzing the situation, made a diagnosis and proposed a solution.” According to Acuña, “The consultant now had to be someone who had lived and felt the problems of the developing countries, as did 75 per cent of the staff of PAHO, who came from countries in that stage of development. The consultant needs to join forces with national experts and to work with them as another member of the working team.”

Acuña went on to explain another form of technical cooperation among countries whereby PAHO served primarily as a broker for Member Nations, identifying national experts or helping governments to identify them, and making sure that they were well supported so that they were able to help their governments “diagnose and solve their own problems.”

The Director went on to explain that in applying new technologies to address health problems in the region it was imperative that technologies were “properly adapted to conditions in our countries or, even more desirable, generated by the countries themselves in response to prevailing conditions.” To use the words of Everett Rogers, Acuña was calling for the Member Nations themselves to serve as the sources of innovations and take greater control over deciding which innovations should be diffused and how the innovation diffusion process should be managed.

Collective Innovation-Decisions and System Effects

When the PAHO Directing Council formally adopted the EPI in October of 1977, the Directing Council called on PAHO to play “an active role,” working with countries throughout the region.

33 Ibid.
34 Ibid.
35 Ibid., 38.
and providing technical support to facilitate the implementation and institutionalization phases of the policy process. Whereas previously PAHO had largely limited its involvement to encouraging and facilitating diffusion and domestic adoption decisions, and provided its cooperative services to Member Nations based on their pre-existing priorities and programs, the resolution approving the EPI broke from the past. This was the first time in PAHO’s history that the Organization would actively facilitate, monitor, and evaluate implementation and institutionalization of the same program in every country in the region.

This was in no way top-down or externally imposed by PAHO on to Member Nations. On the contrary, it was the result of what Everett Rogers describes as a “collective innovation decision.” Collective innovation decisions are, “choices to adopt or reject an innovation that are made by consensus among the members of a system. All of the units in the system usually must conform to the system’s decision once it is made.”36 The choices linked to the adoption of the EPI in the late 1970s were made by consensus within PAHO and among Member Nations. The choices involved expanded responsibilities and functions provided by PAHO, and also expanded responsibility within Member Nations for their own domestic immunization programs. The concept of “collective innovation decisions” is revisited in chapter six as one of the explanatory factors driving the polio eradication initiative in the Americas.

The 1977 Immunization Taskforce report to the ACMR stated that, “The program [EPI] will encompass all countries that so desire.” However, the report explained, “It is not only desirable but it is also the duty of the Organization to try to influence the countries carrying out immunization activities to accept certain desiderata.”37 These desiderata included: (1) a national

36 Rogers, Diffusion of Innovations, KL873-74.
commitment to plan and implement permanent immunization programs and to evaluate progress and impact; (2) the appointment of national program managers with adequate authority to plan and administer the program; (3) national budgets allocated to support the program’s ongoing operation, long-term costing of permanent immunization programs including assessments of feasibility accounting for both external and internal resources needed; (4) definition of locally determined frameworks for delivering immunization services as part of existing or developing primary health care services; (5) direct involvement of the community in both planning and implementation of the EPI including participation of elected officials, community leaders, and civic organizations; (6) development of domestic laboratory and cold chain capacity to support EPI programs; (7) development of surveillance, monitoring and evaluation systems and use of evidence to inform subsequent policy decisions and program adjustments. All of these elements directly addressed the myriad implementation constraints cited in previous chapters, especially related to health system and administrative capacity within Brazil throughout the 1960s and 1970s.

By stating up front that PAHO had a “duty” to try to influence Member Nations to accept these core elements of the EPI, the Taskforce helped to establish a new norm within PAHO and the region, one that included an expanded role and responsibility for the Organization. More specifically, the EPI promoted the idea of PAHO as a sort of steward for immunization programs in the region. In addition to promoting norms related to stewardship within PAHO, the EPI explicitly established national governments as stewards of their own domestic immunization programs, outlining a series of essential stewardship functions for all PAHO Member Nations.

The objectives of PAHO’s technical cooperation outlined by the Study Group were well matched with the expectations or desiderata placed on Member Nations. Moreover, for every 38

38 Ibid., 8-9.
domestic stewardship function related to the EPI there was a matching element of technical cooperation provided by PAHO to support Member Nations in developing domestic capacity required to meet programmatic norms and guidelines.

User-Driven Innovation-Generation

In 1978-1979 EPI staff at PAHO consisted of one regional advisor (Ciro de Quadros) and three technical officers. One technical officer was stationed in Trinidad and Tobago to provide support for the English speaking Caribbean, a second worked out of Lima, Peru, and the third was based at PAHO’s headquarters. In spite of the limited staff, by mid-July of 1979, permanent EPI staff and EPI consultants had visited 23 countries in the region, some more than once, to advise governments, provide technical cooperation, and meet with domestic program officials as a sort of needs assessment that provided the foundation for the EPI training materials and methodologies.39

As a result of these interactions, EPI training materials were largely user-driven and based on the commonly identified needs of PAHO Member Nations themselves, rather than the needs of developing countries as perceived by international organizations or donor agencies in more advanced industrialized countries. In Rogers’ ideal-type centralized diffusion model, innovations are generated through formal R&D done by technical subject-matter experts and then diffused from the source at the top down to the potential users at the bottom. In his decentralized model, innovations are generated largely through experimentation done by non-experts who are often also users of the innovation. In contrast to either centralized or decentralized models, the experience with the EPI in the region of the Americas indicates that

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model innovations were the result of both experimentation and more formal collaborative R&D done by experts who were also frequently users (Latin American public health officials and health researchers).

As the Regional Advisor for the EPI at PAHO, Ciro de Quadros grounded the development of the EPI in cross-national lesson drawing and the horizontal diffusion of information among actors involved with EPI programs in countries throughout the region. According to de Quadros, when he began his work with the EPI at PAHO he was not interested in a sort of paternalistic top-down approach whereby “experts” were called in from more industrialized countries to “teach” Latin American actors. De Quadros’ statement was in line with broader changes taking place within the region regarding health care in the late 1970s, specifically the shift in favor of technical cooperation among developing countries (TCDC). PAHO articulated the shift in its approach stating, “Technical cooperation means that the developing countries guide their own advancement in all spheres including health, instead of relying on the external guidance implicit in the now outdated concept of technical assistance.”

Ciro de Quadros’ solution was to bring in some of the Latin American immunization program officials he knew and to have them lead the first EPI training courses and help develop the broader EPI curricula. Among those recruited by de Quadros were Fernando Gomes (Brazil), Emilia de Leon Coto (Costa Rica), and Otto Zeissig (Guatemala). De Quadros (laughingly) remembers that he basically brought national immunization officials to PAHO Headquarters in Washington and said, “Look, what kind of courses do we need to have…what do you think we should do?” He explained that first they went through and had a refresher on the

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40 Author interview with Ciro de Quadros, May 18, 2012.
42 Author interview with Ciro de Quadros, May 18, 2012. The curriculum development project was started in 1976 through a collaborative project between PAHO and the Centers for Disease Control (CDC) in Atlanta, Georgia.
six diseases the EPI was focusing on that lead to the creation of the first EPI training module. Next they began working on a module for the different kinds of vaccines they were going to be using, as well as how they had to be stored, transported, and administered. Then came a module on logistics and cold chain issues. Then there was a major overarching question concerning, according to de Quadros, “how do we program all of this…. how do we organize and plan our programs? And then how do we evaluate our programs? What kind of surveillance do we have and how do we do surveillance?” All of these discussions among different domestic public health officials, working in collaboration with one another under the auspices of PAHO, lead to the creation of the five core EPI training modules still used today. The five modules include: identification of the vaccine-preventable diseases; vaccine administration; the cold chain; programming; epidemiological surveillance.

EPI training materials and modules were designed for self-instruction so that each course participant could study the materials and answer written problems individually before joining their smaller workshop group. EPI documents state that, “Emphasis throughout is on individual participation within the group. Though a coordinator is available to provide expert advice, it is the participants themselves who determine what direction the discussion will take and how the various which arise should be resolved.” The EPI training modules and technical cooperation provided by PAHO were user-driven, based on needs identified by Member Nations, and evolved through national-international interactions facilitated in part by PAHO. The constant interaction between national and subnational health officials (“system users”) and PAHO staff and the way in which programs at both national and regional levels evolved as a result, is distinct from both centralized and decentralized diffusion models.

43 Author interview with Ciro de Quadros, May 18, 2012.
The active involvement of Latin American public health officials from the very beginning of the EPI’s development influenced the subsequent and extremely rapid diffusion of the EPI throughout the region. Everett Rogers writes that users within decentralized diffusion systems “feel a sense of control” over the innovation diffusion process. They more actively participant in making decisions about which problems are the most pressing and should receive priority, which solutions best address the problems identified, and what sources of information or examples should be sought out to inform user decisions about new innovations and how they might be modified to best fit domestic conditions. Rogers writes, “The high degree of user control over these key decisions means that a decentralized diffusion system is geared closely to local needs.” However, EPI-related diffusion processes weren’t entirely decentralized at either national or regional levels. There were important centralized functions provided by ministries of health and other institutions at the national level as well as a range of centralized functions provided by PAHO at the regional level. For example, PAHO played a critical role in facilitating the translation of user experiences and needs, into a coordinated program of action within the EPI. This combination of user-driven innovation development and diffusion that is coordinated and institutionalized by a central body, suggests the emergence of a more hybrid system in the region during this period of time.

Regionally Regulated Reinvention: Fidelity vs. Adaptation

Another aspect of the EPI that lends itself to a more hybrid diffusion model concerns the issue of adaptation or re-invention occurring throughout the diffusion process. Everett Rogers defines

45 Rogers, Diffusion of Innovations, 298.
46 Ibid.
reinvention as “the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation.” A key difference between the decentralized and centralized diffusion systems outlined by Everett Rogers and the center-periphery model discussed by Donald Schön, concerns the amount of reinvention that occurs for a given innovation during the innovation diffusion process. In his “center periphery model” Schön writes that the assumption is that the innovation to be diffused already exists in its final and/or supposedly optimal form at the time of diffusion. Similarly, Rogers explains that in a centralized system there is minimal reinvention and adaptation during the innovation diffusion process, in contrast to decentralized systems that are characterized by a high degree of reinvention as the innovation diffuses among members of the system.

Although argued by scholars such as Rogers to increase the likelihood that innovations are best suited to meet the needs of adopters, adaptation and reinvention are often in tension with notions of implementation fidelity, or the extent to which a program or model is implemented according to the guidelines established by the program’s developers as part of the original model.

A way to mitigate this proposed “fidelity-adaptation” tension comes from James Dearing. Dearing proposes the idea of “guided adaptation” that involves:

Explicating the underlying causal components of a program as well as examples for operationalizing those causal components in practice, and clarifying to implementers which aspects of a demonstrated program are central to its observed effect and which components are peripheral and more likely changeable without deleterious effects.

Reinvention that still maintains the core elements of an innovation can have numerous advantages as far as implementation and institutionalization are concerned. For example, Rogers proposes that the degree of re-invention is associated with both the rate of innovation adoption

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47 Rogers, Diffusion of Innovations, KL3425-28.
and the degree of sustainability of an innovation.\textsuperscript{49} Innovations that can be effectively reinvented or adapted by adopters without compromising the performance of the innovation are arguably more likely to suit the conditions and needs of adopters and facilitate more effective implementation as well. Moreover, Rogers suggests that, “Re-invention can be encouraged if inventions are designed with the possibility of re-invention in mind.”\textsuperscript{50}

Within the context of the development of the foundations of the EPI during the second half of the 1970s, one of the key functions provided by PAHO and EPI staff at both regional and national levels was to identify and articulate the core elements of the innovation (the EPI) that had to be maintained in order for the program to be effective when adopted and adapted in countries throughout the region. This established the parameters for domestic public health officials (both national and subnational) concerning reinvention. It also helped strengthen the centralized functions of national health ministries and related institutions relative to subnational units in the areas of program development, establishment of programmatic norms, and provision of technical guidelines. These centralized functions were all core aspects of stewardship related to the EPI. Both regional and national officials encouraged adaptation, so long as adaptation occurred within the collectively established and agreed upon boundaries. Decentralized program adaptation and implementation were facilitated by a centrally established and coordinated set of guidelines and programmatic norms that enabled what Dearing referred to as a sort of “guided adaptation.”

The establishment and dissemination of clearly articulated programmatic guidelines was one of the areas where domestic capacity was notoriously weak in the region during the 1960s and early 1970s. The examples from the Brazilian case studies in chapters three and four

\textsuperscript{49} Rogers, \textit{Diffusion of Innovations}, 183.
\textsuperscript{50} Ibid., 181.
demonstrated how poorly articulated and inconsistent programmatic guidelines provided by the Ministry of Health, constrained effective implementation. In the case of the National Polio Control Program (NPCP) in the early 1970s, Dr. João Baptista Risi Jr. cited insufficient programmatic guidelines and oversight as having contributed to the abandonment of the NPCP and its ineffective implementation in the 14 participating states. Although the Ministry of Health stated that state-level actors should adapt the program to better suit local conditions, a combination of weak guidelines provided by the Ministry of Health, a lack of oversight or evaluation, and weak subnational adaptive capacity, resulted in ineffective subnational implementation in many instances.

EPI Training Workshops: Learning in Phases

When the PAHO Directing Council formally adopted the Expanded Program on Immunization in October of 1977, there was a consensus that building domestic organizational, managerial, and administrative capacity at all levels through training and education had to be the program’s priority during the first several years. Experiences from domestic implementation attempts throughout the region during the 1960s and early 1970s had revealed a significant shortage of managerial and administrative personnel at national and subnational levels. PAHO’s official position was that the primary reason that immunization programs in the region had not been more effective during previous decades was “inadequate application of present knowledge” which could be addressed by “transferring already available knowledge to national staff through training.”51 The objective outlined by PAHO was to facilitate the adaptive capacity of national

and subnational EPI staff required to translate knowledge and existing innovations into effective and locally suited programs.

From the very beginning there was a priority placed on gradual and experience-based program expansion that is evident in the organization and structure of EPI-related training workshops. The Director’s Report for 1978 noted that, “Like any fine mechanism, a good immunization program takes time and skill to construct and once built can break down if the least of its parts falters.”

Echoing this statement, formal EPI-related training was designed to proceed in three different but interrelated and complementary phases. Each phase of EPI-related training focused on a different group of domestic actors working at different levels of the policy system and with different EPI-related responsibilities and training needs. The objective was to strengthen the centralized stewardship functions provided by national ministries of health and related agencies, as well as adaptive and implementation capacity at state and local levels.

Phase one consisted of regional workshops involving high-level public health officials from different countries who were brought together in order to facilitate cross-national exchanges of experience and information. Phase two consisted primarily of replicating phase one workshops at the national level including mid-level staff with supervisory and administrative responsibilities for day-to-day management of immunization programs. The third phase focused on local-level actors with EPI trainings conducted by domestic public health officials with a heavy emphasis placed on local adaptation of program materials to suit domestic conditions and communities.

53 A fourth phase begins in 1985 with EPI courses on surveillance training.
Phase 1: Pitching the EPI, Political Priority, and Policy Learning

Among the primary implementation constraints highlighted by the 1977 EPI Taskforce report were inconsistent political priority for immunization programs among government officials and issues concerning inadequate vaccines supplies and domestic cold chain capacity. Additionally, inconsistent programming, insufficient long-term planning, unclear and often nonexistent overarching programmatic norms and guidelines for immunization programs provided by national ministries of health, and a lack of monitoring and evaluation, were cited in virtually every Annual Report of the Director during the 1960s and early 1970s as ongoing barriers that prevented progress in domestic immunization programs throughout the Americas. All of these factors are related to stewardship and health system capacity as discussed throughout chapters three and four.

Based on these common constraints, the EPI Taskforce suggested that before adopting the EPI each potential adopting country should have clear “government commitment” for expanding existing immunization services. The Taskforce’s definition of “government commitment” related to the EPI meant: including immunization in the government’s overall health plan; having a budget allocation specifically designated for expanded immunization activities; having a full-time national immunization program manager appointed with clearly defined responsibilities for expansion activities. The three aspects of “government commitment” outlined by PAHO’s EPI Taskforce, are three of the core elements of health system stewardship outlined by the WHO’s annual report on health systems where the concept of stewardship was first introduced within the WHO in 2000. In sum, the EPI Taskforce suggested

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that before adopting the EPI, each country should establish the national government as the steward of the nation’s immunization program.

During the first phase of the EPI’s development PAHO helped to mobilize high-level government commitment for immunization programs in different ways including through regional training workshops and by creating incentives for national authorities. Incentives primarily included EPI-related technical cooperation provided by PAHO and vaccine procurement services provided through the Revolving Fund discussed later in this chapter. In order to mobilize support for national immunization programs the EPI had to get buy-in from national public health officials. Accordingly, the first phase of EPI training targeted senior level public health officials with national-level responsibilities linked to immunization programs. The stated purpose of phase one was, “to encourage countries to place a high priority on immunization programs, by exposing senior public health officials to the benefits of expanding immunization coverage and giving them the conceptual tools to evaluate and improve their country programs.”

Two regional phase one workshops on EPI planning, management and evaluation, were held in San José, Costa Rica (July 1978) and Lima, Peru (January 1979). Two additional regional phase one workshops focused on cold chain management and logistics were conducted in Quito, Ecuador (May 1978) and in San José, Costa Rica (July 1978). Between May of 1978 and January of 1979, when phase one was completed, 132 public health officials from 20 countries and territories in Latin America had participated in regional EPI training workshops. All 132 participants had national-level responsibilities for immunization or related health programs in their respective countries.

57 Ibid.
The training sessions were organized into small workshops including senior public health officials from multiple countries as well as “monitors” with a broad range of field experience. According to EPI documents, “Small workshops allow participants to learn by exchanging ideas and experiences among themselves and confronting actual problems in the field, rather than the traditional lecture-type approach.” Both the materials and the methodology used were evaluated and “strongly endorsed” by course participants in the regional course held in Lima in 1979. The *EPI Newsletter* reported, “These courses will continue to evolve as new program experience is acquired, and it is hoped that the direct participation by health officials at all levels will give new impetus to immunization programs in the Region.”

In addition to helping mobilize political priority for the EPI and provide training for national program managers, the phase-one workshops also served another critical function. Bringing national immunization program officials throughout the region together to discuss common problems and exchange experiences facilitated the establishment of a regional community of experts related to immunization in the Americas. As discussed in chapter two, transnational actor networks and communities of experts played a key role in driving polio vaccine diffusion in the region during the late 1950s and early 1960s.

The networks and regional communities facilitated the circulation of ideas and innovations and also provided an important source of evaluative information for public health officials. As discussed in chapter two and by Everett Rogers, potential adopters of a new innovation are exposed to information through a range of different communication channels that affect diffusion in different ways. The regional actor networks established by the EPI training workshops and subsequent forums (discussed later in this chapter) provided opportunities for

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58 Ibid.  
59 Ibid.
domestic immunization officials to exchange information with one another about their own experiences with new innovations or ideas linked to the EPI. This information was arguably more influential for domestic policy makers because it came from domestic actors in similarly situated countries within the region, as had been the case with the evaluation information exchanged among Latin American actors related to the live oral polio vaccine during the late 1950s. The influence of these regional networks and communities of experts will be discussed in more detail later in this chapter.

Phase 2: National Adaptation and the EPI

One of the common constraints cited in chapters three and four was insufficient (and sometimes nonexistent) leadership provided by national government officials, and a lack of consensus or technical guidelines provided by ministries of health to guide immunization initiatives. Immunization programs frequently lacked clear programmatic norms, operational procedures, or even basic administrative guidelines or manuals. These basic centralized functions are essential aspects of stewardship and provide the foundation for the development of public health programs. PAHO’s Annual Report for 1979 stated, “Immunization activities have lagged in developing countries because present knowledge has been inadequately applied. Although gaps do exist in some technical and operational areas and research will be necessary to answer some questions, the most important concern is training national staffs in already available knowledge and skills to bring about improved program planning and expanded operations.”60 In an effort to address this gap between existing knowledge and its application, the second phase of the EPI training strategy was focused on the training of national staffs in already available knowledge.

and skills using the EPI modules described previously that had been developed by Latin American immunization program officials.

The second phase of EPI trainings began in February of 1979 and targeted “middle level supervisory personnel” involved in the day-to-day management of immunization activities. This second phase was explicitly designed to address domestic implementation capacity. Training materials for the national level workshops were adapted from phase one regional workshop materials. Prototypes of the phase two EPI curricula were tested in national EPI training workshops in Peru and Honduras in February of 1979 where 80 national program staff received training. From March through May of 1979 the materials were further adapted based on feedback received in the first trials and ongoing assessments of the needs of domestic immunization program staff. The materials were tested again in national workshops in Bolivia and Colombia in June and July of 1979. National program staff from both Ministries of Health who had participated in regional EPI workshops coordinated the trainings with assistance from EPI staff from PAHO. Ultimately, between 1979 and 1981, 1,246 national EPI program staff members had been trained in 37 national (phase-2) EPI workshops conducted in 30 Latin American and Caribbean countries.

The following example of a national EPI workshop conducted in Colombia in 1979 helps to provide a better understanding of how the national workshops functioned. Colombia held its first national EPI training workshop from July 2-7, 1979, in Bogotá. The workshop included 34 nurses, doctors, epidemiologists, and technicians, who were all national public health officials with direct responsibility for different EPI-related activities. PAHO provided four consultants to assist with the workshop who were joined by a representative from the Colombian Ministry of

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Health. In addition to the five EPI training modules and small-group discussions, the workshop also included a fieldwork component. Workshop participants were sent out into the city to observe and evaluate immunization programs in urban health care centers throughout Bogotá. The EPI Newsletter reported, “Participants considered this practical application of knowledge acquired during the course an invaluable part of their training, and similar field experiences are planned for all future national courses.” This is an example of an innovation that was generated or adapted by a user in the process of implementation and then diffused back up to the central coordinating body (PAHO’s EPI) and ultimately incorporated into the EPI’s strategy and re-circulated back down to other potential adopters.

From its inception the EPI stressed the importance of systematic evaluation of all aspects of the program, including but not limited to formal training activities. EPI workshop participants were asked to take a short written exam both before and after the course to test their functional knowledge related to the EPI training materials and provide an objective measurement to evaluate the impact of EPI workshops. A consistent finding across pre and post-tests administered as part of national workshops in 1979 was that on average, participants provided twice as many correct answers upon completing the course. The EPI Newsletter reported that the results of the pre and post-tests indicated that participants in national courses “are returning to their areas of work with a good grasp of the concepts and procedures involved in implementing the EPI in their countries.”

The data generated by the pre and post-test evaluations provided valuable information for EPI staff at both national and regional levels. Evaluations highlighted specific areas where additional training was needed, thus enabling workshop organizers to adjust trainings and

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64 Ibid., 3.  
materials accordingly. This information was used to supplement more formal evaluations of course materials and methods provided by course participants at the end of all workshops (evaluations are discussed later in this chapter). The *EPI Newsletter* explained that the information generated by the different evaluation mechanisms served to “identify the areas in which EPI should be concentrating its energies in order to attain the most effective implementation of EPI programs.”\(^6\) Additionally, the evaluations were a way to assess the extent to which core elements of the EPI materials and modules were being maintained throughout the adaptation and early implementation processes. This became increasingly important as the EPI entered the third phase of training in early 1980 that focused on local-level training and program implementation.

**Phase 3:**
**Trickle-Down Training: Adaptation and Local Ownership**

One of the core objectives of the phase-two national EPI workshops was to create “multipliers” in every country. Multipliers were health workers who had participated in phase-two national EPI workshops, who would then replicate the EPI courses at the local level as part of the third phase of EPI training focused on community level health workers. It is worth noting that this trickle-down training strategy was a core element of the Cuban polio immunization campaigns in the early 1960s and one of the primary ways in which Cuban public health officials effectively circumvented the severe shortages of more formally trained health personnel on the island during this period.

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Multipliers were encouraged to adapt the basic EPI training modules and materials to better suit the needs and conditions of local health systems and communities. In their work on implementation fidelity Castro et al. propose two basic forms of adaptation that involve modifying program content and modifying the form of program delivery. Modifying the form of program delivery can include changes in characteristics of people delivering the program (e.g. community health workers or volunteers instead of doctors), the channels of delivery through which information about the program are communicated, and the location of delivery (e.g. public spaces such as schools or churches or temporary vaccination posts instead of doctor’s offices).

The multiplier effect and different types of adaptation can be seen in a brief example from Guatemala. When Ciro de Quadros began building a group of Latin American immunization officials to help develop the EPI training modules and lead the first regional EPI workshops, Otto Zeissig, the National EPI Program Manager from Guatemala, was one of his first recruits. In November of 1979 Zeissig helped to organize Guatemala’s first national EPI workshop that was attended by 67 public health professionals who were responsible for different aspects of immunization programs throughout the country. The objective was to create multipliers who would replicate the workshops in their different areas of public health work linked but not limited to immunization.

Several months later, in February of 1980, a second EPI workshop was organized specifically for the teaching staff of nursing schools throughout Guatemala. The workshop was intended to produce additional multipliers among nurse educators at the teaching level and was attended by 31 nurses from 8 different educational institutions. A local EPI workshop was

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68 Castro, Barrera, and Martinez, “The Cultural Adaptation of Prevention Interventions: Resolving Tensions between Fidelity and Fit,” 44.
organized the following month in March of 1980 that included 66 local public health workers from three different neighboring districts (towns). The participants included physicians, nurses, public health inspectors, rural health technicians, and nursing auxiliaries, who were broken up into smaller groups according to their profession and immunization-related work performed. Two different versions of the basic EPI course materials covering the five EPI modules were prepared. Physicians, nurses, and inspectors received materials containing more technical information, while the materials for nurse auxiliaries and rural health technicians focused on more operational aspects of the EPI. This links back to Castro et al. and the form of adaptation that involves modifying the program content as opposed to the form of program delivery. The diversity of professions represented at the local EPI workshops helped to facilitate a broader diffusion and integration of EPI materials and related programmatic norms into other relevant programs and health initiatives. As usual, a pre and post-test was given to all workshop participants and, as usual, participants scored twice as high on post-tests upon completing the training.\textsuperscript{70}

By the beginning of 1981 phase three was well underway in many countries in the region. Local EPI workshops were shorter than national and regional workshops but followed the same small-group discussion model with EPI staff that had participated in national workshops serving as facilitators. Pre and post-tests were adapted to match local course materials and consistently given to provide impact measures as in phase two trainings. By the end of 1981, 6,448 local health workers had participated in 143 local (phase-3) EPI workshops that were conducted in 12 Latin American and Caribbean countries.\textsuperscript{71}

\textsuperscript{70} Information on the Guatemalan EPI trainings comes from the \textit{EPI Newsletter}, Vol. III, No. 1 (February 1981): 2.
During the late 1950s Latin American public health officials made a series of decisions concerning the adoption and use of the inactive Salk vaccine and the live oral polio vaccines. As argued in chapter two, several of the key diffusion mechanisms that influenced domestic adoption and implementation decisions concerning the two vaccines, included: (1) demonstration effects or near-peer observations of the experiences of previous adopters; (2) innovation-evaluation information circulated by PAHO among actor networks throughout the region; (3) knowledge exchange forums where public health officials and researchers could directly exchange experiences and new information. These same basic mechanisms were similarly influential to the EPI during its initial development and diffusion and as EPI programs were implemented by national and local public health officials during the late 1970s and early 1980s.

One of the key diffusion mechanisms deployed by PAHO during this period was the use of knowledge exchange forums to facilitate “peer consultation.” The World Bank Institute (WBI) defines peer consultation as, “a process by which peers work together in small groups for mutual benefit, providing critical, yet supportive, feedback. The peer consultation process supports the diagnosis and analysis of a subject through reflective exchanges and practice. The key advantage of peer consultation is the contextual relevance and application of the feedback sought from peers.” PAHO facilitated peer consultations linked to the EPI in a number of ways, including through the organization of periodic meetings of national EPI program managers including members of the emerging regional community of immunization experts.

The first Regional Meeting of EPI National Program Managers took place in Quito, Ecuador, from May 18 to 22, 1981. At the meeting, representatives from 20 different Latin

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American countries (this included Canada and the United States) presented the major problems they faced in implementing immunization programs in their respective countries related to ten different subject areas. The subjects included: immunization and primary health care; programming; strategies for extending coverage; supervision and continuing education; cold chain; community participation; coordination; personnel training; information system and epidemiological surveillance; administration of funds and resources. The participants were then broken up into smaller groups where possible solutions to specific country-level as well as regional constraints were discussed.

By the end of the meeting participants had made a list of priority problems for their country’s EPI program and a corresponding list of possible alternatives and strategies that could be used to mitigate these problems in the future. These lists were drawn from both the small-group sessions as well as recommendations made by other participants based on their own domestic experiences. In addition to coming up with lists of priority areas and solutions to ongoing implementation problems, participants drafted timetables outlining concrete measures that should be taken in order to achieve the goals determined during the meeting. Timetables included deadlines for completion and quantifiable measures of progress that could be reported back to PAHO and discussed at future regional meetings.

Domestic EPI policies were directly influenced through the advice and involvement of policymakers from other countries participating in the Regional EPI Meeting. Reflecting on the earliest days of the EPI Ciro de Quadros explained:

We were all learning from each other, all working as a team…and then because we would bring everybody every year, together, everybody would bring their plan (National Plan of Action or NPA) and then we would divide everyone into different groups of ten and then

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74 Information about the first regional meeting of EPI national program managers comes from the EPI Newsletter, Vol. III, No. 3 (June 1981): 4-5.
they would peer review the plans. So it wasn’t me telling them your plan is wrong or has problems, it was all of us sitting around the table and the guy from Argentina suggesting something to the guy from Bolivia and the guy from Paraguay suggesting something to the guy from Costa Rica…and then people would redo the plans. And every year they would do that.75

The EPI Revolving Fund:
Facilitating and Incentivizing Stewardship

One of the ways that PAHO helped to facilitate and incentivize the mobilization of national resources for the Expanded Program on Immunization (and later polio eradication) while simultaneously supporting more effective program implementation was through an organizational innovation known as the EPI Revolving Fund (RF). The Revolving Fund (approved by the Directing Council in 1977 but not operational until the end of 1978) is, “a procurement mechanism for essential vaccines, syringes, and other related supplies of immunization programs for Member States and Institutions.”76

PAHO facilitated domestic vaccine purchases prior to 1977 through a revolving fund, however the fund was designated as an emergency fund and purchases were done on a country-by-country basis and only as a last resort. Additionally, the previous emergency fund did not have any mechanisms for facilitating capacity development and or long-term planning. The primary objective of the RF was and is to ensure a reliable and high quality supply of vaccines and related materials at the lowest rates possible, to participating members of the Revolving Fund.77 Initially, EPI vaccines and related supplies such as syringes could be purchased through

75 Author interview with Ciro de Quadros, May 18, 2012.
76 Resolution CD25.R27 of the 25th Meeting of the Directing Council (1977) authorized the establishment of the PAHO Revolving Fund (RF). The RF is a procurement mechanism for essential vaccines, syringes, and other related supplies of immunization programs for Member States and Institutions.
77 “Revolving Fund Operating Fund Procedures” (PAHO) website at:
the RF at savings of 70-82% when compared to what individual countries would have otherwise paid if they had purchased the vaccines directly from commercial suppliers.\textsuperscript{78}

Unlike its predecessor, the UNICEF Procurement Division, that is also a pooled procurement mechanism intended to support immunization programs in developing countries largely through donor contributions to UNICEF, the RF does not donate vaccines or its services to participating countries. Countries participating in the RF not only pay for their own purchases they also cover the majority of the operating costs related to the Fund. This has been true since its inception. In addition to paying for purchases, members pay a recapitalization fee of 3.5% on their purchases that goes into a common pool that serves as a line of credit for the RF to ensure continuity of operations. As a result of the recapitalization fee and common pool, the RF is able to offer more flexible terms of payment to members. For example, countries are not required to pay for purchases in advance. Instead, once the supplies are received, each country has 60 days to make the payment in full. Countries are not allowed to make additional purchases through the RF until payment is received.\textsuperscript{79}

Participating in the Revolving Fund has significant financial incentives in terms of savings on vaccines and supplies, as well as savings in administrative and procurement costs that would be incurred by countries in the absence of the RF or some other pooled procurement mechanism. However, in order to take advantage of the financial and administrative benefits conferred by membership in the RF, each country has to meet several significant membership requirements. When they were initially established, each of the requirements was somehow related to the EPI training strategy and the EPI’s overarching objectives (both national and


\textsuperscript{79} Ibid.
regional) focused on domestic ownership and self-sufficiency. Additionally, each of the requirements was directly related to stewardship outlined by PAHO’s definition of “government commitment” in the 1977 Taskforce report.

In order to participate in the Revolving Fund each country had to appoint a National EPI Program Manager who had “the authority to develop and implement the program.”\textsuperscript{80} By insisting on the creation of a national-level position and emphasizing the authority of the designated program manager, PAHO was essentially attempting to facilitate or incentivize the creation of political space for immunization within the policy subsystems of participating nations. To use Howlett et al.’s explanation of policy learning, the objective was to help domestic communities of experts and immunization officials, gain access to the domestic policy process to facilitate more effective policy learning. This was particularly important as EPI programs entered different stages of implementation and as various aspects of EPI programs had to be adjusted based on accumulated domestic experiences and relevant experiences of near-peers.

Within the first year there were EPI Managers in every country in the region. EPI Managers were responsible for overseeing the development of national immunization plans or National Plans of Action (NPAs) and developing necessary program budgets, which were another membership requirement. In order to participate in the RF each country had to devote a specific line item in their annual national budget to cover the costs of vaccines and related supplies included within the national EPI Plan of Action developed by EPI Managers.\textsuperscript{81} It didn’t matter what percentage (if any) of the vaccines and supplies used within a country’s EPI were purchased through the RF. Countries could opt in and out of purchasing from the RF as they

\textsuperscript{80} EPI Newsletter, Vol. 1, No. 1 (May 1979): 3.
\textsuperscript{81} Countries were not required to cover the entire cost of their national immunization program through domestic resources, however, national budgets and national plans of action had to indicate which costs were covered by domestic resources and which specific areas were being covered by external sources that included also identifying what those external resources were.
chose and could also purchase some but not all of the needed supplies through the Fund. This was particularly important to ensure that countries that could produce some of their own vaccines would still have an incentive to purchase those they could not produce domestically through the RF to contribute to the Fund’s ongoing recapitalization.

This flexibility aside, participation in the Revolving Fund required domestic governments to assume greater and more consistent financial responsibility for their immunization programs. More specifically, participating in the Fund required an explicit recognition that the stewardship of domestic immunization programs was a national government responsibility. This addressed commonly cited implementation constraints in the region during the 1960s and 1970s concerning inadequate vaccine supplies or shortages and the absence of clear financial responsibility for immunization programs. Developing national EPI program budgets and vaccine forecasts were integrated into regional EPI training workshops as well as national EPI program manager’s meetings held every other year. National Plans of Action developed by EPI managers and discussed at regional meetings included medium (single year) and longer-term (multi-year) forecasts of vaccine needs that had to be sent to the RF by mid-July of the prior year. National Plans and forecasts had to be “comprehensive and realistic” and were subject to peer review by national EPI managers from other countries as well as PAHO’s EPI staff and members of national and regional Inter-Agency Coordinating Committees (ICC) (discussed in chapter six).

During the process of reviewing and revising NPAs and vaccine forecasts, one of the things that EPI Managers did was to identify specific areas or activities within their national plans where external resources or technical cooperation were needed. This would become especially important during the 1980s related to the regional polio campaign and the increased involvement of external actors and donors. Funding gaps and external resources needed were
also included within and identified during the multi-disciplinary EPI evaluations (discussed below). As part of both processes PAHO staff worked with domestic EPI officials to identify possible donors or sources of external funding to match specific areas where resources were needed.\(^8^2\) The external agencies that fulfilled the bulk of these requests included PAHO, USAID, UNFPA, the European Economic Community (EEC), and UNICEF.\(^8^3\)

The Revolving Fund is sometimes mischaracterized as a sort of donor agency for the Americas. However, this is highly inaccurate and inconsistent with PAHO’s operating principles. Official documents dating back over fifty years have been explicit about the role of the Organization relative to domestic governments and the parameters within which it operates. The Annual Report for 1950 explained, “The Bureau aids in the purchase of supplies for Member States but it is not a source for supplies except in emergency or catastrophic conditions and then only for immediate emergency medical and public health materials.”\(^8^4\) The Report continued that, “as a general principle,” the Bureau should not “do for a Member State those things the State is best fitted to do for itself...The Bureau must maintain its position as a source of technical rather than financial aid to Member States.”\(^8^5\)

The Revolving Fund has these basic principles at its core and has since its inception in 1977. Deroeck et al. note that one of the key factors explaining the influence of the Revolving Fund is that, “it was the countries themselves and not an outside group” that served as the impetus for establishing the Fund in the first place.\(^8^6\) The authors suggest that, “This fact has helped ensure country ownership in these programs, motivation for countries to participate, and

\(^8^2\) PAHO’s Annual Report for 1984 explained that the major areas where external support and technical assistance were requested for 1984-1985 included: training, cold chain equipment and evaluations, the purchase of vaccines, national EPI evaluations, and inter-country visits.

\(^8^3\) Polio: The Beginning of the End (Geneva, Switzerland: World Health Organization, 1997), 55.


\(^8^5\) Ibid.

the programs’ responsiveness to the needs of its member states.” The Revolving Fund originated in the Americas, was institutionalized by PAHO, and was designed to specifically address the needs and objectives of Member Nations. It also helped to promote the concept of stewardship within Member Nations and institutionalize the stewardship functions carried out by national governments related to their domestic immunization programs.

Monitoring and Evaluation: Governing the Commons and Policy Learning

One of the problem areas identified by PAHO Member Nations and one of the primary factors cited to explain minimal progress in national immunization initiatives prior to the launch of the EPI, was the lack of systematic monitoring and evaluation of national and regional programs. In response, in 1980 EPI/PAHO staff designed and tested a methodology for carrying out “multidisciplinary evaluations” of national EPI programs to supplement monitoring and evaluation activities that were promoted within EPI training modules. One of the key elements of the EPI evaluation methodology was the composition of the evaluation team itself. Instead of external monitors coming in to evaluate programs, EPI evaluation teams included three different groups of participants: health officials from the country being evaluated, PAHO program staff and consultants, and often EPI officials from other countries (including informal observers).

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87 Ibid.
89 In addition to the monitoring function, the multidisciplinary evaluations also provided another knowledge exchange instrument through which immunization program staff could learn from one another’s experiences by participating in or acting as observers on EPI evaluations outside their home countries. Colombia was the first country in the region to carry out an EPI evaluation in November of 1980, followed by Bolivia in December. The National EPI Manager from Ecuador participated as an observer in the Colombian evaluation. Argentina sent an observer to participate in Bolivia’s first EPI evaluation and then conducted its own EPI evaluation the following year that was observed by a senior official from the Brazilian immunization program. In addition to direct observation, detailed information about the evaluations was printed in the EPI Newsletter between 1980-1986 and discussed during regional and subregional forums and EPI manager’s meetings.
This combination of internal and external actors is consistent with one of PAHO’s longstanding principles, that of supporting synergistic relationships between domestic and international actors and interests. The multidisciplinary EPI evaluation process was intended to “identify the principal problems which are impeding progress; to study possible solutions, expressed in the form of recommendations; and to design a plan of action to implement these recommendations.” The two-week long evaluations covered virtually every aspect of immunization programs from vaccine supply and cold chain logistics to program administration, coordination, and financing.

One of the important aspects of the evaluations was related to training and local-level adaptation of EPI materials and programmatic norms. From the beginning, the EPI training modules were designed so that they could be easily adapted to suit a wide variety of domestic conditions in different PAHO Member Nations. In addition to encouraging the national and local adaptation of EPI materials and immunization strategies, PAHO also actively facilitated and encouraged the ongoing monitoring and evaluation of adaptations to ensure that core elements were maintained. The EPI evaluations devoted significant attention to training and educational activities visiting training courses, reviewing course materials and program manuals, conducting a range of site visits to evaluate how EPI materials and programmatic norms were influencing the day-to-day implementation of immunization programs. As a result, the evaluations provided a mechanism for domestic officials and PAHO staff to assess the extent to which core elements of the EPI modules and related programmatic norms were being maintained as training materials were adapted to suit different local contexts.

For domestic actors involved in the evaluations the information generated could be used to support the ongoing adaptation of EPI efforts at both the national and subnational levels in

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order to make programs more effective. Moreover, the EPI evaluations were the first real mechanism through which program adaptation and implementation at both national and subnational levels could be examined. A key aspect of the evaluations involved preparing a list of recommendations and a timetable for their completion thereby integrating evaluation information into national immunization policies. Subsequent follow-up evaluations provided an opportunity for both domestic and external actors to assess, “the degree of implementation of previous plans of work.”

Domestic public health official’s commitment to the evaluation process is also evident in the number of follow-up evaluations solicited by domestic public health officials during the early 1980s. Between November of 1980 when the first multi-disciplinary EPI evaluation was carried out in Colombia, and the end of 1984, 18 countries had conducted national EPI program evaluations in collaboration with PAHO. Six countries had conducted a follow-up evaluation to assess progress made in implementing the recommendations and plans of action established during initial evaluations. Colombia had already carried out two additional follow-up evaluations in 1982 and 1984 and Bolivia and Ecuador had a third follow-up evaluation planned for 1985. Four other countries had second evaluations planned for 1985 and four more had scheduled their first evaluation for 1985.

Chapter Conclusion

The story that emerges in examining the development and diffusion of the Expanded Program on Immunization in the Americas and interviewing key actors involved is one of extraordinary

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91 "Annual Report of the Director, 1982," 45.; My analysis of 24 domestic EPI evaluations conducted during the early 1980s and subsequent program adaptations made in the countries evaluated indicates that domestic public health officials, by and large, acted on the recommendations made during the evaluations.

leadership, unparalleled collective action, and organizational innovativeness both within PAHO and within PAHO Member Nations. It is also a story of a finely tuned balance between centralized and decentralized diffusion systems and the emergence of an effective hybrid model. The key factors explaining the development, diffusion, and implementation of the EPI and polio campaigns can be summarized as follows.

First, they were user-driven and based on domestic capacity weaknesses that had constrained previous implementation attempts. Second, domestic actors were involved in every stage of the development and diffusion process with innovations coming from domestic actors and experiences and participation facilitated and often coordinated by PAHO. Third, adaptation was encouraged and facilitated so that programs were better suited to domestic conditions at both national and subnational levels. Fourth, collective innovation decisions regarding polio and the EPI made by PAHO Member Nations resulted in the creation of new mechanisms that helped ensure implementation and institutionalization.

Everett Rogers writes, “One important factor in explaining the degree to which an innovation is sustained by an organization is participation, defined as the degree to which members of an organization are involved in the innovation process. If many of an organization’s members participate in designing, discussing, and implementing an innovation, its sustainability over time is more likely.”93 PAHO Members were actively involved throughout the entire development of the EPI in a variety of different ways at regional, national, and subnational levels. Moreover, the EPI was developed entirely in response to the needs of Member Nations and the myriad implementation constraints cited throughout the previous decades that had obstructed immunization programs in countries throughout the region.

93 Rogers, *Diffusion of Innovations*, 429.
The wave of innovation diffusion in the Americas linked to the EPI was so dramatic and rapid it is hard to identify a clear sequence for many of the individual country adoption and implementation decisions taken during the late 1970s and early 1980s. Country decisions and actions were frequently separated from those taken in others countries by a matter of days. Ciro de Quadros’ explanation for this explosive diffusion is that the EPI was the product of “collective action at its best” and was entirely driven by country needs and interests. He suggests that there was little convincing to be done in terms of gaining support from domestic health officials, explaining that the EPI was something countries already wanted and simply didn’t have all the required capacity to do on their own in the absence of coordinated assistance from PAHO. Countries wanted to improve immunization coverage, but in many cases simply didn’t have the resources, support, or the experience needed to do so. De Quadros explains that what PAHO did was to coordinate different initiatives and collaborate with domestic governments to develop common strategies that could be used to mitigate implementation constraints in a variety of areas. He suggests that virtually everything about the EPI was driven by PAHO Member Nations and generated through collaboration.

In contrast to previous disease-specific technical cooperation provided by PAHO to combat vaccine preventable diseases such as smallpox or polio, part of the genius of the EPI was that it had something for everyone. Countries such as Uruguay, Cuba, and Chile that had already effectively controlled polio by the time the EPI was launched were still invested in the EPI because it addressed a much broader range of domestic actor needs and wasn’t limited to any single disease or issue. For example, even in Cuba, a country with one of the hemisphere’s oldest and most well developed national immunization systems established in 1962, the EPI was still significant for advancing and sustaining the progress made in Cuba prior to the EPI’s launch.
After a 1981 evaluation, PAHO collaborated with Cuban public health officials to identify possible sources of funding for additional cold chain materials, introduce a new vaccine into Cuba’s national immunization schedule, and organize Cuba’s first national EPI training workshop. This is just one example that illustrates how the EPI was beneficial to countries throughout the region regardless of the state of development of their immunization program or broader health system.

In addition to the importance of “user needs” in driving the diffusion process, another key difference between centralized and decentralized diffusion models concerns the sources and origins of innovations and new information. As discussed in chapter two, the sources of innovations and new information concerning the live oral polio vaccine, were influential in driving cross-national diffusion of the vaccine in the Americas during the late 1950s and early 1960s. Latin American actors were actively involved in generating research related to live poliovirus vaccines and their practical application, and public health officials in developing countries frequently cited one another’s experiences with the live vaccines as well as the experiences in countries like the Soviet Union, as having influenced their adoption decisions. A similar south-south pattern of policy learning and innovation diffusion is apparent throughout the 1980s related to the polio eradication and accelerated EPI campaigns in the Americas.

Latin American immunization experts and public health officials from the Americas were actively involved in creating the EPI’s training materials and modules prior to the launch of the EPI training program in the region in 1978. The contents were based on needs identified by potential adopters as well as previous domestic experiences related to immunization in the region. Latin American public health officials didn’t look to more advanced industrialized countries to emulate their policy models when it came to immunization, instead, Latin American

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public health officials increasingly looked to one another as well as their own domestic public health experiences, to inform domestic policy decisions. One of the key centralized functions provided by PAHO in this regard was facilitating cross-national exchanges, the observation of near-peer experiences, and circulation of information and innovations. This was an essential component of the EPI that was clearly articulated from the program’s inception.

Another key aspect of the regional polio and EPI campaign was the amount of reinvention or adaptation that occurred throughout the diffusion process. Countries borrowed different pieces of programs developed in other similarly situated countries in the region while also adapting external models to better suit domestic conditions and local contexts. According to Everett Rogers, centralized diffusion systems are characterized by minimal innovation reinvention during the diffusion process, whereas reinvention is a key aspect of decentralized diffusion systems. From the very beginning of the regional polio campaign, domestic public health officials were actively encouraged to adapt and adjust the core elements of the polio eradication model as needed. There were basic guidelines established by PAHO’s Technical Advisory Group (TAG), but beyond those guidelines and basic programmatic norms agreed upon by PAHO Member Nations concurrent with the launch of the regional campaign, domestic public health officials had significant leeway to develop programs as they saw fit and as domestic conditions called for. Additionally, domestic public health officials frequently adapted the basic polio campaign elements for use in other public health programs. For example, Brazil adapted national immunization days in order to collect information on nutritional status of young children to provide data for other maternal and child health programs. Mexico adapted NIDs to distribute oral rehydration therapy and vitamin A supplements. These domestic adaptations and the
Legacies left as a result are discussed in greater detail in the Brazilian and Mexican case studies in the following chapter.

Lastly, the EPI helped to generate another, arguably less tangible, benefit that contributed to strengthening immunization programs in the region and ultimately helped make the eradication of polio possible. It helped to establish a sort of “governing the commons” effect whereby PAHO Member Nations made a series of collective innovation decisions that established the basis for subsequent actions. As part of these collective innovation decisions each Member Nation committed to participating in regional EPI meetings, allowing EPI managers from other countries to provide feedback on their immunization plans and participate in evaluations of their progress, and to reporting and sharing information on their own programs in a timely and accurate manner. Additionally, by participating in the PAHO Revolving Fund, every country in Latin America committed to prioritizing domestic immunization programs by appointing national EPI program managers, establishing annual vaccination coverage targets, submitting annual immunization plans, and establishing a specific line item within national budgets devoted to covering the costs of immunization services.

In addition to these more formal commitments made among PAHO Member Nations, the EPI also contributed to establishing a sort of regional code of conduct and guiding ethos among Member Nations. On the thirtieth anniversary of the EPI Newsletter, founding editor Ciro de Quadros wrote that, “It [the Newsletter] has also served as a forum for the discussion of issues and ideas that helped improve the quality national programs, as well as created an ‘esprit de corps’ or group morale, among those involved with the program.”95 The notion of a “group morale” associated with the EPI is something that de Quadros and others associated with the program, especially during the late 1970s and throughout the 1980s, make frequent reference to.

95 Ciro de Quadros, “30 Years of the EPI Newsletter,” http://new.paho.org
The EPI was the only program at PAHO where the national program officials met every single year. De Quadros recalls that during his tenure as the program’s director, when EPI managers were in town (Washington, DC) they would all squeeze in to his office for brown bag lunches to sit around and discuss what was going on in their respective countries and with the EPI more generally. De Quadros explains how when he published the very first issue of the EPI Newsletter in May of 1979, he published the names of all the EPI managers for every country in the Americas (he lists them all by name). He says that these people went on to become a “sort of family” and that he was frequently in touch with each of the EPI managers throughout the years. He explains through these meetings both formal and informal the EPI developed “a sort of ‘esprit de corps’ everybody together…it was like collective action.” Collective action is a term that comes up frequently when Ciro de Quadros talks about the EPI. In his mind it is the best and most accurate way to describe how one of the most dramatic successes in the history of international public health was achieved.

The following chapter examines how changes in domestic capacity, including, but not limited to those facilitated by the EPI, as well as changing domestic conditions, influenced the development, implementation, and institutionalization of polio and EPI initiatives in Brazil and Mexico between 1980 and 1994.

90 Author interview with Ciro de Quadros, May 18, 2012.
CHAPTER 6
INTENDED CONSEQUENCES: POLIO ERADICATION AS A VEHICLE FOR THE EXPANDED PROGRAM ON IMMUNIZATION, BRAZIL & MEXICO, 1980-1994

“Consequences are the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation. Invention and diffusion are but means to an ultimate end: the consequences of adoption of an innovation.”

--Everett Rogers, Diffusion of Innovations

In December of 1984, Brazilian national Dr. Carlyle Guerra de Macedo called EPI director Ciro de Quadros into his office to join a meeting with UNICEF Executive Director Jim Grant. The topic of discussion for their meeting was grim: in spite of the progress made by the Expanded Program on Immunization, there were 11 million children born each year in the Americas, and 4 million of them still had no access to immunization. Efforts to improve immunization coverage as part of broader efforts to expand access to basic health care services appeared to be stalling in many countries, with coverage at an all time, but still wholly inadequate, high throughout the region. “Be straight with me, Carlyle,” Grant said. “Can the goal of universal childhood immunization by 1990 be reached in the Americas?” De Quadros recalled Director Macedo turning to him and asking, “Ciro, what is your opinion?” De Quadros sat with both men watching him, waiting for his response. “It’s possible,” he stated. “If we had a ‘banner disease,’ something that would gain the public’s attention and rally support for the program, it could be a great success.” De Quadros was “secretly thrilled” at the opportunity, and suggested, “We could start with polio.”

Several months later, on May 14, 1985, PAHO Director Macedo announced a regional campaign to eradicate polio in the Americas by the year 1990. The objective outlined by Macedo

1 Rogers, Diffusion of Innovations, KL7584-85.
2 Carlyle Guerra de Macedo replaced Héctor Acuña as PAHO director in February of 1983.
and unanimously endorsed by PAHO Member Nations in 1985 was to use polio eradication as a vehicle to mobilize resources and support for and strengthen the EPI in countries throughout the region. Ultimately, the region of the Americas became the first region in the world to effectively eliminate polio with the last case of paralytic polio caused by a wild poliovirus reported in Peru on August 23, 1991. During the 1990s countries throughout Latin America also succeeded in dramatically raising immunization coverage for all EPI diseases, establishing a regional laboratory network, developing the most comprehensive regional disease surveillance system in the world, effectively mobilizing hundreds of thousands of volunteers to support immunization initiatives, increasing national ownership over immunization programs and financing, and establishing the foundations for subsequent regional programs to combat cholera, eliminate measles, and improve overall health outcomes for children throughout the Americas.

Chapter six uses the polio eradication initiative in the Americas to examine the different ways in which institutional capacity developments at both national and regional levels during the 1970s and associated with the Expanded Program on Immunization (EPI) helped to establish the foundation for the successful polio eradication initiative in the Americas in the 1980s. Chapter six uses case studies from Brazil and Mexico to examine how changes in domestic capacity associated with previous implementation episodes and the development of the EPI in the region influenced polio immunization initiatives developed in both countries during the 1980s. In both Brazil and Mexico, national polio campaigns were launched in the early 1980s, however they were developed in different ways due to a series of different domestic contextual factors discussed in previous chapters. Throughout the course of the case studies, I examine how variations in domestic conditions discussed in previous case-study chapters continued to influence the ways in which immunization programs were adapted, implemented, and
institutionalized in both countries. The case studies in this chapter demonstrate that institutional legacies generated by polio initiatives during the 1980s were heavily influenced by domestic conditions and the ways in which the initiatives were adapted and implemented in both countries as a result.

This chapter begins with a regional overview outlining the dominant public health debates in the region during the 1980s that influenced the way in which the polio campaign was developed. In addition to policy learning within domestic policy processes, policy learning at the regional level within PAHO linked to the smallpox eradication program influenced the subsequent development and design of the regional polio campaign. This section is followed by a summary of the key changes in domestic and regional capacity associated with the Expanded Program on Immunization that provided the foundation for the regional polio campaign. The country case studies examine the evolution of polio initiatives in Brazil and Mexico throughout the 1980s and the ways in which domestic conditions influenced cross-national variation in the ways in which the campaigns were adapted and implemented, and the institutional legacies left as a result.

**Vertical vs. Horizontal: Policy Debates in the Early 1980s**

In the early 1980s PAHO’s EPI Director Ciro de Quadros began discussing polio eradication as a sort of “banner” cause that could help mobilize additional support and resources for the Expanded Program on Immunization in countries throughout the Americas. However, due to the existing climate within the global health community during the late 1970s and early 1980s, mobilizing support for polio eradication or any other issue-specific initiative, was not easy. Support for large-scale multi-country eradication initiatives had reached a peak in the aftermath
of World War II, thanks to key advocates like PASB Director Fred Soper. However, as discussed in chapters three and four, by the mid-1960s support for eradication or other targeted programs had already begun tapering off. Part of the declining enthusiasm was due to the dramatic failure of the global malaria eradication campaign and its subsequent abandonment in 1969. Maggie Black writes that the malaria campaign “had given military-style disease campaigns a thoroughly bad name.”

The global smallpox eradication program (SEP), launched under the auspices of the WHO in the mid-1960s, was launched at an inauspicious time. According to Black, the SEP was “a last gasp of the disease campaign era.”

The year 1977 served as a sort of critical juncture within the global health community. That year the last case of smallpox was reported in Somalia making smallpox the first and only disease in global health history to be successfully eradicated. Also in 1977, the World Health Assembly adopted a resolution calling for “health for all by the year 2000.” In September of the following year the International Conference on Primary Health Care (PHC) was held in Alma-Ata in the Soviet Union and attended by an estimated 3,000 delegates from 134 countries and 67 international organizations and NGOs. The final declaration on primary health care or “PHC” (discussed in the previous chapter) was approved with enormous support and endorsed by the WHO the following year.

However, as Nancy Leys Stepan writes, “If PHC was easy to vote for, it was not so easy to make a reality.” The Declaration of Alma-Ata was extremely broad in scope, yet did not include substantive guidelines or policy recommendations about how to operationalize the objectives set forth in the declaration. Much like the “ten-year health plans” drafted and

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5 Suzanne Schneider, *Mexican Community and Health and the Politics of Health Reform* (University of New Mexico Press, 2010), 34.
6 Ibid.
8 Ibid.
approved in the Americas for the 1960s and 1970s, the declaration established a range of widely agreed upon ideals that were not reflective of institutional and situational realities in many developing countries worldwide. Leys Stepan writes that the decades following Alma-Ata were “decades of disappointment and setbacks” for primary health care in developing countries.

In some ways, the difficulties experienced within the primary health care movement created a window of opportunity for polio eradication and the EPI in the Americas. However, in order to take advantage of that window of opportunity, key advocates such as Ciro de Quadros and UNICEF Executive Director Jim Grant had to overcome the eradication backlash and win over a range of formidable opponents including senior leadership within the WHO.

In 1980, the year when the global eradication of smallpox was certified, WHO Director General Halfdan Mahler stated, “Important lessons can be learned from smallpox eradication - but the idea that we should single out other diseases for worldwide eradication is not among them. That idea is tempting but illusory.” Even D.A. Henderson who directed the WHO’s global smallpox eradication program had his doubts. Speaking before an international conference on eradication in 1980, Henderson suggested that the only thing public health officials should focus on eradicating next was the very notion of eradication itself. Henderson recalled that after this somewhat surprising revelation he was not invited back to subsequent gatherings of eradicationists.

When Ciro de Quadros first approached D.A. Henderson (his former boss at the global smallpox program) with the idea of polio eradication in 1981, Henderson’s response had been quick and decisive: “No way!” However, Ciro de Quadros wasn’t deterred. He consistently argued that the problem wasn’t with eradication initiatives in and of themselves, but how

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10 Author interview with Donald A. Henderson, April 27, 2012.
eradication programs had previously been developed and implemented. In order to mobilize support for the polio eradication campaign in the early 1980s, de Quadros, had to convince potential allies within the global health community and domestic public health officials, that the polio campaign would be different from the smallpox campaign in virtually every aspect except one: the disease would be eliminated. However, the polio campaign would not simply be focused on the end goal of eradication, the polio campaign would place priority on the means used to achieve that goal and the institutional legacies produced in the process and left as a result.

An opportunity to mobilize support within the regional community of experts associated with the EPI came at the end of September of 1983. After hearing a report on the EPI, the PAHO Directing Council passed resolution CD29.R16 that stated that, in spite of improvements in domestic EPI programs, more accelerated progress was needed in order to reach the 1990 immunization coverage targets established by Member Nations. The Directing Council “urged” countries to take a range of actions intended to strengthen domestic EPI programs and further expand immunization coverage in the region.11

The 1983 Directing Council resolution was the primary topic discussed the following year at the National EPI Program Manager’s meeting held in Lima, Peru from March 5-9, 1984. The meeting included 68 national EPI staff from 20 countries. The meeting served as a forum for establishing what Shiffman and Smith explain as “internal frames” or “the degree to which the policy community agrees on the definition of, causes of, and solutions to the problem.”12 The 1983 resolution demonstrated that there was a clear need among Member Nations related to the EPI. While meeting with his fellow EPI leaders in 1984, Ciro de Quadros suggested that this

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need could be addressed by using polio eradication as a vehicle to support the acceleration of the EPI in the Americas to reach the goal of providing universal childhood immunization by the year 1990. The development of the regional polio eradication initiative was driven by the needs of Latin American actors, with PAHO/the EPI serving as a facilitator.

Starting in 1984 (prior to the launch of the polio eradication campaign) PAHO materials related to the polio eradication initiative consistently stated that the first objective of the campaign was not the eradication of polio but the overall strengthening of the EPI in the region.\textsuperscript{13} Polio eradication was always listed as the second objective of the polio campaign followed by the establishment of national and regional disease surveillance systems. This specification is particularly significant in light of Everett Rogers’ discussion of the consequences of innovation diffusion. From the very beginning, the campaign was intended to have a range of positive consequences that helped generate support from all PAHO Members regardless of whether or not they still reported cases of polio. The design of the polio campaign and Ciro de Quadros’ conviction that a targeted campaign could produce broader legacies, were directly related to his experience with, and lessons learned from, the smallpox eradication campaign.

Smallpox Spillovers:
Regional Public Health Precedent, and Policy Learning

Chapters three and four examined how domestic public health precedent and policy learning influenced subsequent policy developments in Brazil and Mexico during the 1960s and early 1970s. The Mexican case highlighted the positive influence of policy learning and learning from

\textsuperscript{13} Throughout a series of 8-hours of interviews with Ciro de Quadros he was always quick to correct me when I talked about the polio eradication campaign and the EPI as two separate initiatives. He argued that the integration of the two was the most essential aspect of the regional campaign that contributed to its success and that other global initiatives have not paid sufficient attention to.
both previous domestic experiences as well as external policy models had on Mexican immunization programs during the 1960s and early 1970s. In contrast, Brazil’s failure to learn was cited as a major constraint that negatively affected domestic polio initiatives during the early 1970s. This section demonstrates that learning from previous experience (especially from the global smallpox eradication campaign) was similarly significant at the regional level within PAHO in shaping the development and diffusion of the regional polio eradication campaign.

In 1973 the Americas became the first region in the world to successfully eliminate smallpox, with the last case in the hemisphere reported in Brazil in 1971. In some ways, the successful smallpox eradication experience generated support and established a precedent for the subsequent polio eradication campaign. For example in 1971 when the PAHO Directing Council passed a resolution calling for a regional polio control program, PAHO reports frequently evoked the smallpox precedent as proof of the possible. However, Celine Gounder argues that in some ways the global smallpox eradication program (SEP), “did more to reinforce negative ideas about targeted programs than to demonstrate how such programs could also contribute to sustainable development of health infrastructure.”

According to Ciro de Quadros:

In many countries where smallpox was eradicated it was not done through the health services. You would go, employ vaccinators, and eradicate smallpox. Often vaccinators were not from the health services, so they went back to doing whatever they did before. It was not building infrastructure.

There was very little done in most cases to train local health officials or encourage domestic ownership over programs, leading people like Dr. Mike McQuestion of the Sabin Vaccine Institute to describe to the SEP as a sort of “mercenary” effort whereby the campaign was largely imposed on developing countries in a top-down fashion that had little to do with the

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15 Ciro de Quadros quoted in ibid., 214.
needs of recipient communities. Additionally, there are conflicting opinions concerning the extent to which the smallpox campaign was designed to have positive spillover effects beyond the end goal of eradication, with the one standout exception of building disease surveillance systems, and even this was not clearly an intention of the SEP from the beginning.

However, advocates like Ciro de Quadros consistently argued that the problem wasn’t with eradication initiatives in and of themselves, but how eradication programs were developed and implemented. De Quadros explained, “There is no question that the use of categorical programs, if they are well and intentionally tuned to favor the strengthening of health infrastructure, will do it.” Based on De Quadros conviction and in order to address the needs of PAHO Member Nations related to their own immunization programs, the polio campaign would not simply be focused on the end goal of eradication, but would place priority on the means used to achieve that goal and the institutional legacies produced in the process and left as a result. Moreover, the polio campaign would be driven by domestic actors and rely on Latin American innovations and institutions, using the various mechanisms and precedents established by the EPI at regional and national levels as its foundation.

There is a crucial piece of the smallpox eradication story in the region of the Americas that is all but invisible in many accounts of the global eradication campaign, and that is particularly salient for the regional polio campaign in the mid-1980s. This crucial piece concerns the domestic innovations, initiatives, and achievements that preceded both the polio and smallpox eradication campaigns in the region of the Americas, and upon which both of the campaigns were based. By 1967 when the WHO launched the intensified global smallpox eradication program (SEP), the smallpox eradication campaign within the Americas had already

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16 Author interview with Mike McQuestion, May 25, 2012.
17 De Quadros is quoted in Gounder, "The Progress of the Polio Eradication Initiative: What Prospects for Eradicating Measles?" 223.
been underway for 17 years having been launched under PASB director Fred Soper in 1950. Moreover, by 1967 Brazil was the only country in the Americas where smallpox remained endemic. Every other country in Latin America and the Caribbean had effectively controlled and eliminated smallpox through a variety of domestic immunization initiatives, some of which dated back nearly 150 years to when the smallpox vaccine first became available in the Americas in 1804–1805.\(^\text{18}\) Indeed, Brazil was among the first countries in the Americas to launch mass vaccination campaigns to combat smallpox in the 1800s and passed mandatory smallpox vaccination laws as early as 1832.\(^\text{19}\) However, for myriad reasons similar to those constraining polio immunization campaigns during the 1960s and 1970s and discussed in chapters three and four, smallpox continued to be a problem in Brazil throughout the 1960s.

Brazil, however, was the exception in Latin America and not the rule. Seven Latin American and Caribbean countries eliminated smallpox through domestic vaccination initiatives during the 1920s and 1930s.\(^\text{20}\) After a new and more effective vaccine was introduced in the region, eight more reported their last cases of smallpox in the 1950s.\(^\text{21}\) Five countries (all bordering Brazil) stepped up domestic vaccination efforts with support from PAHO in the early 1960s and successfully eliminated domestic transmission by the time the WHO launched the SEP in 1967, leaving Brazil as the outlier in the region.\(^\text{22}\)


\(^{19}\) Hochman, "Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda," 232.

\(^{20}\) El Salvador (1938), Nicaragua (1924), Panama (1922), Suriname (1920), Belize (1939), Costa Rica (1920), and Cuba (1923).

\(^{21}\) Guatemala (1951), Mexico (1951), Guyana (1951), Honduras (1952), Uruguay (1957), Venezuela (1956), Chile (1954), and Peru (1954) - however Peru was re-infected through imported cases from Brazil in 1966.

\(^{22}\) Bolivia (1960), Colombia (1965), Argentina (1966), Paraguay (1960), and Ecuador (1963).
The domestic initiatives and domestic capacity development that made the regional eradication of smallpox possible in the Americas have too frequently been overlooked by global health scholars and policymakers alike, which I would argue has distorted the lessons drawn from the campaign as a result. When the significant progress already achieved by domestic actors, based largely on domestic conditions and capacities, is ignored, the lesson drawn from the eradication of smallpox is overly focused on the effect of global initiatives and international organizations. As Anne-Emanuelle Birn writes:

Indeed, it might be argued that smallpox was still killing two million people per year in the 1960s ‘not because’ the world lacked a global eradication program ‘but because’ existing effective measures were not being sufficiently administered in settings plagued by underdevelopment, the legacies of imperialism, poverty, inequality, and inadequate health systems infrastructure.23

As in the case of the global smallpox campaign, one of the most important and frequently overlooked aspects of the unanimous decision made by PAHO Member Nations in 1985 to eradicate polio, was that on the eve of the campaign’s launch it was entirely feasible. By the time the regional campaign was launched by PAHO on May 14, 1985, there were 26 countries in Latin America and the Caribbean that had already effectively controlled polio through domestic initiatives and in the absence of a regional polio eradication campaign. A PAHO Directing Council report outlining the proposed polio program stated:

The improvements in the control of paralytic poliomyelitis in the Americas since the start of the EPI initiative have been remarkable. In the Americas, the proportion of children less than one year of age who have received the recommended three doses of polio vaccine has increased from 34.6% in 1978 to more than 75% in 1984.24

The report continued arguing that timing of the campaign’s proposed 1985 launch was “propitious” based on the fact that polio incidence was at an all time low in the region, stating

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definitively: “eradication of indigenous transmission in the Americas is feasible now.”25 The report explained that polio eradication was feasible thanks in large part to the significant domestic health system capacity developments that had taken place in countries throughout the region related to the EPI since 1977 discussed in chapter five.

Domestic Capacity Developments

As discussed in chapters three and four, domestic immunization initiatives in the region throughout the 1960s and early 1970s were constrained by myriad factors related to health system capacity and administrative capacity of national governments and Ministries of Health. More specifically, immunization programs were constrained by a combination of two key issues: weak centralized or stewardship functions provided by national Ministries of Health and weak subnational implementation capacity. As discussed in chapter five, the EPI was explicitly designed with these constraints in mind and helped strengthen domestic capacity in several key areas that can be summarized as follows.

First, the EPI facilitated the dramatic expansion of human resources for immunization programs in countries throughout the region both directly, through formal EPI workshops, and indirectly through EPI materials that were integrated into broader education and training programs. These EPI workshops were similar to Donald Schön’s “magnet model” of diffusion whereby actors from different places are brought to a central entity where they are exposed to new ideas and innovations that they then bring back to their home country or organization.26 By the end of 1984 PAHO estimated that 15,000 regional, national, and subnational staff had participated in one or more EPI training courses and workshops. In addition to formal EPI

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26 Schön, Beyond the Stable State.
workshops, EPI materials and training modules had been incorporated into medical schools and public health curricula in schools throughout the region thereby facilitating the wider diffusion of EPI norms and information to a broader range of actors.

Second, the EPI established strong regional and national communities of immunization experts that included national EPI program managers and other domestic officials with responsibility for related policymaking decisions and implementation. These regional and national networks facilitated the constant exchange of information, new innovations, and experiences among domestic actors, which increased the amount of information that was available to policymakers. Innovation-evaluation information from near-peers and stronger domestic communities of experts strengthened the adaptive capacity of domestic EPI programs. As a result, rather than simply adopting external models, public health officials in the region increasingly adapted or combined different elements of external models as well as drawing on existing domestic innovations, to better suit domestic conditions.

A Directing Council report from 1985 prior to the launch of the polio campaign noted, “An important advance in most country programs has been the identification of appropriate combinations of vaccination strategies to meet specific country needs.” 27 Throughout the duration of the regional polio campaign between 1985 and 1991, there was significant cross-national within-country variation concerning the different immunization strategies used. Variation within countries was an indicator of stronger subnational implementation capacity that had been facilitated in part through national and local EPI training initiatives and stronger technical support provided by national ministries of health. Additionally, different strategies were used at different points in time during the campaign and adjusted according to changes in domestic conditions. The range of vaccination strategies adopted included: vaccination in fixed

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health centers, house-to-house vaccination in urban areas, mini-campaigns in rural areas, national immunizations days for selected vaccines, and mobile brigades to reach remote areas.

Third, the EPI helped advance the notion of stewardship among senior public health officials in the region by establishing national governments as stewards of their own domestic immunization programs. This in turn helped strengthen stewardship functions provided by national ministries of health and other related institutions in a number of key ways. National immunization officials were appointed within ministries of health to coordinate and provide leadership for immunization programs nationwide. EPI managers were responsible for working with relevant government agencies and actors to develop comprehensive multi-year immunization plans that provided basic programmatic guidelines and targets for subnational authorities as well. EPI managers received technical support from EPI managers in other countries as well as PAHO EPI staff. Additionally, as a result of membership requirements to participate in the EPI Revolving Fund, national governments were required to establish a budget specifically devoted to covering EPI costs. Domestic capacity developments and changing domestic conditions that influenced the development, implementation, and institutionalization of the EPI and polio efforts are discussed in greater detail in the Brazilian and Mexican case studies later in this chapter.

PAHO’s Institutional Capacity
In addition to significant improvements in domestic capacity among PAHO Member Nations, the success of the regional campaign was also facilitated by improvements in PAHO’s institutional capacity. PAHO’s coordinating mechanisms were an area where some of the most dramatic and influential evolution occurred. Examples discussed in chapter five that illustrate this point
include the establishment of the EPI Revolving Fund in 1977 (operational in 1979), the internal monitoring and evaluation mechanisms introduced by Héctor Acuña in 1976 intended to improve PAHO’s technical cooperation, and the step-wise training and coordination of the EPI training program throughout the region between 1979-1983. Two additional coordinating bodies, the Technical Advisory Group (TAG) and the Interagency Coordinating Committee (ICC), were created in 1985 pursuant to the launch of the regional initiative. Both the TAG and the ICC provided essential centralized functions to PAHO Member Nations that facilitated more effective and sustainable program adaptation and implementation in various ways as will be discussed briefly in the following sections.

Pursuant to the launch of the regional polio eradication and accelerated EPI campaigns in 1985, PAHO established a Technical Advisory Group (TAG) made up of immunization and surveillance experts from different countries in the region. The primary functions of the TAG included: (1) guiding the implementation of the Regional Plan of Action; (2) advising PAHO and Member Nations on technical elements related to the program; (3) assisting in identifying research needs related to the program and oversee progress on research studies; (4) regularly reviewing program progress at both national and regional levels. The TAG was scheduled to meet roughly twice a year to review progress and problems within the campaign and make recommendations to overcome implementation constraints that emerged during different phases of the program’s evolution.

One of the critical functions provided by the TAG was to create guidelines and recommendations concerning program adaptation, implementation, and sustainability, to countries throughout the region and also to PAHO/EPI staff. The basic objective was to provide sufficient information and guidance to domestic actors so that programs could be effectively
adapted to best suit a variety of local conditions and meet the needs of local communities. This sort of “guided adaptation” was a key aspect the emerging hybrid diffusion model.

As discussed in chapter five, adaptation was actively encouraged and facilitated by PAHO staff and national health officials throughout the course of the EPI’s development to increase domestic ownership over innovations, ensure that innovations fit local needs and contexts, and improve the likelihood that innovations would be sustainable. The *EPI Newsletter* explained, “A strength of the EPI lies in that it is not confined to the use of a single delivery tactic or to a repetitive description of coverage gains, but focuses attention on sociocultural, economic and political conditions, with a view to the application of new and more realistic tactics for the benefit of vulnerable and neglected population groups.”28 A 1985 Progress Report on the EPI prepared during the first meeting of the TAG noted, “An important advance in most country programs has been the identification of appropriate combinations of vaccination strategies to meet specific country needs.”29 The TAG report recognized that improvements in domestic health system capacity - specifically larger communities of experts, increased information circulation, stewardship functions within health ministries, and implementation capacity at local levels - had facilitated greater domestic adaptive capacity. The range of vaccination strategies adopted included: vaccination in fixed health centers, house-to-house vaccination in urban areas, mini-campaigns in rural areas, national immunizations days for selected vaccines, and mobile brigades to reach remote areas.

Based on the progress demonstrated by national EPI programs, PAHO’s Plan of Action for the polio eradication campaign stated, “The vaccination tactics recommended to achieve the goal will vary depending upon each country’s level of poliomyelitis activity, existing vaccination

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coverage and health infrastructure.” Adaptation was encouraged within clearly defined boundaries elaborated in technical guidelines and programmatic norms that were established through collaborative processes involving domestic health officials, technical experts, and PAHO staff (based on the processes used within the EPI discussed in the previous chapter).

The provision of overarching technical guidelines and programmatic norms was one of the key centralized functions provided by PAHO and the TAG during this period. It was also one of the most significant demonstrations of PAHO’s strengthened stewardship role and more clearly articulated responsibilities relative to Member Nations. One of the primary constraints impeding progress in immunization efforts at both the national and regional levels during the 1960s and 1970s, was the lack of clearly articulated programmatic norms and consistent technical guidelines for domestic policymakers to follow in designing and implementing their own immunization initiatives. This was also a major weakness within national ministries of health and planning bodies in the region during the 1960s and 1970s and similarly constrained effective subnational program adaptation and implementation.

A second guiding institution created and coordinated by PAHO linked to the launch of the regional campaign was the Interagency Coordinating Committee (ICC). The ICC was established to coordinate the involvement and contributions of external actors who were supporting the regional initiative. This was extremely significant in light of the existing economic crisis severely limiting the availability of domestic resources for public health and social services. At the end of 1985 PAHO reported that, “The worldwide economic crisis has affected the countries in the Third World, especially those in the Region of the Americas,

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relentlessly and almost discriminately.” In spite of this fact, PAHO Member Nations agreed to contribute additional domestic resources to support the regional polio and EPI campaign.

When PAHO Director Macedo first announced the proposal for the regional campaign in May of 1985, it was estimated that the program would cost roughly $110 million dollars over the course of the next five years. In his speech announcing the campaign, Macedo stated, “I am convinced that this commitment by the nations of the Americas to eradicate polio will not fail because of the lack of financial resources.” Macedo noted that external resources would cover only one-third of the total cost of the campaign, explaining that, “The remainder will come from the countries themselves, in spite of the financial crisis which currently pervades this Region. For most of them, it will mean the programming and more efficient utilization of resources which are already being spent in health.” Ultimately the campaign in the Americas cost an estimated $540 million between 1985 and 1994. In spite of this nearly five-fold increase, PAHO Member Nations still covered 80% of the total costs of the campaign, relying on donor contributions for the remaining 20%.

In order to coordinate the efforts and contributions made by different donor agencies and international organizations, PAHO’s Plan of Action called for the creation of a Regional Interagency Coordinating Committee (ICC). The official representatives on the Regional ICC included: USAID, UNICEF, the Inter-American Development Bank (IDB), Rotary International, and the Bellagio Taskforce for Child Survival that represented major donors including the Rockefeller Foundation and the World Bank. The establishment of the ICC was created to address broader concerns expressed by PAHO and its Member Nations related to the current

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33 (WHO), Polio: The Beginning of the End, 54.
economic crisis in the region and the state of international “aid” and external funding for health and development in the mid-1980s.

PAHO’s *Quadrennial Report* at the end of 1985 stated, “The international cooperation systems have displayed an inability to act and adjust to meet changing needs and the Governments’ requirements.” One of the main causes cited was conflicting interests between donor agencies and a lack of cooperation with other actors doing similar work. “Donor countries tend to provide resources directly and in a way that reflects their own national interests,” claimed the Report, which lead to a second criticism concerning the politicization of donor agencies and contingent provisions of aid. Based on the aforementioned concerns, the mission of the ICC was to ensure that donors coordinated their efforts at the national-level under the auspices of national ministries of health, to ensure that resources were used most effectively and in support of national health priorities and development. In sum, the ICC was created to ensure that the regional campaign addressed the needs of Member Nations and was guided by Member Nations and domestic public health officials rather than external actors.

**Country Case Study Brazil: The Emergence of New Policy Model**

After abandoning the National Polio Control Program in 1974, throughout the second half of the 1970s Brazil continued to experience severe polio outbreaks. By the end of the 1970s Brazil was responsible for the vast majority of all polio cases reported in the Western Hemisphere. Finally, a

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severe outbreak in December of 1979 prompted a nationwide response from the Brazilian Ministry of Health. On June 14, 1980, Brazilian public health officials launched the largest mass immunization campaign to combat polio in public health history. Over 300,000 people, primarily volunteers, manned 90,000 vaccination posts and health facilities, and succeeded in vaccinating 17.5 million Brazilian children in a single day.\textsuperscript{35}

In order to appreciate the magnitude of the Brazilian accomplishment and why the demonstration effect produced was so dramatic both domestically and internationally, it is important to place it in the context of previous polio campaigns that had been carried out prior to 1980 in countries worldwide. In Cuba, where National Immunization Days (NIDs) had first been implemented, polio was successfully eliminated within a single year of the campaign’s launch in 1962. Between 1962 and 1996 Cuba successfully carried out 35 rounds of NIDs and administered a total of 64 million doses of the oral polio vaccine.\textsuperscript{36} In contrast, the Brazilian government purchased 60 million OPV doses in 1980 alone, vaccinating the equivalent of two times the entire population of Cuba in 1962, in a single day. The population of Brazil in 1980 was roughly 119 million, or 17 times the size of Cuba’s population in the early 1960s, with the Brazilian population dispersed over a territory that was, in terms of square millage, 77 times as large as Cuba’s.

In the Soviet Union, where mass campaigns using the OPV originated in the late 1950s, an unprecedented 15.2 million children were vaccinated in 1959.\textsuperscript{37} While having an extremely large population and territory to cover, the Soviet Union had a highly developed healthcare system, extensive surveillance and monitoring capacities, domestic vaccine production facilities

\textsuperscript{35} Risi Jr, "Poliomyelitis in Brazil," 173.
\textsuperscript{36} Mas Lago, "Eradication of Polio in Cuba: A Historical Perspective," 681-87.
so that all polio vaccines used in national campaigns were produced domestically, mass
organizations and a highly mobilized society, an extremely strong state with the capacity to
enforce and implement policy, and routine health services reaching the majority of the
population.  

In 1980 Brazil had no domestic vaccine production facilities and had to import all
vaccines used during the campaign, an extremely fragmented and inequitable public health
system as discussed in previous chapters, a brand new and largely untested surveillance system, a
weak state with minimal enforcement capacity and declining legitimacy, highly unequal access
to routine health services, and millions of people living in areas of the country that had never
been reached by previous immunization efforts. In spite of these formidable constraints, Brazil
succeeded in vaccinating 2.3 million more children in a single day than the Soviet Union had
vaccinated in an entire year in 1959. These comparisons should it no way trivialize the
innovativeness or the extraordinary achievements of Brazil’s predecessors, they are meant
simply to illustrate the enormity of Brazil’s accomplishment and help explain the dramatic break
from the past that occurred in Brazil in order to make this accomplishment possible.

After the first round of NIDs launched in 1980, similarly successful NIDs were
subsequently carried out twice a year. By 1983 Brazil registered only 45 cases of polio, the
lowest number in Brazilian history. Brazil used highly targeted nationwide mass immunization
campaigns to achieve what more decentralized routine immunization services could not,
dramatically breaking with previous domestic strategies as well as existing strategies promoted
within the WHO. According to D.A. Henderson, “Traditionalists at WHO’s Geneva headquarters
were severely critical of this approach, but, as Brazil had discovered, when vaccination was left

38 Ibid.
to health centers and the private sector, it was difficult to attain a coverage higher than about 50 percent. The poor performance of existing strategies had created a window of opportunity for a new policy model.

In his work on social policy diffusion Kurt Weyland suggests that the emergence of a new policy model or innovation is usually preceded by “general shifts in policy paradigms” and “increasing levels of confusion and uncertainty” where “established policy approaches appear as ineffective, insufficient, and ever less successful.” Weyland explains that, “Under these circumstances, a bold new proposal that rejects the existing policy schemes and introduces an innovative idea - derived from a broader paradigm shift - can emerge as a solution to these vexing, intractable difficulties.” Everett Rogers argues that for potential adopters or observers, the perceived newness of an innovation or policy model is more important than the actual newness. Rogers writes, “It matters little, so far as human behavior is concerned, whether or not an ideas is objectively new as measured by the lapse of time since its first use or discovery.”

The Brazilian model wasn’t really new, in many ways it was a scaled up version of the original Cuban polio model first developed in 1962 and used in Cuba to effectively eliminate polio in the early 1960s. However, Brazil revived the Cuban model and effectively adapted and implemented it in a very dramatic and highly visible way. Speaking at a Rotary International convention in 1985, Dr. Albert Sabin stated:

I think it is our challenge to show that certain things can be achieved for poor people before economic development brings health care to all and that they can be achieved without a communist government. In 1962-1963, Cuba was the first country to start carrying out annual house-to-house vaccinations against polio on one day, twice a year,

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42 Ibid.
43 Rogers, Diffusion of Innovations, 12.
and polio was quickly eliminated and has remained eliminated for 22 years. How did Cuba do it? Cuba used Committees for the Defense of the Revolution to make lists of children under five years of age in homes and then on one Sunday, these same people would receive the vaccine, go in to the homes, administer the vaccine, and that was that. We constantly run into this business of the communists, and we have had a problem – because many people said that only communists can get organized….It was not until 1980 that Brazil, not a communist country, and with 125 million people in a geographic area practically as large as the continental United States, did what people said couldn’t be done. They got organized to bring the oral vaccine to the people.”

The new policy model guiding Brazil’s national polio campaign starting in 1980 marked a significant departure from previous campaigns and national health initiatives in a number of ways that contributed to its much more successful implementation and subsequent institutionalization. The following case study demonstrates that this significant departure was facilitated by a combination of factors related to changes in Brazil’s domestic capacity that took place during the 1970s, and a policy window created by a convergence of factors. These factors and interactions can be summarized as follows:

First, in December of 1979 there was a severe polio epidemic in wealthy southern states that was highly publicized by state health officials, the Brazilian media, and Dr. Albert Sabin, all of whom criticized the Federal Government for not having provided resources to prevent the outbreaks. This brought negative attention to the Brazilian Federal Government at a time when the government’s legitimacy was already at an all-time low. The negative attention created by the outbreak created incentives for a high profile and nationwide response from the Federal Government and a break with previous strategies.

Second, Brazil’s domestic surveillance capacity improved dramatically during the second half of the 1970s making it possible to examine the status of polio at both national and subnational levels for the first time in Brazil’s history. The availability of new evidence indicated significant subnational inequality concerning immunization coverage. The outbreak and the

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44 Albert Sabin speaking before the Rotary International Convention, 1985.
newly available credible indicators on immunization coverage demonstrated that existing strategies (and previous strategies adopted during previous implementation episodes) were inadequate, thus creating an opportunity for more feasible alternatives.

Third, a large domestic community of experts that was established by the previous smallpox campaign, the National Polio Control Program, and other public health training and research initiatives during the 1970s, including but not limited to the EPI, had greater access to the policy process thanks to changes within the Ministry of Health in the late 1970s and early 1980s. This, combined with the gradual opening of the political system linked to the democratization process begun in 1979, created new opportunities for policy learning and increased Brazil’s adaptive capacity. Additionally, Brazil domestic communities of experts were well connected to regional communities of experts and actor networks linked to PAHO and the EPI, which provided increased information and support for domestic officials.

Fourth, changes in the administrative authority and capacity of the Brazilian Ministry of Health during the second half of the 1970s and linked in part to the Expanded Program on Immunization made the launch of coordinated and truly nationwide campaign possible. Expanded authority and capacity at the central level was supported by stronger state and local level implementation and adaptive capacity, which facilitated more effective program implementation.
Between 1975 and 1979 virtually every state in Brazil experienced a polio outbreak, culminating in outbreaks in the wealthy southern states of Paraná and Santa Catarina in December of 1979. A series of events linked to the outbreak and involving Dr. Albert Sabin helped to generate a high level of political priority for polio within the Federal Ministry of Health in 1980. This high-level support helped mobilize the resources and leadership required to launch the first truly national polio campaign in Brazil’s history in June of 1980.

On January 25, 1980, Dr. Sabin received a letter from Brazilian Minister of Health Waldyr Arcoverde inviting him to come to Brazil to consult with Brazilian authorities in planning a national polio immunization campaign. It is important to note that in early January, prior to extending the invitation to Dr. Sabin, the Minister of Health had already convened a meeting of key actors including a number of NPCP and smallpox eradication veterans such as Dr. João Baptista Risi Jr. and Dr. Roberto Becker, and drafted a plan for a national polio campaign. In his invitational letter to Dr. Sabin, Minister Arcoverde stated, “I would like to underline that your visit will be of high significance for our country and would constitute a motive of happiness for the Brazilian people due to the high opinion people have of you in international scientific circles.” As discussed in chapter three, Dr. Sabin was a frequent visitor to Brazil (and was also married to a Brazilian woman, Heloïsa Dunche de Abranches as of 1973), had worked with Brazilian health authorities for almost two decades, and was well known and widely respected in the country. Dr. Risi recalled that Sabin was “welcomed with great

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enthusiasm, as we looked forward to receiving his technical advice on particular issues, and his support was necessary to insure public acceptance.”47

Dr. Sabin traveled to Brazil and was appointed as an advisor to the Ministry of Health on February 4, 1980. Dr. Lee Hampton writes, Sabin’s international reputation and prestige were viewed as a potential “public relations boost” for the Brazilian military regime and Federal Government in the midst of overlapping political, economic, and now, public health crisis.48 However, things did not go according to plan for either Sabin or the Brazilian Government. Within several weeks of his arrival a series of events unfolded that lead to Sabin’s abrupt departure and that generated a significant amount of negative press for the Brazilian government.

The primary cause of the drama was an argument between Dr. Sabin and Brazilian Ministry of Health officials concerning Brazil’s disease surveillance and reporting systems.49 Early in his visit Dr. Sabin revealed what he claimed was evidence of “gross professional negligence” on the part of Brazil’s national health authorities.50 What Sabin had discovered were major discrepancies concerning state and national polio incidence reporting between the years of 1968 (when polio first became a notifiable disease in Brazil) and 1972. This would not have been a surprise to Brazilian public health officials such as Dr. Risi or Ciro de Quadros who had direct experience with the deficiencies in Brazilian surveillance systems during the smallpox epidemic.

48 Hampton, "Albert Sabin and the Coalition to Eliminate Polio from the Americas," 36. The added benefit of Dr. Sabin’s reputation was cited when Sabin was invited to Brazil in 1958 and 1961 to consult with Brazilian public health officials.
49 Dr. Sabin had two objectives he planned to pursue while in Brazil, the first was helping to assist in the planning of Brazil’s national polio immunization program, and the second, was to advance his investigations concerning the prevalence of polio in subtropical and tropical climates by conducting a series of lameness surveys. During the 1960s and into the early 1970s there was considerable uncertainty within the global health community about the size of the polio problem in developing countries especially in tropical regions. Many experts initially viewed polio as a disease primarily of more developed and industrialized countries, as evidenced by the fact that polio vaccines were not originally included within the WHO’s EPI recommendations when they were first proposed in 1970. Dr. Sabin suspected that polio was far more common in Brazil than official estimates reported and had asked and received permission to conduct a national lameness survey to establish a more accurate assessment of Brazil’s polio problem.
eradication campaign. However, Dr. Sabin accused federal health authorities (none of whom had been in positions of power during the episode in question) of having used the discrepancies to their advantage, doctoring official statistics that were subsequently reported to the World Health Organization.\(^{51}\) Sabin warned that the continued negligence shown by Brazilian federal authorities on matters of disease surveillance “left Brazil under the permanent threat of polio epidemics.”\(^{52}\)

Newspapers throughout Brazil quickly picked up on Sabin’s criticisms and used them, in addition to the polio outbreaks, as a platform to criticize the Federal Government and federal authorities with some even calling for the resignation of Health Minister Arcoverde.\(^{53}\) Not surprisingly the Ministry of Health was not eager to continue working with Dr. Sabin and he was informed by the Brazilian government that, “his services were no longer needed.”\(^{54}\) Before leaving Brazil Sabin wrote a letter to Brazilian President João Figueiredo stating, “Brazil needs a national program of vaccination against polio, organized in a highly efficient form and conducted annually…However, this job continues being blocked by bureaucratic barriers.”\(^{55}\) Upon Sabin’s departure one of Brazil’s leading weekly magazines commented on the drama, “Our problem isn’t infantile paralysis, but adult paralysis.”\(^{56}\)

Dr. Sabin’s Brazilian adventure made similar headlines in the United States with the bylines of leading newspapers depicting Sabin as the heroic victim of Brazilian misconduct. \textit{The New York Times} reported, “Dr. Albert B. Sabin, creator of the oral polio vaccine, came to this county to help stem an epidemic of the disease but has just ended up being defeated by another

\(^{51}\) Rather than collecting municipal level data based on hospital admissions for polio as directed, Sabin claimed that at some point national authorities had simply begun aggregating state-level administrative data which was then passed on to the WHO, never indicating that a shift in reporting procedures had taken place.

\(^{52}\) Hoge, “Brazil Slams the Door on Sabin After Polio Discloser.”

\(^{53}\) Mintz, “Disillusioned Dr. Sabin Returns from Polio-Plagued Brazil.”

\(^{54}\) Hoge, “Brazil Slams the Door on Sabin After Polio Discloser.”

\(^{55}\) Ibid.

\(^{56}\) Ibid.
virulent Brazilian malady - government bureaucracy." In a statement issued upon his return to the United States on April 8, 1980, Dr. Sabin wrote, “I left Brasil because I found it impossible to continue any collaboration with the Minister of Health and his chief deputy because I found them to be untrustworthy.”

The Sabin scandal had several direct implications for Brazil’s national polio program. First, Sabin’s criticisms about Brazil’s surveillance capacity and the accuracy of data reported to international organizations, touched a nerve among Brazilian public health officials based on Brazil’s international embarrassment over falsified surveillance data a decade earlier during the smallpox eradication campaign. Brazil’s surveillance deficit had threatened to derail the global smallpox eradication campaign at the end of the 1960s. As a result, the WHO pressured Brazilian officials to accept external advisors to help establish surveillance procedures and monitor Brazil’s progress. Brazil’s longstanding inattention to surveillance and reporting had also been a significant source of tension between Brazil and other countries in Latin America. Brazil had a history of not fulfilling its obligations to PAHO or to other Member Nations when it came to reporting disease information that might be relevant to its neighbors. The Sabin scandal, Brazil’s domestic precedent, geoepidemiological factors, and the conviction of key actors such as Dr. Risi that inadequate surveillance had derailed previous polio initiatives, placed surveillance at the forefront of the Brazilian campaign starting in 1980.

A second spillover from the Sabin scandal was related to the role and responsibility of the Federal Government and the Ministry of Health. When the polio outbreaks were first reported in December of 1979, Dr. Oscar Alves, the Minister of Health for the State of Paraná, called a press

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57 Ibid.
60 Ibid.
conference to publicize the epidemic, taking the opportunity to criticize and launch accusations at the Federal Government. Dr. Risi recalled that this was, “a very unusual initiative for a government authority in Brazil at that time.”\footnote{Risi Jr, "Poliomyelitis in Brazil," 169.} Minister Alves claimed the outbreak was unacceptable given the resources available that the Federal Government could and should have mobilized to effectively prevent it.\footnote{Ibid.} Minister Alves was calling attention to the fact that the National Polio Control Program during the early 1970s had primarily been operational in states located in the North and Northeast regions of Brazil. This had been part of a broader Bismarckian strategy developed by the military regime in the early 1970s to increase its presence in the two regions where the federal government’s influence and authority were weak and where an “increasingly active rural movement” was causing problems for the regime.\footnote{Tulia G. Falleti, "Infiltrating the State: The Evolution of Health Care Reforms in Brazil, 1964-1988," in Explaining Institutional Change: Ambiguity, Agency, and Power, ed. James Mahoney and Kathleen Thelen (Cambridge University Press, 2010), 40.} As a result, the resources allocated to the NPCP only went to these select states with no similar federal resources (specifically polio vaccines) distributed to states in other regions.

During his time in Brazil, Dr. Sabin, likely without realizing it, added fuel to an already tense situation between state and federal authorities in Brazil at the time. Based on his belief that federal authorities had been negligent and after his collaborative work with state health authorities in the southern states of Goiás, Santa Catarina, and Paraná (where the outbreaks had been reported), Dr. Sabin suggested that the state authority in charge of the Santa Catarina effort should be placed in charge of the national campaign.\footnote{Hampton, "Albert Sabin and the Coalition to Eliminate Polio from the Americas," 36.} Lee Hampton writes, “Sabin thus placed himself squarely on the states’ side in their rivalry with a federal government that was acutely concerned about its public image.”\footnote{Ibid., 37.} Federal health officials were neither enthusiastic about

\begin{footnotes}
\item[61] Risi Jr, "Poliomyelitis in Brazil," 169.
\item[62] Ibid.
\item[64] Hampton, "Albert Sabin and the Coalition to Eliminate Polio from the Americas," 36.
\item[65] Ibid., 37.
\end{footnotes}
Sabin’s high-profile critique of their surveillance system nor his suggestions that a state health official should replace the federal authorities currently in charge of the campaign. Dr. Risi writes, “Dr. Sabin did not accept objections to his proposal, and he left the Ministry of Health having opened up a spectacular scene of disagreements.”\(^{66}\) It’s worth noting that almost the exact same situation occurred in the early 1960s when Dr. Sabin reportedly created “a real war” between federal and state authorities after crediting state officials rather than the Federal Ministry of Health with successfully launching the first mass immunization campaigns in 1961 (discussed in chapter three).

The tensions between state and federal authorities and the accusations made by state health officials as well as Dr. Sabin that federal authorities had been negligent served as a sort of focusing event for the federal government. Lee Hampton explains that the polio outbreaks at the end of 1979 came at a “politically and economically difficult time for the Brazilian government.” As a result, Hampton suggests, “a strong response was important for its leaders’ credibility.”\(^{67}\) The need for credibility within the Federal Government helped create support for launching a truly national campaign with strong federal government support and resources behind it. In writing about the influence that the Sabin incident had, Dr. Risi wrote, “Looking back, this troublesome episode was helpful in the sense of emphasizing the importance of poliomyelitis and the need for immediate action to be taken thus speeding up mobilization activities.”\(^{68}\)

In addition to mobilizing federal resources, the political situation in Brazil in 1980, and the tensions between state and federal actors fueled by Dr. Sabin, created a window of opportunity to mobilize state and local actors (and their resources). In 1979 the gradual political opening (known as \textit{abertura}) led to municipal elections and the decision made by the Brazilian

\(^{66}\) Risi Jr, "Poliomyelitis in Brazil," 172.
\(^{67}\) Hampton, "Albert Sabin and the Coalition to Eliminate Polio from the Americas," 36.
\(^{68}\) Risi Jr, "Poliomyelitis in Brazil," 1972-73.
Congress in 1980 to reestablish direct election of state governors for the first time since the military regime came to power in 1964. Dr. Risi and his colleagues at the Ministry of Health took advantage of the situation by framing mass immunization campaigns as an opportunity for local and state political officials. Mass campaigns were highly visible events organized in public spaces, which provided political hopefuls with the opportunity to use them to campaign and mobilize support within the community. Risi suggested this could create a sort of constructive competition among states and municipalities to see who could mobilize the most resources, turnout the greatest numbers of volunteers, vaccinate the most children, and demonstrate the most progress.

Ultimately, the drama surrounding the polio outbreaks in December of 1979 and the Sabin scandal that followed helped create a window of opportunity. The high profile outbreaks and Sabin’s involvement placed polio at the top of the Federal Government’s agenda for the first time in almost a decade. The existing political climate in Brazil and the negative attention the outbreaks generated for the Federal Government, created incentives for the Federal Government to launch a national campaign that included all states and municipalities. The political incentives were backed up by more pragmatic arguments in favor of launching a national campaign based on the failures of the previous initiatives that were national in name only. Lastly, the high profile attack on Brazil’s surveillance system made by Dr. Albert Sabin, the world’s foremost and most outspoken polio expert, combined with Brazil’s surveillance scandal during the smallpox eradication campaign, secured surveillance as a central feature of the polio campaign starting in 1980. All of these factors converged to create a window of opportunity for a national polio campaign, however it was the significant changes in Brazil’s domestic capacity that created the

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69 Elections were scheduled to take place in 1982.
conditions to effectively adapt, implement, and institutionalize a national polio campaign. These changes are examined in the following sections.

Changes in Health System Capacity: Institutional Legacies of the 1970s

As discussed in chapter four, Brazil’s National Polio Control Program during the early 1970s was constrained by a number of factors and abandoned within two years of its original launch. First, it wasn’t truly national in scope and was only ever operational in 14 out of Brazil’s 27 states. Second, it was primarily operational in poorer regions of the country where resources for continuing the program in the absence of federal support were extremely limited and local level capacity required to implement the program effectively was similarly limited. Third, the Ministry of Health did not provide adequate technical or programmatic guidelines to follow and didn’t provide adequate leadership required to expand the program beyond the initial 14 adopting states. Fourth, the program did not include active disease surveillance or program evaluation components which made it very difficult to demonstrate the impact the program was having in adopting states. This not only prevented the further spread of the program to other states based on the ability to highlight results achieved by previous adopters, but it also made it difficult to sustain momentum for the program in the 14 adopting states based on the fact that results weren’t overly visible. Lastly, without sufficient data or program evaluation information and without collaboration between policymakers and Brazil’s own domestic community of experts, it was impossible to adequately adjust programs to make them more effective and to better suit local conditions and contexts. In 1973 the NPCP was integrated into the newly launched National Immunization Program (NIP) and in 1974 the NPCP formally ceased to exist.
There were a number of key changes that took during the five-year period between when the NPCP was abandoned in 1974 and the end of the 1970s when the mass campaigns to combat polio were first discussed within the Ministry of Health in December of 1979. The key changes that took place in the second half of the 1970s included: (1) the recentralization of a number of health system under the auspices of the Ministry of Health and strengthening of the administrative capacity and authority of the national Ministry of Health relative to subnational units; (2) the development of domestic surveillance capacity within the Special Public Health Services (SESP) Foundation 1974-1979; (3) subnational health system capacity development; (4) the emergence of a cadre of highly trained and field-tested health workers thereby increasing Brazil’s domestic capacity in the area of trained personnel. There were other significant developments concerning Brazil’s domestic health system capacity that were linked to the development and implementation of the Expanded Program on Immunization in Brazil in the late 1970s. These different factors and developments are examined in the following sections.

Central Government as Steward and the Capacity for a Truly National Program

One of the primary weaknesses of Brazil’s National Polio Control Program (NPCP) in the early 1970s was its limited scope. Throughout its brief two-year lifespan the NPCP was never operational in more than 14 states. In addition to its limited scope, the NPCP was constrained by inadequate, and in some areas, nonexistent, programmatic guidelines, inconsistent technical cooperation from the Ministry of Health, and a general absence of leadership within the Ministry. All of these issues were related to the notion of stewardship and the fact that prior to the 1970s the Federal Government did not have a clear stewardship role in Brazil. This began to change in
the mid-1970s thanks in part to the military regimes centralization efforts and an atypical period of administrative stability within the Ministry of Health.

One of the key factors cited in chapter four as having obstructed capacity development initiatives at national and subnational levels, limited the possibilities for long-term planning, and constrained inter-institutional collaboration during the 1960s and early 1970s, concerned administrative instability within the Ministry of Health and health research and training institutions. During the first and second implementation episodes between April of 1961 and the end of 1973, there were 12 different Ministers of Health in Brazil. Instability within the Ministry of Health created instability within public health initiatives and lack of continuity in terms of resources and policy priorities. In addition to instability within the Ministry of Health, thanks to political persecution under the military regime, there was also significant instability within Brazilian research and training institutions such as the Oswaldo Cruz Institute, as discussed in chapters three and four. Instability made it difficult to establish long-term research programs, develop collaborative projects across institutions, or develop domestic capacity within the Ministry of Health or related public health institutions.

In contrast to the instability during the 1960s and first half of the 1970s, the period between 1974 and 1985 was a period of relative calm and continuity within the Ministry of Health and related institutions. Dr. Paulo de Almeida Machado was appointed Minister of Health on March 15, 1974, and stayed in his post for the full five-year term, leaving the Ministry on March 14, 1979. While his immediate successor was replaced by after only a few months, Dr. Waldyr Arcoverde was appointed Minister of Health in November of 1979 and similarly remained in his position for the full five-year term. Throughout Brazil’s public health history from 1950 to the present, Almeida Machado and Arcoverde are the only two Ministers of Health...
who have served for a full five-years. The fact that the two longest serving Ministers of Health served back-to-back, helps explain the continuity in domestic capacity development during this period as well as the more effective collaboration between actors within the Ministry and other institutions. The stability within the Ministry of Health was bolstered by efforts within the government to centralize authority within Federal Government institutions.

The early 1970s marked the beginning of a period of centralization under the Médici administration (1969-1974) that, when combined with the period of administrative stability within the Ministry of Health, had important consequences for immunization initiatives in Brazil. When the National Immunization Program (NIP) was launched in 1973 it created, for the first time in Brazil’s history, a national immunization schedule, which provided a series of much needed basic programmatic guidelines for immunization programs in states throughout the country. One of the primary objectives of the NIP was to centralize immunization programs and guidelines within the Ministry of Health and to integrate a series of more vertical disease-specific initiatives (including the National Polio Control Program) into one single immunization program. Along with the NIP, national immunization laws were enacted requiring full immunization of all children less than one year of age (DPT, smallpox, poliomyelitis, measles, and BCG - all diseases included within the EPI). Failure to comply resulted in forfeiture of family allowances for the children that were otherwise provided by the government. At the end of 1977, pursuant to the launch of the EPI, PAHO reported, “The demand for immunizations increased considerably as a result of this law.”

Along with establishing vaccination legislation related to the National Immunization Program, in the 1975 the Federal Government established Brazil’s first nationwide surveillance system. For the first time in Brazil’s history there were national reporting requirements,

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standardized data collection procedures and reporting mechanisms, and laws outlining plans for
the development of subnational surveillance systems, all of which were to be centrally
directed. The responsibility for developing Brazil’s national and subnational surveillance
capacity was delegated to Dr. João Baptista Risi Jr. and the Special Public Health Services
(SESP), a semi-autonomous agency under the Ministry of Health. Dr. Risi first designed a model
for a national polio surveillance system in Brazil while attending a CDC-PAHO collaborative
training program at CDC headquarters in Atlanta in 1971. Although his design had been ignored
when the NPCP was launched in 1971, at the SESP he had the opportunity to help develop a
strong and truly nationwide surveillance system during the second half of the 1970s.

The SESP was created by a joint-partnership between the United States and Brazil in
1942 after Brazil became the only country in Latin America to join the Allies during World War
II. It was initially staffed by U.S. physicians and technicians and focused on basic sanitation
and disease prevention (malaria in particular) near U.S. military bases as well as in rubber
tapping and mining areas which were deemed vital to Allied efforts during the war. When the
United States stopped funding the program and transferred full authority for its continuation over
to the Brazilian government in 1960 it became an autonomous department within the Ministry of
Health and called the SESP Foundation. Throughout the 1950s and 1960s, the SESP developed
into something of an elite division within the Ministry of Health where many of the country’s
leading health officials had worked at one point or another. For example, Marcolino Candau
served as director of the SESP prior to becoming General Director of the WHO in 1953. Other

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73 Hochman, "Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda,” 239.
74 McGuire, Wealth, Health, and Democracy in East Asia and Latin America, 164.
75 Hochman, "Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda.”
key figures in Brazilian public health campaigns such as Ciro de Quadros were similarly linked to one another through the SESP. The SESP helped to establish a strong domestic community of experts in Brazil who were linked to one another through their work on various initiatives as well as linked to other actors throughout the Americas through training and collaborative efforts with other international organizations.

James McGuire writes that by the end of the 1960s the SESP had become “one of the Brazilian Government’s ‘pockets of efficiency.’” McGuire explains that the SESP “won great respect from national and international technical personnel,” and developed a “reputation for honest, efficiency, and effectiveness in public health.” In 1974, a five-year agreement was signed between the SESP Foundation and the Ministry of Health, in collaboration with PAHO, whereby the SESP was placed in charge of “promoting and supervising epidemiologic surveillance and immunization programs carried out by state health departments” for the entire country. This project helped to increase subnational health system capacity throughout Brazil and also provided a new source of credible indicators that would be used to develop subsequent immunization initiatives. The surveillance efforts within the SESP involved active collaboration with PAHO throughout the second half of the 1970s and provided an example of external actor influence in domestic capacity development.

The centralized functions within the Ministry of Health related to immunization were further strengthened with the adoption of the EPI in Brazil in 1977. The EPI was a Federal Government health initiative that was administered by state-level health departments with guidelines and technical support provided by the National EPI Manager Dr. Fernando Gomes, and his staff within the Ministry of Health. Vaccines for the EPI in each state were distributed by

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77 Ibid.
the Drug Control Center (CEME) of the Ministry of Social Security and Welfare, through an agreement established by the Ministry of Health. This demonstrates that the Ministry of Health had the authority and capacity to coordinate actions with other Ministries as well as subnational actors, and the increased regulatory authority to oversee vaccine distribution for EPI programs in every state in the country. In contrast, during previous implementation episodes there was virtually no regulation of vaccines, no central distribution center, no coordination, and no guidelines provided by the Ministry of Health.

These changes in favor of greater authority and responsibility for immunization assumed by the Ministry of Health at the national level related to the development of Brazil’s national EPI, established a new precedent in Brazil and the foundation for the polio campaign in 1980. When Brazilian public health officials within the Ministry of Health first discussed mass campaigns in early January of 1980, they agreed that the campaigns would proceed under the supervision of Dr. Fernando Gomes, Brazil’s National EPI Program Manager. The EPI, combined with the changes within the Ministry of Health, had established a solid framework that could be used for the more accelerated polio campaigns. The integration of the mass campaigns with the broader EPI program established an important precedent for the subsequent regional polio eradication and accelerated EPI initiative. Polio campaigns were not viewed as vertical campaigns but rather one of a range of strategies used to increase vaccination coverage and mobilize communities to support vaccination, within the broader EPI.

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Subnational Implementation Capacity

Prior to the mid-1970s there was a considerable amount of subnational variation in Brazil in terms of health system capacity development and technical cooperation projects involving PAHO staff and resources. Most health system development initiatives and technical cooperation agreements were supervised by each of Brazil’s five different macroregions. In the mid-1970s the Ministry of Health assumed central responsibility for all PAHO/WHO collaborative efforts. This gave the Federal Government more authority over subnational capacity development and established the Ministry of Health the primary national coordinating body for external cooperation and assistance. PAHO reported that, “In keeping with this decision, the Ministry’s operational capacity was strengthened…and peripheral projects were consolidated into national projects with centralized leadership.”

As part of the 1976 shift, the Government developed a plan to begin addressing some of Brazil’s longstanding subnational variation in resources, institutional capacity, and population access to services. A program was developed to extend access to services in the Northeastern Region that would include nine states and part of the State of Minas Gerais with a total of $200 million in state financing allocated for the project. Similar to the rural health initiatives in Mexico, community participation played a central role in the strategies promoted in the Northeastern parts of Brazil. Community participation in health initiatives prior to the late 1960s and early 1970s was relatively uncommon and inconsistent in Brazil. The shift in the Northeast during the 1970s established an important precedent and platform for the polio immunization campaigns and the EPI.

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80 The five macro-regions included: Amazon or Northern, Central-Western, Northeastern, Southeastern, and Southern.
82 Ibid.
By using community health workers and volunteers, it was possible to expand access to basic services and preventive interventions with fewer resources and in the absence of stronger permanent infrastructure for health. This was one of the primary elements of the Cuban polio model and had been similarly important in Mexico during the 1960s and 1970s. Primary health care programs in several Northeastern states were developed with technical cooperation provided by PAHO and UNICEF.

The effects of community mobilization and alternative strategies to expand access to care were visible shortly after the launch of the EPI in Brazil. The largest coverage gains reported by Brazilian EPI staff at the end of the 1970s occurred in the poorest states; specifically those in the Northeastern part of the country where volunteers were being mobilized and community health workers were most active. The EPI Newsletter reported in December of 1979, “The data presented from 1978 and 1979 demonstrate the efforts made by the National Expanded Program on Immunization to increase coverage in Brazil, particularly in those regions which have had the lowest coverage in the recent past.” The availability of data at state and local levels was evidence of the capacity development work done during the second half of the 1970s. As part of the surveillance project developed under Risi’s leadership within the SESP in 1975, SESP staff collaborated with state and local actors so that, by the end of the 1970s, each state and municipality had developed its own surveillance system.

This newly available data made it possible to effectively adapt programs to meet the needs of local communities and to better suit local conditions. One of the key issues that had

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84 Kurt Weyland discusses the municipal-level adoption of a primary health care program in Brazil in Niterói near Rio de Janeiro and based on the Cuban “family doctor” program. The program in Brazil was the result of a direct exchange between Brazil and Cuban officials. After a dengue and meningitis outbreak in Niterói, local officials requested assistance from Cuban infectious disease experts. Cuban doctors worked with Brazilian officials in Brazil, which resulted in another exchange when Brazilian public health leaders in Niterói traveled to Cuba to speak with Cuban public health officials and observe the family doctor model. See Weyland, *Bounded Rationality and Policy Diffusion*, 224-25.

constrained the NPCP during the early 1970s was that it had not included surveillance or any sort of program evaluation and thus it was impossible to effectively adapt the program. When the EPI was launched at the end of the 1970s, evaluation was a priority and included within regional, national, and local EPI training workshops and program manuals. By the end of 1981, 129 Brazilian officials had participated in national EPI workshops and another 1,116 local EPI staff had been trained during local workshops conducted by “multipliers” - EPI staff trained in national or regional workshops. This meant that within the first year of the polio campaign’s launch, there were 1,255 national, state, and local EPI staff members who had been trained to conduct their own immunization program evaluations and who had access to the tools and support to adapt their local programs based on those results.

Domestic Communities of Experts and Transnational Support Networks

In addition to the myriad institutional capacity developments that helped make the polio campaign possible in 1980, a strong domestic community of experts with access to the policy process and strong ties to the regional community of experts established by the EPI also strengthened polio campaigns in Brazil. Chapter four provided Brazil’s National Polio Control Program as an example of a failure to learn, with the NPCP repeating the mistakes of previous programs and ignoring the evidence and advice generated by domestic experts. This failure to learn was explained by the antagonistic relationship between Brazil’s domestic experts and the military regime and the damage done by the regime to domestic research institutions in the second half of the 1960s and early 1970s. Changes in domestic conditions during the second half of the 1970s created new opportunities for domestic communities of experts.

Simon Schwartzman refers to the second half of the 1970s in Brazil as a period of “enlightened authoritarianism” whereby the military regime increasingly created space and provided resources for scientific research and related capacity development. As a result, Brazil’s existing communities of experts had new opportunities and support for research and training initiatives. An additional change during the second half of the 1970s was the distensão, or “decompression” within the Brazilian political system, which gradually opened the previously closed system and policy processes to new actors. As a result, Brazil’s domestic communities of experts gradually gained greater access to the policy process that created more conducive conditions for policy learning from both previous domestic examples and external models.

Explaining the factors influencing the development of the polio campaign in 1980, Dr. Risi wrote, “A new plan of action was approved for the period 1980-1984, a move that reestablishes the strategy of mass vaccination on the basis of field experience accumulated during the previous decade.” Another factor that influenced Dr. Risi and his colleagues was an article published by Dr. Sabin in 1979 that provided a more detailed outline of the strategy Dr. Sabin had been proposing for years. In the article Sabin stated that, “the most important factor impeding the elimination of paralytic poliomyelitis from economically underdeveloped countries is programme administration.”

Sabin cited work in Mexico done by Manuel Ramos Alvarez and the experience in Brazil in the early 1960s where mass campaigns to combat polio were adopted but then not maintained or scaled up to achieve effective and sustained control. Sabin went on to highlight the key

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87 Schwartzman, A Space for Science: The Development of the Scientific Community in Brazil 4-5.
89 "Poliomyelitis in Brazil," 172.
aspects of the Cuban campaign that he viewed as being responsible for its success (also discussed in depth in chapter three of this dissertation). According to Sabin:

The overall planning was centralized in the Ministry of Public Health while the organization responsible for the actual administration of the vaccine was decentralized in progressively smaller regional units, in which maximum use was made of unpaid non-professional personnel.91

The organization and structure of the Cuban campaign as outlined by Dr. Sabin was a combined centralized and decentralized system, however Sabin noted that the basic core elements of the program would have to be adapted to suit different domestic conditions. Sabin stated:

Except for the basic principle of centralized national planning and decentralized regional and local implementation, most of the organizational details, such as the location and staffing of the maximum possible number of vaccination centres within walking distance of the parents, the training and supervision of the large numbers of unpaid, unskilled volunteers, the nature of the information programme, etc. must necessarily be different, not only in different countries but also in different regions of the same country.92

Dr. Risi explained, “That paper turned out to be very important to me, for it increased my confidence in the strategic approach I had used in the early 1970s.”93 Dr. Sabin’s widely publicized work on polio eradication provided additional leverage to domestic actors in Brazil and helped generate support for the program. Brazil’s program, regardless of whether it was inspired by domestic precedent or external models, was what Dr. Sabin had been proposing to health leaders all over the world for nearly two decades.

In addition to have greater access to the policy process, Brazil’s domestic communities of experts and public health workers who’d been involved in previous smallpox and polio campaigns, were also active members of regional communities of experts and actor networks. Thanks to these overlapping actor networks and the strong regional community of experts established by the EPI, Brazil’s EPI and polio campaign leaders had easy access to innovations

91 Ibid., 152.
92 Ibid., 153.
being used in other Latin American countries, feedback and advice from other experts in the region, and regular opportunities to discuss the program in Brazil with other EPI managers, international experts, and PAHO staff.

Brazil’s EPI manager, Dr. Fernando Gomes, was one of the original Latin American experts recruited by Ciro de Quadros to help develop the EPI training modules prior to the formal launch of the EPI within PAHO in the late 1970s (discussed in chapter five). Similarly, Dr. Roberto Becker, one of the key actors involved in developing Brazil’s national polio strategy in January of 1980, was one of the Brazilian officials sent to the regional EPI training workshop in Lima, Peru in 1979. Brazil’s surveillance champion, João Baptista Risi was also connected to Ciro de Quadros dating back to their work together on Brazil’s smallpox eradication campaign in the late 1960s. Risi was also one of the original experts appointed to PAHO’s Technical Advisory Group (TAG) in 1985 pursuant to the launch of the regional eradication campaign. The overlapping actor networks linking Brazil’s domestic experts to other actors in the region, as well as the regional community established by the EPI, provided an essential source of support for Brazil’s polio campaign during a period of instability linked to Brazil’s political transition in the mid-1980s.

Explaining Continuity Against the Odds: Policy Survival in the late 1980s

In 1985 Brazil’s first civilian government since 1964 under José Sarney assumed power. With a new president came new cabinet members, among them Minister of Health Carlos Sant’anna who was appointed in March of 1985. Vocal and influential members of the sanitarista movement dominated the new health sector leadership. The sanitaristas were known as left-leaning health reformers who opposed the vertical programs of previous governments and were
powerful advocates in favor of the total reorientation of the Brazilian health system, specifically calling for decentralization and universalization of the system. Dr. Risi explained that the new leadership was “eager to discontinue the so-called vertical practices, including the mass vaccination campaigns” that had been favored by the military regime. Less than a week after the transition within the Ministry of Health Minister Sant’anna called a meeting to discuss the fate of these programs, with the polio campaign high on the agenda.

If Brazil’s own public health precedent was anything to go by, this transition within the Ministry of Health did not bode well for the polio campaigns. In 1964 a transition within the Ministry of Health and corresponding political transition had resulted in the total abandonment of mass polio immunization campaigns enacted by the previous government in 1961 and the disappearance of polio from the national public health agenda. Similarly, in 1974 a new Health Minister with a new mandate resulted in the abandonment of mass immunization campaigns and the premature termination of the National Polio Control Program in favor of routine immunization and the expansion (in theory) of more integrated services.

In 1985, a new Health Minister with a new mandate, now backed by an influential cadre of health reformers (the *sanitaristas*), was appointed, and set its sights on the polio campaigns. However, this time the polio program survived the transition and continued to be one of the most successful programs in Brazil during the next twenty years. The next sections examine the survival of this more targeted program in the new political context in Brazil, focusing on several interrelated factors that include: (1) the availability of credible indicators; (2) the influence of key policy entrepreneurs, transnational networks, and external actors; (3) a lack of viable policy alternatives and positive spillovers generated by the campaigns.

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94 Ibid., 175.
Credible Indicators

When polio campaigns were abandoned in Brazil in the 1960s and again in the early 1970s related to the National Polio Control Program (NPCP), public health officials both domestically and internationally cited the lack of credible indicators and surveillance data related to polio as a major constraint. In the early 1960s, polio was not even a notifiable disease in Brazil, and as a result there was very little consistent or credible data on the distribution or incidence of the disease. Public health officials could not rely on data to either demonstrate program impact or adjust programs to implement them more effectively. Additionally, based on the lack of data in the 1960s, it was difficult for public health officials planning subsequent campaigns, to assess the causes of failure of previous attempts. Without any consistent or reliable baseline data on immunization coverage from the immunization efforts in the early 1960s, public health officials couldn’t be sure whether or not the low levels of immunity found in communities were vaccinations campaigns had been conducted previously, were because programs had not been implemented effectively, or whether the vaccines that had been used were of low quality and thus not did not produce immunity even among vaccinated populations. In 1968 as part of the changes in disease surveillance taking place in Brazil linked to the smallpox eradication campaign, polio became a notifiable disease. This meant that for the first time in Brazil’s history polio was included in disease reporting systems throughout the entire country (to the extent that these systems complied with reporting guidelines). However, the surveillance system was still extremely weak and poorly coordinated at the national level in the late 1960s and early 1970s, and although the system had been effectively developed for smallpox surveillance, it had still not been similarly developed to report consistently where polio and other vaccine preventable diseases were concerned.

95 Brito Bastos et al., "Antipoliomyelitis Program in Brazil; a Serologic Study of Immunity Levels."
When the National Polio Control Program was launched at the end of 1971, in spite of the growing priority for surveillance in Brazil and internationally at the time, public health leadership within the Ministry of Health opted not to include polio surveillance as a core component of the NPCP from its inception. As a result, just as in the case of the previous polio campaigns, it was impossible to demonstrate that the program was having an impact and effectively reducing disease incidence. Additionally, the campaign could not be effectively adapted to better suit the needs of different states and localities, based on the limited amount of information on polio incidence available to program planners. This was exacerbated by the fact that the NPCP was only operational in 14 out of Brazil’s 27 states at the time, and the 14 adopting states were states with weak institutional capacity, limited resources for health, and even more limited resources for state and local-level disease surveillance activities. Dr. Risi cited a lack of credible indicators and reliable data as one of the key reasons why the NPCP was abandoned in 1974. One of Dr. Risi’s major efforts during the period from 1974-1979 when he was in charge of developing surveillance capacity in Brazil under the auspices of the SESP was to facilitate the development of state and local-level surveillance capacity, especially in the poorer states in the North and Northeastern regions of Brazil.

As discussed previously, the availability of credible indicators was a key factor in shaping the response of the federal government starting in 1980. Moreover, by 1985 when the leadership changed within the Ministry of Health, there could be no doubt that Brazil had taken surveillance quite seriously and invested in domestic surveillance capacity building. As a result, key actors like Dr. Risi who were fighting for the survival of the mass immunization campaigns had more than sufficient data to demonstrate the impact of the polio program to both domestic and international audiences. For example, during the 1983 international polio symposium
organized by PAHO, Dr. Risi was able to report that Brazil registered only 45 cases of polio in 1983.\textsuperscript{96} Opponents of the more targeted program could say what they liked about the program and its incompatibility with the broader and more comprehensive approach being championed within the Ministry of Health starting in the mid-1980s, but their objections couldn’t change the facts: the program was extremely effective and the dramatic results achieved initially had been improved upon and sustained since the program’s launch five years earlier.

Increasing Returns and Positive Feedback: Transnational Networks and the Power of Praise
Another group of factors that helps explain the survival of the Brazilian polio campaigns throughout the second half of the 1980s and early 1990s includes positive feedback and the influence of regional actor networks and norms. In January of 1980 when Brazilian authorities made the decision to adopt mass immunization campaigns to combat polio, they were deviating significantly from the dominant global health paradigm at that time. There was no external support for highly targeted mass campaigns, domestic actors within the \textit{sanitarista} movement had gained additional influence and legitimacy in the aftermath of the Alma-Ata Conference on primary health care held in 1978, and polio was by no means as serious as many of the other maladies affecting the Brazilian population. Brazilian authorities opted for a highly targeted campaign to combat polio in spite of these factors for a number of reasons discussed previously.

It is impossible to determine, after the fact, the impact the Brazilian experience might have had if it had been viewed as a failure. It would seem highly unlikely that the campaign would have mattered at all internationally other than to provide another strike against vertical programs and additional fuel to domestic reformers in their crusade for more horizontal

\textsuperscript{96} Risi Jr, "Poliomyelitis in Brazil," 174.
approaches. But the Brazilian program didn’t fail, on the contrary it was the most dramatic and successful demonstration of mass campaigns the world had ever witnessed at that point.

In March of 1983 the Brazilian program was one of the major topics of discussion at an International Symposium on Polio Control hosted by PAHO. The symposium brought together some 400 participants that included some of the best-respected and well-known infectious diseases specialists in the world. Participants came from over 50 countries representing a range of national government ministries, international organizations, and research institutions. Throughout the conference, Brazil’s highly successful example was widely acknowledged and praised by program participants and cited in a number of presentations. During the opening session representatives from the WHO’s Division of Communicable Diseases highlighted the “spectacular” results achieved in Brazil.97

The most effusive praise for the Brazilian model came from Dr. Albert Sabin who had had a change of heart upon witnessing Brazil’s first round of NIDs in 1980. Sabin stated, “I traveled widely in Brazil in 1980, 1981, and 1982, and marveled at the excellent nationwide organization and the immediate precipitous drop in the number of reported cases.”98 Sabin was so impressed by the Brazilian program after 1980, that when health authorities from other countries asked his advice before adopting their own immunization campaigns, he suggested they first travel to Brazil “to learn the details of the successful Brazilian organization.”99

In the midst of all of this praise and positive feedback, during his presentation Dr. Risi took the opportunity to alert conference-goers that the highly successful program’s future was uncertain in light of the impending political transition in Brazil. This provided an opportunity for

99 Ibid., S395.
Dr. Risi to use international acclaim and support from external actors, as a source of leverage back in Brazil. During the next 18 months the program received additional support thanks to the promotional efforts of key actors such as Ciro de Quadros.

When Ciro de Quadros was working to mobilize support for polio eradication among leaders within the global health community he consistently used the example of Brazil as evidence to support his argument. The successful Brazilian example was what ultimately convinced the once skeptical D.A. Henderson that the regional polio campaign was feasible. Henderson was a harsh and vocal critic of Brazil’s national smallpox eradication campaign in the late 1960s, citing Brazil’s surveillance failures and incompetent leadership. Henderson had first met Ciro de Quadros in Brazil while on a salvage mission to try to convince Brazilian authorities to follow WHO surveillance guidelines. Henderson’s own personal experience with the shortcoming of Brazil’s previous eradication campaigns made the dramatic turn-around starting in 1980 related to polio, all that much more convincing. Citing the Brazilian example that regional eradication was possible as the cause of his conversion, Henderson accepted Ciro de Quadros’ request and joined PAHO’s Technical Advisory Group as its chairman in 1985. Shortly thereafter, the primary architect of Brazil’s highly effective campaign, Dr. João Baptista Risi, joined Henderson on the TAG to help develop the regional plan of attack.

Similarly, in 1984 during his meeting with UNICEF Executive Director Jim Grant and Brazilian PAHO Director Carlyle Guerra de Macedo, Ciro de Quadros used the example of Brazil as proof that a more targeted initiative could be used to mobilize resources for immunization programs more broadly and quickly expand access to immunization services. Brazil’s example was so dramatic, especially given Brazil’s history of failure, it helped to convert a broad range of skeptics into believers, or at the very least to silence them.
Once the Brazilian program, enacted by the earlier group of pre-1985 health officials, had become the model endorsed first by the regional community and then by the international community, it became increasingly difficult for post-1985 health officials to abandon it. Paul Pierson explains this as “the costs of exit” associated with switching to some “previously plausible alternative.” Pierson is focused on domestic political arrangements and policy processes, however in the Brazilian case the costs of exit seem to have been increased predominantly by external actors with no direct influence on the domestic policy process. As discussed in chapter five, once the collective innovation decision to eradicate polio had been made by PAHO Members and regional EPI leaders, the “costs of exit” associated with going back on that decision would have been significant.

Timing and sequencing also appear to have been significant in this process. Brazil adopted NIDs and targeted polio before there was a clearly established regional or global norm in favor of either. As a result Brazil was ultimately praised not only for its accomplishments specific to reducing polio incidence but also for being an innovator in the first place. Positive feedback for the Brazilian polio program only continued to increase during the second half of the 1980s culminating in the WHO’s global polio eradication initiative launched in 1988 that similarly cited the Brazilian demonstration effect as proof of the possible.

Lack of Viable Alternatives and Positive Spillovers

In addition to being able to demonstrate impact, another factor that helps explain the continuity in policy in the second half of the 1980s was the lack of viable alternatives to existing strategies and programs. In spite of the improvements made during the 1970s and first half of the 1980s,

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Brazil’s health system in the mid-1980s was constrained by myriad inadequacies and weaknesses and on top of everything else was in the midst of a dramatic reorganization intended to decentralize the health system and increase the autonomy of subnational actors. However, Kurt Weyland writes that the sanitaristas had assumed that decentralization would automatically ameliorate long-standing issues in population access to and availability of health services and thus provided few specific proposals for how to extend even the most basic services to the poor. Although the health reformers had succeeding in pushing forward a range of significant formal institutional changes in the health sector, the functional effects of these changes would take years to develop.101 Ultimately, public health officials within the new administration could neither afford to abandon existing and highly successful polio programs nor afford the time and resources required to come up with better (and still feasible) alternatives of their own. The lack of feasible alternatives was conditioned in large part on existing institutional capacity in Brazil at that time.

The new civilian government in Brazil had inherited a health system from the military regime that was rife with inadequacies and inefficiencies. The health system was highly fragmented, focused on curative care, overly privatized, and concentrated in urban areas. Additionally, the public health sector was suffering from decades of neglect and underinvestment. From a high of 64% of all federal health spending in 1965, by the end of the 1970s the Ministry of Health received only 19% of all federal spending on health, with the remainder going to the contributory schemes of Brazil’s massive social security sector.102 By the mid-1980s tens-of-millions of Brazilians still lacked access to public basic health services. However, thanks to the EPI and polio campaigns, they did not lack access to immunization.

Throughout the 1980s Brazil dramatically increased immunization coverage for all EPI diseases. Additionally, Dr. Risi writes that NIDs became “operational vehicles” for other vaccines and interventions.\textsuperscript{103} For example, in 1984 Brazilian officials incorporated vitamin A supplements into NIDs thus expanding access to yet another basic yet often unavailable intervention. Several years later NID’s were used as a way to collect basic information on nutritional status among poor and rural communities that was then used to develop broader children’s health initiatives in target areas. Ultimately, NID’s not only eliminated polio, they helped provide a range of additional interventions and services that improved overall children’s health outcomes.

Ironically, it was mass campaigns and EPI in Brazil that effectively expanded access to immunization services to the entire population, and not the more comprehensive policy changes championed by reformers. Throughout the 1980s and 1990s (and still to this day) the National Immunization Program was one of Brazil’s most equitable health programs in terms of both access to services and outcomes. While Brazil still struggles with high levels of inequality in terms of access and outcomes in many other health areas, the immunization program has consistently been an outlier within the Brazilian health sector. Access to immunization in Brazil and immunization coverage levels, do not show significant subnational variations according to GDP, household incomes, or other socioeconomic indicators that have been cited to explain inequality related to other health programs and outcomes in Brazil.\textsuperscript{104}

Additionally, while community mobilization and organization was one of the key issues promoted by the reform movement, once again, it was the more targeted EPI/polio campaigns

\textsuperscript{103} Risi Jr, "Poliomyelitis in Brazil," 179.
that effectively mobilized Brazilian communities. In spite of the advocacy and lobbying work done by the health reformers in the mid-1980s to “democratize” public health in Brazil through the formation of Municipal Health Councils, by the end of the 1980s, only 118 Councils had been established throughout Brazil’s more than 4,000 municipalities. Community mobilization and organization concerning Municipal Health Councils was even weaker in rural areas, where as of 1989, only two such Councils had been established.105 In contrast, community mobilization was one of the significant legacies left by the polio campaigns in Brazil.

Starting in 1980 the mass mobilization of volunteers and community participation became an essential component of the national polio campaign strategy and was used consistently in campaigns throughout the entire country. The participation of Brazilian Rotarians is just one of many examples in this regard. In December of 1980, the year the polio campaigns were launched, there were over 38,000 Brazilian Rotarians who were members of 1,150 Rotary clubs in 23 Brazilian Rotary districts. Rotarians contributed tens-of-thousands of volunteers to the mass immunization campaigns during the first half of the 1980s. By 1988 the number of Rotary clubs in Brazil had increased significantly by more than 300 clubs, with 1,480 clubs located throughout the country. Brazilian Rotarians not only mobilized their local communities, they also mobilized resources. By the end of 1987 Brazilian Rotarians had raised over $1.3 million to support Rotary’s polio campaigns, with only six other countries in the entire world raising more to support Rotary’s PolioPlus campaign since its 1985 launch.106 Brazilian Rotarian mobilization is just one example of how polio campaigns helped to increase local community involvement in health initiatives.

106 The only countries to raise more money than Brazil were the United States, Japan, the UK, Germany, Australia, and Canada. The Rotarian (January 1988): 32
Brazil Case Study Conclusion

A convergence of factors in Brazil help explain the launch and development of Brazil’s highly visible and effective national immunization days in 1980. One of the most striking differences between the post-1980 campaign and previous implementation episodes concerns the scope of the post-1980 program covering the entire country. Previous programs in both the early 1960s and early 1970s were only ever operational in a limited number of states (1970s) or state capitals (1960s). In spite of intentions to gradually scale-up programs beyond initial pilot areas, a range of implementation constraints and shifting domestic health priorities derailed programs before they were effectively scaled up in both episodes. The post-1980 initiative was characterized by an immediate or “explosive” scale-up, whereby the program was launched throughout the entire country right away. While the majority of contemporary policy literature on program or policy scale-up suggests that incremental or more gradual scale-up processes are more likely to be sustainable, Simmons and Shiffman note that in certain circumstances policy windows that create opportunities for more dramatic change may provide considerable incentives for policymakers to pursue rapid or explosive scale-up processes.  

A convergence of factors helps explain the explosive scale-up of polio immunization campaigns in Brazil post-1980 that can be summarized as follows.

Overlapping political and economic crisis helped to create major legitimacy issues for the federal government that were made worse by a polio epidemic that took place in a wealthy state in the south where support for the federal government was already weak. This epidemic was one of several focusing events. The second major focusing event came when Albert Sabin arrived in Brazil to work with the Ministry of Health but instead ended up accusing federal authorities of

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“gross professional negligence,” calling for the Minister of Health to be fired, and nationally and internationally embarrassing Brazilian federal health authorities. Additionally, there were political tensions corresponding to the *abertura* where subnational political competition from opposition parties was increasing leading up to the reinstitution of direct gubernatorial elections in 1980 and the legalization of opposition political parties. Lastly, between 1974-1979 a key policy elite (João Baptista Risi Jr.) has been singly focused on building up Brazilian surveillance capacity so by 1979 there were credible indicators that could be used to demonstrate the magnitude of the polio problem and to measure the impact of the proposed interventions.

All of these things converged to create a policy window whereby there was an opportunity to dramatically change the way polio programs had been implemented in the 1960s and 1970s and rapidly scale the program up (this is referred to as “explosive scale-up”). A truly national program implemented in every state was politically advantageous for the federal government for several reasons. It showed no favoritism to some states or regions over others, it demonstrated the capacity of the national government to respond to a crisis, state health officials and governors had incentive to participate based on the fact that they would be running against legitimate opposition candidates for the first time since 1964 in the upcoming 1982 gubernatorial elections, and it preempted the possibility of Brazil becoming an international public health menace again as was the case with smallpox.

The 1980s witnessed the gradual and protracted transition to democracy in Brazil and with it a new Constitution drafted in 1988. During this time a major overhaul of the existing health system in Brazil was driven by the *sanitarista* movement whose members pressed for decentralizations and universalization of the health care system making health a right for all Brazilian citizens, placing greater priority on primary care and prevention, and emphasizing the
need for greater community participation in public health. Within the context of this dramatic transition in the health sector the more targeted polio campaign, a remnant of previous military dictatorships and reminiscent of previous military-style eradication campaigns, seemed like obvious candidate for abandonment. However, due to a combination of credible indicators to show that the program worked, a lack of viable alternatives proposed by health reforms, the work of key policy advocates both in Brazil and within international organizations, and the power of praise for Brazil as a leader in the regional and then global eradication campaigns, Brazil’s polio campaigns survived the transition.

Today, Brazil has one of the most comprehensive immunization schedules in the world. Immunization is provided freely to all citizens at over 35,000 public health clinics throughout Brazil. Immunization coverage throughout the past decade has averaged over 95% for most EPI diseases. Brazil has also effectively eliminated measles and controlled other common childhood killers. Brazilian immunization leaders continue to work with public health officials in other developing countries, promoting south-south cooperation in vaccine development and domestic capacity building. In spite of the continued struggles within Brazil’s broader health system related to expanding access to services, Brazil’s immunization program and its accomplishments stand out as an island of excellence within the health sector and as a concrete legacy of the Expanded Program on Immunization and polio eradication initiative in the Americas.
Mexican Case Study: Polio Eradication and the Diagonal Approach

Mexican public health officials launched mass immunization campaigns to combat polio in February of 1981 with the objective of scaling them up gradually to cover the entire population. By 1983 public health officials reported the lowest polio incidence in the country since polio first became a notifiable disease in Mexico in 1937. This marked an 85% reduction in polio incidence compared to annual rates between 1971-1980. Throughout the remainder of the 1980s polio immunization initiatives were effectively expanded and scaled up to cover the entire target population and Mexico successfully eliminated polio by 1990. Building on the experience and success of the polio campaigns, Mexican public health officials established Mexico’s Universal Immunization Program that brought childhood immunization coverage with all EPI antigens throughout the entire country up to an unparalleled 92% by 1993. According to Sepúlveda et al., the program also achieved “immunological equity,” decreasing health-related inequality even as income inequality increased. By the end of the 1990s Mexico had developed one of the most comprehensive immunization schedules in the world.

There were several significant factors that facilitated the rapid progress made in Mexican immunization programs during the 1980s that also influenced institutional legacies produced as a result. Most of these factors were linked to broader health sector reforms launched in Mexico in the late 1970s and early 1980s and can be summarized as follows:

First, health sector reforms prioritized increasing local-level implementation and adaptive capacity and the increased mobilization of local communities to participate in public health

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109 Ibid.
111 Former Mexican Secretary of Health Jesús Kumate (1988-1994) is credited with the concept of “immunological equity” by Jaime Sepúlveda.
initiatives. This was accompanied by a gradual decentralization within the health sector and expanded access to services based on a primary health care model.

Second, the reforms included a series of changes that expanded and further institutionalized the authority and responsibility of the Federal Secretariat of Health (SSA). One of the newly institutionalized responsibilities was for the Secretariat of Health to serve as the “intelligence center” for the entire health system, generating evidence, collecting data, and facilitating operational research to guide health policy making at national and subnational levels. This resulted in the establishment of new research institutions and new collaborative efforts between researchers and policy makers. An additional change was the increased coordinating capacity and “standard setting authority” of the Secretariat of Health over other agencies and actors involved in the health sector such as the Social Security Institute. This increased the Ministry’s capacity and authority to establish standards, programmatic and technical guidelines, and evaluation mechanisms across all public sector institutions operating as part of the broader health sector. All of these factors were related to stewardship and health system capacity.

In addition to the more gradual capacity developments and contextual changes, polio immunization initiatives as well as Mexico’s EPI were affected by two key focusing events that helped to accelerate progress and influence institutional legacies. In 1985 a severe earthquake struck Mexico City destroying large amounts of public health infrastructure, creating major resource shortages for public health initiatives, and temporarily suspending Mexico’s polio campaign. The crisis created a window of opportunity for Rotary International to step in to provide financial and organizational support to Mexican public health officials that helped to review the campaigns. A second critical juncture involving a severe measles epidemic in 1989 similarly served as a focusing event for the launch of Mexico’s Universal Immunization Program.
the following year. The critical juncture in the late 1980s helped influence the institutional legacies of the Mexican polio campaigns.

The following case study examines the way in which these different factors interacted with one another and influenced the development, implementation, and institutionalization of Mexican polio and EPI programs between 1980 and 1994. The Mexican case study advances three basic arguments. First, Mexico’s atypical political and administrative stability within the health sector dating back to the mid-1940s, as well as overlapping elite actor networks, facilitated gradual and incremental policy development and greater continuity in policies and priorities over extended periods of time. This helped to establish a series of centralized functions within the Secretariat of Health related to stewardship. Second, Mexico’s domestic public health precedent concerning the authority and responsibility of the Federal Government for providing basic public health services, and the authority of the Federal Government relative to subnational units, helped insure continuity in immunization programs and policies throughout periods of political transition. Third, Mexico’s preexisting capacity and concurrent changes in domestic conditions related to health sector reforms, were more noticeably influential in shaping immunization programs and institutional legacies throughout the 1980s and early 1990s, relative to the influence of specific EPI initiatives or the regional polio campaign.

Mexican Polio Campaigns in the Early 1980s

During the 1960s and 1970s Mexican public health officials succeeded in vaccinating a majority of the target population using a combination of routine immunizations and mass immunization campaigns. However, in the intervals between mass campaigns, routine immunization services weren’t strong enough to effectively cover the susceptible population. In spite of their superior
effectiveness relative to the exclusive use of routine services, mass campaigns were abandoned pursuant to the launch of a national immunization program at the end of 1973. Routine immunization services were limited in scope and dependent on the existence of permanent health facilities. A combination of unvaccinated children in rural and hard-to-reach areas, internal migration, and cohorts of children born between mass campaigns, resulted in increasing polio incidence once mass campaigns were folded into routine immunization services.

Dr. Jorge Fernández de Castro, Director of the Department of Epidemiology within the Mexican Secretariat of Health (1980-1984) and Mexico’s National EPI Manager in 1982, noted that while peak incidence in the 1970s was considerably lower than it had been in the 1960s as a result of previous vaccination efforts, during the period 1976-1980 polio continued to be a problem in Mexico. Fernández de Castro writes that in view of the limitations of routine services and existing immunization strategies, Mexican public health officials were convinced to re-adopt mass immunization campaigns in 1980 that were launched the following year.

The timing was inauspicious. Mexico was headed towards a severe economic recession by the end of the López Portillo administration (1976-1982). Incoming president Miguel de la Madrid (1982-1986) was forced to enact a series of austerity measures, suspending debt payments, devaluing the Mexican peso, and drastically reducing social program funding. Public health sector spending was reduced by 25.5% between 1982-1985. It was within the context of the worsening economic crisis that mass immunization campaigns against polio were re-launched in February of 1981. Due to “economic restrictions” only a single dose of the oral

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115 Ai Camp, Mexico: What Everyone Needs to Know, KL1753.
polio vaccine was administered during a five-day mass immunization campaign. Subsequent vaccinations were left to routine immunization services. The following year, two five-day mass campaigns were conducted in January and March of 1982 that effectively increased vaccination coverage, resulting in a dramatic drop in incidence.\textsuperscript{117}

In 1983, mass campaigns involved roughly 25,000 health workers, half of who were hired specifically for the campaign. An additional 15,000 volunteers also participated with the Mexican military providing support in “difficult areas.” All of the participants received a month of training prior to the campaign. Vaccinations were administered at roughly 7,000 health centers and established vaccination posts with additional vaccination provided by mobile brigades during the five-day campaigns.\textsuperscript{118} It is important to note that, in contrast to Brazil where campaigns relied primarily on volunteers and temporary vaccination posts, Mexico’s campaigns relied primarily on existing public health sector facilities, personnel, and resources.

**Second-Generation Health Reforms & Domestic Capacity Development**

In spite of the progress made during campaigns between 1981-1984, Mexican public health officials recognized that in the absence of more comprehensive strategies to effectively extend vaccination coverage, Mexico’s post-1980 effort ran the risk of replicating the shortcomings of previous implementation episodes. At the end of 1982, Mexican public health officials noted that only 83 (3.46\%) of Mexico’s total 2,398 municipalities reported cases of polio, compared to 325 (14\%) of municipalities in 1975.\textsuperscript{119} Reaching those remaining 83 municipalities on a consistent basis and sustaining immunization coverage throughout the rest of

\textsuperscript{117} Fernández de Castro, "Mass Vaccination against Poliomyelitis in Mexico," S398.
\textsuperscript{118} Ibid.
\textsuperscript{119} Ibid.
the country had to be achieved in order for Mexico to effectively eliminate polio. The following sections demonstrate how different aspects of Mexico’s “second-generation reforms” within the health sector made it possible to overcome the constraints that had limited progress during previous episodes discussed in chapters three and four.

**Health System Changes: Community Participation and Primary Care**

At the end of the 1970s Mexican government officials launched what Frenk et al. characterize as “second-generation reforms” within the Mexican health sector. The second-generation reforms prioritized increasing community participation in health initiatives and expanding basic access to health services to rural communities and the urban poor. Both of these aspects of the second-generation reforms facilitated the development and implementation of immunization initiatives throughout the 1980s. Specifically, the following sections demonstrate how these two factors helped facilitate stronger local-level implementation and adaptive capacity and strengthened the centralized functions and authority of the Federal Secretariat of Health (SSA).

As discussed in chapter four, in the early 1970s the Mexican government launched a number of initiatives intended to both increase and institutionalize community participation in public health. Community participation became an increasingly central element of the government’s overall strategy to expand access to health services in the late 1970s and early 1980s as Mexico’s economic crisis grew more severe. With increasingly limited resources and myriad budget cuts being made by the central government, public health officials and

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120 Frenk et al. locate the first generation of health sector reforms in 1943 with the establishment of the first in a series of new public health institutions, the Hospital Infantil, discussed in chapter three of this dissertation. Julio Frenk et al., "Evidence-Based Health Policy: Three Generations of Reform in Mexico," *The Lancet* 362, no. 9396 (2003): 1668.
121 Ibid.
policymakers turned to community participation as a way to expand access to health care in rural areas and under-served communities in a more cost-effective way.

Between March and December of 1977, the Secretariat of Health and other national institutions provided training for 2,300 health auxiliaries who were each nominated by 2,300 rural communities with populations of 500 people or more. In each of these 2,300 rural communities, local community members worked with trained auxiliary health personnel to construct 2,300 local health facilities by 1978. During the next two years, the Mexican Government built 2,100 additional new health clinics in rural areas. As part of this shift, in 1979 Mexican President José López Portillo launched IMSS-COPLAMAR a new program that sought to stimulate and formalize community participation in public health in a variety of ways. A basic element of the program was that local beneficiaries would contribute to the program through in-kind contributions of labor or resources, membership on local health committees, volunteering to help maintain local health clinics or participating in specific campaigns such as those for immunization. The head of each family served was asked to contribute ten days of service per year. Margaret Sherraden writes that COPLAMAR included different mechanisms (mostly councils and committees) to facilitate community participation in public health program planning and development at different levels.

Community participation continued to be a central aspect of the “second-generation reforms” within the Mexican health sector in the early 1980s. In 1984 Municipal Health Councils were established in an effort to expand community participation in health even further.

122 Cravioto Meneses, “Recent Progress in the Program for Extending Health Service Coverage to Rural Mexico,” 246.
123 Schneider, *Mexican Community and Health and the Politics of Health Reform* 33.
125 Ibid.
126 Ibid., 258.
Municipal authorities headed up the Council that also included village leaders, heads of local schools, representatives from local health services, clinic doctors, and representatives from local volunteer organizations. Sherraden explains that the objective of the Councils was not only to facilitate greater community participation but also to increase accountability and create vertical linkages between local and state actors and institutions.\textsuperscript{127}

According to Sherraden, COPLAMAR and affiliated programs were a cost-effective way to expand access to health services into rural areas by relying on different forms of community participation to cut total costs incurred by the federal government. Additionally, the increase in community participation facilitated and normalized local level adaptations of programs passed down by state and federal officials during the implementation phase. Municipal councils and local committees provided a forum for local actors where rules and policies were frequently reinterpreted and adapted to better suit the needs and resources of local communities. Sherraden notes that the increase in local level participation was beneficial to immunization programs.\textsuperscript{128}

Thanks to the foundations established by previous community participation initiatives, public health workers in Mexico were able to build on the preexisting community organizations and mobilization mechanisms to facilitate more effective immunization program adaptation and implementation at the local level. Staff worked with local community leaders and health committees to identify existing resources and provide training for community members so that they could help with local level immunization programs.\textsuperscript{129} Similarly, municipal health councils provided a clear point of entry into local communities for state and national staff promoting the EPI and polio campaign. They also provided a readymade leadership structure that could be used

\begin{footnotes}
\item[127] Ibid.
\item[128] Ibid., 261.
\end{footnotes}
to generate local-level support and buy-in from local leaders. An EPI staff member in Mexico reported, “There is already a community organization in place which is supporting these intensive campaigns. There are rural communities or municipalities with extremely small populations which have their own systems of work for national health campaigns.”

Stewardship Functions and Health Sector Reforms

In addition to increasing community participation in health and strengthening local-level adaptive and implementation capacity, the second-generation reforms also helped to strengthen the centralized functions and authority of the Federal Secretariat of Health. In 1981 the Mexican government launched the first-ever sector-wide commission to study and restructure the health system in Mexico with Dr. Guillermo Soberón as the head of the commission. With the presidential election of Miguel de la Madrid (1982-1988) Soberón was appointed Minister of Health in 1982. One of his early actions as Minister was to promote a Constitutional amendment establishing a right to health in Mexico for the entire population. Miguel González-Block explains that this change had the effect of “legitimizing the Ministry’s role as steward of the health sector.”

In February of 1984 the Mexican Congress passed the General Health Law that, according to Soberón et al. “interprets the Constitutional mandate in specific terms.” The specification of authority and responsibility of the new Constitutional mandate in Mexico stood in contrast to the poorly articulated roles and responsibilities of federal versus subnational health

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130 EPI staff member quoted in ibid., 39.
131 González-Block, "Leadership, Institution Building and Pay-Back of Health Systems Research in Mexico."
133 González-Block, "Leadership, Institution Building and Pay-Back of Health Systems Research in Mexico."
authorities within the new Brazilian Constitution passed in 1988. It also provided greater specifications and guidelines than had been available during previous implementation episodes in Mexico. According to Soberón et al. “The Law defines a series of basic health services for which the government assumes the responsibility of universal access.”

Finally, in August of 1984 the National Health Program was adopted which Soberón et al. defined as, “a policy instrument specifying the actions required to achieve the desired goal of a National Health System with universal coverage.” This series of changes provided the foundation required to effectively translate the formal institutions outlining the stewardship role of the Federal Government dating back to the Constitution of 1917 and previous Sanitary Codes, into functional policies.

The reforms in the late 1970s and early 1980s also increased the coordinating capacity and authority of the Secretariat of Health relative to other agencies involved in the Mexican health sector. Soberón et al. explain this as part of the “standard setting authority” of the SSA that facilitated the establishment of basic standards, guidelines, and regulations across all public organizations within the health sector. As part of this standardization, all public organizations were required to purchase their drugs (including vaccines) through a common procurement mechanism. The expanded and newly articulated authority and responsibility of the Federal Government and SSA was immediately evident in the early 1980s linked to the polio immunization initiatives.

As part of the new campaigns, a central coordinating committee was established within the Secretariat that was headed by Minister of Health Guillermo Soberón starting in 1982. The establishment of a centralized coordinating committee was inline with Soberón’s efforts to

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135 Ibid.
136 Ibid.
137 Ibid., 676.
strengthen the stewardship role played by the Secretariat starting in the early 1980s. The central committee included representatives from other health agencies with additional coordinating committees established at state and local levels. The coordinating committees included representative from local health councils and community organizations, strengthening local level involvement in planning and executing the campaigns. Like the Brazilian campaign discussed previously, the organizational structure of the Mexican campaign combining decentralized and centralized mechanisms, was a sort of hybrid and similar to the hybrid campaign structure developed by Cuban public health officials during the 1960s. This structure had also been part of the polio eradication program in Mexico in 1968-1969, however the coordinating capacity of the Secretariat and subnational capacity of state and local institutions was insufficient to support an effective hybrid system.

Operational Research and Credible Indicators: The Rise of the Young Turks

Additional aspects of the second-generation reforms in Mexico starting in the late 1970s included changes in public health leadership as well as increased emphasis on operational health research and the use of evidence and evaluation to inform policymaking. As part of the previously mentioned changes regarding the role of the SSA, Soberón et al. explained that the Secretariat would increasingly serve as the “intelligence center” for the entire health system. As the intelligence center, the SSA would be responsible for, “providing strategic planning to anticipate overall resource requirements, to develop norms and standards that will prevent quality differentials among states, and to promote and support research and development.”

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138 Frenk et al., "Evidence-Based Health Policy: Three Generations of Reform in Mexico," 1668.
This change was supported by a concurrent shift in public health leadership and strengthening of research institutions within the Mexican health sector. Frenk et al. explain that the shift within public health leadership meant that public health officials were increasingly appointed based on technical expertise rather than political affiliations.\textsuperscript{140} As explained in chapters three and four, Ministers of Health in Mexico during between 1943 and the end of the 1970s, frequently circulated between government agencies and research institutions, as well as between the health sector and elected offices. More than half of Mexico’s Health Ministers during this period also served as Governors representing the PRI and key states such as Mexico State.

This shift in leadership within Mexico wasn’t limited to the public health sector, but rather, the early 1980s in Mexico witnessed the emergence of the “tecnicos” throughout the Mexican government, most notably with the presidential election of Miguel de la Madrid in 1982.\textsuperscript{141} Within the health sector, the new technocrats and “scientist policymakers” emphasized large-scale surveys and evidence-based policy making.\textsuperscript{142} The rise of the “young Turks” and the shift in favor of more research driven policymaking were hallmarks of Dr. Guillermo Soberón’s tenure as Minister of Health (1982-1988).

Guillermo Soberón’s background and career trajectory help explain the changes he helped bring about at the SSA starting in the early 1980s. Soberón received his medical degree from UNAM in 1949 (overlapping with PAHO Director Héctor Acuña), at which point he was awarded a Kellogg Foundation fellowship to pursue a PhD in physical chemistry at the

\textsuperscript{140} Frenk et al., “Evidence-Based Health Policy: Three Generations of Reform in Mexico,” 1668.
\textsuperscript{141} Ai Camp, Mexico: What Everyone Needs to Know, KL1869. Miguel de la Madrid received a Master’s Degree in Public Administration from Harvard University in 1964-1965
\textsuperscript{142} Mark E. Williams, “Politics, Accidents, or Evidence? The Effects of Scientific Research on Health Care Policy in Mexico” (paper presented at the 24th International Congress of the Latin American Studies Association, 1995/09/28/30 1995).
University of Wisconsin. Upon completing his PhD in 1956 Soberón returned to Mexico and was appointed Chief of the Department of Biology at Mexico’s National Institute of Nutrition as well as Director of Research. The Institute was one of the original independent health research institutes established in Mexico starting in the 1940s along with the National Institute of Cardiology and Hospital Infantil (discussed in chapter three). In 1965 Soberón joined the faculty at UNAM as the Director of Biomedical Research (1965-1971). He went on to serve as Rector of UNAM from 1973-1981 where he oversaw the dramatic transformation of medical education at UNAM, developed a range of new research institutes and degree programs, and developed an extensive network of actors that included some of Mexico’s contemporary public health leaders. Miguel González-Block describes Soberón’s tenure as Rector of UNAM as “highly successful” and marked by “the growth of research institutions and public-private partnerships.”

Public health research and the integration of evidence and policymaking became increasingly important during the early 1980s linked to Mexico’s economic crisis. Soberón is quoted as stating, “In a crisis, the luxury we cannot afford is not to do research.” González-Block writes, “Research was trusted by Minister Soberón to provide the necessary evidence to consolidate sector-wide stewardship, secure universal access to health care and integrate program

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143 In 1957 Soberón founded the Department of Biochemistry at the Institute. Around this time Soberón became a founding member of the Mexican Society of Biochemistry and Immunology alongside key figures in the history of Mexican immunology including: Félix Córdoba; José Laguna; Sergio Estrada Parra; Carlos Biro, founder of the Mexican Immunology Club, head of the Department of Immunology at the National Institute of Cardiology, and key figure in the establishment of the Regional Immunology Research and Training Center in the mid-1960s; and Manuel Ramos-Alvarez, head of the Virology Laboratory at the Hospital Infantil in Mexico City and one of the pioneering figures in Mexican polio research who collaborated with Dr. Albert Sabin on some of the earliest live polio vaccines studies in Mexico in the late 1950s (this actor network is discussed in chapter four as the “Mexican Immunology Club”).

144 González-Block, "Leadership, Institution Building and Pay-Back of Health Systems Research in Mexico." Starting in 1972 Soberón also served as a member of PAHO’s Advisory Committee on Medical Research (ACMR) where he chaired several studies on the development of operational health research capacity and science policies in Latin America.

145 Author interview with Julio Frenk who quoted Guillermo Soberón, February 6, 2013.
management, all in a context of reduced health sector funding.”\textsuperscript{146} Public health sector funding dropped just over 25\% between 1982 and 1985.\textsuperscript{147} González-Block claims that the Center for Public Health Research (CPHR) created within the Secretariat of Health in 1984, was the “centerpiece” for the subsequent reform process.\textsuperscript{148} The central role played by the CPHR was thanks in part to its founding director.

While serving as Rector of UNAM in the 1970s, Soberón became acquainted with a young medical student by the name of Julio Frenk Mora. Upon finishing his medical degree at UNAM in 1979 Frenk left Mexico to attend the University of Michigan where he received a Master of Public Health (1981), a Master of Arts in Sociology (1982), and a joint Doctor of Philosophy in Medical Care Organization and Sociology (1983). At Michigan Frenk studied under Dr. Avedis Donabedian, one of the earliest and most influential champions of health systems research who played a pivotal role in shaping Frenk’s thinking and future work.\textsuperscript{149} In 1984 when Minister of Health Soberón launched the CPHR (which was based on Frenk’s proposal) he recruited and successfully repatriated his former student Julio Frenk to become the Center’s founding director, a position Frenk held from 1984 to 1987.\textsuperscript{150} The CPHR quickly became a key actor within major health reform initiatives underway in Mexico, including, but not limited to, developing new and cost-effective strategies for extending access to care to Mexico’s under-served populations.\textsuperscript{151}

Shortly following Frenk’s repatriation in 1983, one of Frenk’s friends and former medical school classmates at UNAM was also recruited to join the movement underway within the

\textsuperscript{146} González-Block, "Leadership, Institution Building and Pay-Back of Health Systems Research in Mexico."
\textsuperscript{147} Ibid.
\textsuperscript{148} Ibid.
\textsuperscript{149} Author interview with Dr. Julio Frenk, February 6, 2013.
\textsuperscript{150} González-Block, "Leadership, Institution Building and Pay-Back of Health Systems Research in Mexico."
\textsuperscript{151} Ibid.
Secretariat of Health. After finishing his medical degree at UNAM in 1978, Jaime Sepúlveda Amor traveled abroad to pursue postgraduate studies at Harvard University where he received a Masters in Public Health (1980), a Masters of Science in Tropical Medicine (1981), and a Doctorate in Population Science (1985). While at Harvard he continued to serve in various positions related to health research and epidemiology within official Mexican government health agencies and institutes. He returned to Mexico in 1985 and assumed the position of Director General of Epidemiology within the SSA, a position recently vacated by Mexico’s former EPI Director, Dr. Jorge Fernández de Castro. Sepúlveda explained that Minister of Health Soberón “was very open-minded and knowledgeable and he was brave enough to take a risk with the young Turks - Julio Frenk and myself.”

As part of the broader shift within the health sector towards evidence-based policymaking and the rise of the “scientist-policymaker,” the SSA began conducting national health surveys and placing data collection and utilization at the forefront of its national health policy agenda. Under Sepúlveda’s leadership, and in collaboration with the United States Centers for Disease Control (CDC), the SSA launched the most comprehensive epidemiological surveys ever conducted in Mexico. The 1985 surveys were a turning point in the development of Mexican polio campaigns. They revealed that in spite of comparatively strong immunization coverage levels at the national level, there were still significant disparities across states and localities.

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152 While Sepúlveda was at Harvard starting in 1980, polio expert and Nobel Prize winner Dr. Fredrick Robbins was the Dean of the School of Tropical Medicine. Jaime Sepúlveda’s brother, Bernardo Sepúlveda was a legal scholar and advisor to Miguel de la Madrid during his presidency during which point he also served as Mexico’s Ambassador to the United States (1982) and Secretary of Foreign Relations (1982-1988). Their father, Bernardo Sepúlveda Amor was a well-known Mexican physician. From Ai Camp, *Mexican Political Biographies, 1935-1993*, 668.

153 Sepúlveda held this position until 1991 when he became Vice-Minister of Health (1991-1994).

Additionally, official reports highlighted the fact that only 49% of Mexican infants were being fully immunized against polio through routine immunization services.\textsuperscript{155}

The subnational disparities in Mexico’s existing immunization practices were highlighted again in 1985 when Mexico conducted its first multi-disciplinary EPI program evaluation in collaboration with PAHO. Although the evaluation team reported significant progress, the limited scope of Mexico’s existing immunization strategies was noted as a major constraint preventing progress. These two concurrent national immunization evaluations generated a wealth of new information and evidence for Mexican public health officials and became the starting point for subsequent immunization initiatives launched in 1985 and 1986.

Earthquakes and Critical Junctures: A Window for Rotary International

As discussed previously, in mid-1985 when PAHO announced the launch of the regional campaign to eliminate polio by the year 1990, Mexico had already launched its own accelerated polio immunization campaigns. However, the campaigns had peaked at 80% immunization coverage in 1983. In addition to the launch of the regional campaign, which helped to reenergize the Mexican polio campaigns, another turning point in Mexican polio campaigns also came in 1985 with a convergence of events that created a window of opportunity for Rotary International to get involved. The following sections examine how overlapping actor networks linking Mexican health elites to international organizations including Rotary International and PAHO, facilitated effective coordination and collaboration on Mexican polio initiatives. The following section uses the personal and professional networks of Dr. Carlos Canseco, to trace the evolution

\textsuperscript{155} Assaad and Ljungars-Esteves, "World Overview of Poliomyelitis: Regional Patterns and Trends," S304.
of Rotary’s involvement in the polio campaign and the collaboration between Rotary International, PAHO, and the Mexican Government.

Like so many other key actors in Mexican public health history, Carlos Canseco received his medical degree from Mexico’s National Autonomous University (UNAM) which linked Canseco to key actor networks in Mexico that, along with professional networks established throughout the course of his career in Mexico, would later help to secure support for polio campaigns among Mexican political elites.\textsuperscript{156} In 1949 Canseco founded the Department of Allergology at the Medical School at the University of Nuevo León (Mexico’s first specialty department on allergology) where Canseco and his family had recently relocated. The following year Canseco joined the Rotary club of Monterrey where he would remain an active member and leader for the rest of his life. It was in Monterrey that Canseco got his first experience with mass immunization campaigns to combat polio and measles in 1972 while serving as the State Health Secretary for Nuevo León. As discussed in chapter four, Mexico launched mass immunization campaigns starting in February of 1972.

In 1982, Canseco served as Secretary of Health for Nuevo León for a second time at which point he began working with Dr. Jorge Fernández de Castro, Director of the Department of Epidemiology within the Mexican Secretariat of Health (1980-1984) and Mexico’s National EPI Manager in 1982. It was through Fernández de Castro that Canseco first met Dr. Albert Sabin, who was in Mexico in 1982 working with Fernández de Castro and several other Mexican

\textsuperscript{156} Canseco’s training at UNAM was in allergology. Upon completing his medical degree from UNAM in 1945 he received postdoctoral training at Northwestern University in Chicago and a specialization in clinical immunology at the University of Pittsburgh. In 1946 Canseco was a co-founder of the Mexican Society of Allergists alongside Dr. Mario Salazar Mallén, nicknamed the “Capo” of Mexican allergology by Argentine doctor and former student, Ernesto “Che” Guevara.
researchers on an aerosol vaccine to combat measles.\textsuperscript{157} Canseco recalled liking Dr. Sabin immediately and inviting him to come speak at the Rotary club of Monterrey where Canseco had been an active member since 1950. Sabin accepted marking the beginning of a long and productive friendship between the two men.\textsuperscript{158} Canseco, one of Mexico’s most prominent allergologist and advocates for pediatric health, was enthusiastic about the measles vaccine project and arranged to have health facilities in Monterrey made available to Sabin to support his work in addition to supporting field trials for the new vaccine. Shortly after resuming his position as State Health Secretary in 1982, Canseco reinstated mass campaign to combat polio and measles. Canseco explained that the campaigns in Nuevo León in 1982 were bolstered by the support and presence of Dr. Sabin.\textsuperscript{159} Canseco would call on his own experience as Health Secretary and his work with Dr. Sabin several years later when working to develop Rotary International’s polio campaign.

Another key network link for Canseco came that same year when, in 1982, PAHO Director Héctor Acuña (a fellow Mexican Rotarian, and also a close friend and colleague of Canseco’s) asked Canseco to lead a collaborative research project on chronic allergies at the Pan American Health Organization, the first study of its kind conducted in Latin America. While working with PAHO, Canseco lived part-time in Washington, DC, and befriended key actors within the Organization including Acuña’s successor Dr. Carlyle Guerra de Macedo (1983-1995) of Brazil. This established an important link between Rotary International and PAHO that facilitated collaboration between the two organizations in the Americas.

\textsuperscript{157} At the time, measles was a leading cause of infant mortality in Mexico and the proposed aerosol vaccine (like the oral polio vaccine) was viewed as a promising alternative to the more expensive injectable measles vaccine currently used in Mexico.
\textsuperscript{159} Ibid.
After completing his work for PAHO in 1983, Canseco assumed his new position as Rotary International President for 1984-1985. As Rotary president Canseco worked with other Rotary leadership to mobilize support for an international polio campaign within Rotary International. Through the campaign that came to be known as PolioPlus, Rotarians worldwide contributed over $240 million to global polio eradication efforts by 1988. However, beyond financial contributions, Canseco wanted Rotary International to contribute on a larger-scale. He wanted Rotary leadership to health coordinate local initiatives, collaborate with Ministries of Health, and work as a partner with international organizations such as PAHO and the WHO.

Canseco explained, “To prove that we could really help, we needed some examples.” The first example Canseco proposed was Paraguay, however, according to Canseco, Paraguay wasn’t enough. “They [the international community] were not convinced,” said Canseco. His solution was to scale things up dramatically, proposing Mexico as the next PolioPlus demonstration project. There were over 15 million children under the age of five that would need to be vaccinated in Mexico, fully 25 times the number of children that had been vaccinated during the national immunization days in Paraguay in September of 1985. Ultimately, Canseco went directly to Mexican President Miguel de la Madrid (1982-1988) and received the full backing of the Mexican government. The following sections examine the ways in which a convergence of factors in 1985 served as a critical junction for polio campaigns in Mexico.

While Mexico had already re-adopted mass immunization campaigns to combat polio and measles in 1981, the newly available credible indicators generated by the 1985 surveys and the EPI evaluation highlighted significant coverage gaps. When the regional proposal for polio

\[160\] Canseco is quoted in Neal, "Polio Conquered in the Western Hemisphere," 20.
\[161\] Canseco is quoted in ibid.
\[162\] As the State Health Secretary for Nuevo León, Canseco was a political appointee of President Miguel de la Madrid in 1982.
eradication was announced in May of 1985, Mexico, like Brazil, was cited as a priority country where greater progress was needed in order for regional eradication to be achieved. The regional campaign launch was a significant motivating factor for Mexican health officials. Once the campaign was proposed by PAHO and endorsed by Mexico, Health Minister Guillermo Soberón subsequently announced a plan for an accelerated polio immunization campaign in mid-1985 with the goal of eliminating polio in Mexico by the year 1990. Soberón assigned the bulk of the responsibility for the accelerated polio initiative to newly appointed Vice-Minister of Health Dr. Jesús Kumate who had also been recently appointed to PAHO’s Technical Advisory Group (TAG) alongside Dr. João Baptista Risi Jr. (Brazil) and former global smallpox eradication director, D.A. Henderson. Kumate’s position on the TAG helped generate additional priority for polio in Mexico and gave greater visibility to the Mexican program.

Planning for the launch of Mexico’s first national immunization days (NIDs) was derailed on the morning of September 19, 1985, when Mexico City was struck by the first of two devastating earthquakes. The first quake was the strongest Mexico had experienced in over a century as well as the longest, lasting for over two minutes. The second quake occurred on September 20, less than 36 hours later and exacerbated the demolition caused by the earlier quake the day before. Based on the distribution of public health resources in Mexico at the time of the earthquakes and high concentration of health facilities and health institutions in Mexico City, the health sector suffered extreme damages. The area most badly damaged during the quakes contained a concentration of major hospitals, including the National Medical Center of the Mexican Institute of Social Security (IMSS), which housed 25 buildings, one third of the IMSS’s hospital beds in the metropolitan area, and the largest medical library in the country.

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Since the majority of training and education for young medical students at the time took place within public hospitals, as a result of the earthquakes facilities used to provide training for over 6,000 students in the metropolitan areas were lost. Additional losses included research laboratories where facilities and equipment were destroyed which caused interruptions in research projects and dislocation of researchers.\textsuperscript{164} \textit{The Rotarian} reported that the earthquake, “temporarily forced national health authorities to shelve the immunization plan, while all available health resources were redirected to handle relief operations.”\textsuperscript{165}

Roderic Ai Camp describes the “inept” reaction of Mexico’s federal government to the devastation caused by the earthquakes in 1985 as having had long-term consequences for the legitimacy of the federal government and Mexico’s one-party political model.\textsuperscript{166} Additionally, the earthquakes combined with the austerity policies enacted in Mexico in the early 1980s in response to Mexico’s economic crisis, created new space for civil society organizations to emerge. In the aftermath of the earthquakes civil society groups and volunteers stepped in to help organize and assist relief efforts in a variety of ways. Among the organizations actively involved in the relief efforts was Rotary International. At the time of the earthquake there were over 11,000 Rotarians belonging to Mexico’s 450 Rotary clubs, with 72 clubs located in the Mexico City area alone.

Outgoing RI president Carlos Canseco was in Mexico City at the time of the earthquake when Rotary District Governor Jorge Sekiguchi contacted him to arrange an emergency meeting to mobilize Rotary’s subsequent relief efforts.\textsuperscript{167} Mexico City Rotarians provided thousands of meals to earthquake victims and set up 12 emergency centers using existing Rotary club

\textsuperscript{164} Ibid., 677.
\textsuperscript{165} McQuestion and Carlin, “Mexico’s Mission Against Polio,” \textit{The Rotarian} (June 1986): 38.
\textsuperscript{166} Ai Camp, \textit{Mexico: What Everyone Needs to Know}, KL1766.
\textsuperscript{167} \textit{The Rotarian} (February 1986): 42.
networks to collect, store, and distribute emergency supplies. Rotary leadership met with Mexican President Miguel de la Madrid and the First Lady to discuss Rotary’s efforts and future contributions. By September 27, 1985, a special program to raise relief aid for Mexico had been established through Rotary International and over the course of the next five months Rotary clubs from all over the world contributed more than $565,000 in assistance.  

A key actor within the Mexico City Rotary relief efforts was Rotarian and prominent Mexico City businessman Frank Devlyn. Devlyn was one of the first staff appointments made by Carlos Canseco when he assumed the RI presidency in 1984 and was placed in charge of all of Canseco’s outreach work in Mexico. Devlyn was also a member of Rotary District 417 along with District Governor Sekiguchi, and helped established the “Colorado Project” with Rotary clubs in the U.S. State of Colorado, to collect and distribute donations of medical supplies from U.S. hospitals to support relief efforts in Mexico. The project enlisted the help of PAHO and the support of the Mexican Government in October of 1985. Dr. Jesús Kumate quickly became a key ally within the Mexican Secretariat of Health and helped to secure duty-free entry of the donated medical supplies and the support of Mexican authorities.

The networks linking high-level Rotarians and Mexican government officials were critical in reigniting Mexico’s plans to accelerate polio immunization efforts after the earthquake. As discussed previously, Carlos Canseco proposed Mexico as a sort of PolioPlus demonstration project in mid-1985 to help illustrate Rotary’s potential contribution to larger-scale polio campaigns. Canseco’s proposal to use Mexico as a demonstration project to mobilize support for Rotary’s campaign was similar to Ciro de Quadros’ use of Brazil to generate support for polio eradication with PAHO and UNICEF. As a result, in early October 1985, within weeks

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168 The Rotarian (February 1986): 42.
of the earthquakes, Mexico received a PolioPlus grant of $1.25 million to help “revive immunization plans.” Shortly thereafter Vice-Minister of Health Jesús Kumate invited former PAHO Director and current PolioPlus Committee member, Dr. Héctor Acuña (a Mexican Rotarian and also longtime Mexican public health leader) to represent Rotary International at the SSA’s weekly planning meetings. Acuña had longstanding ties to the Secretariat and other political elites having served as Head of International Affairs within the SSA between 1971-1974 prior to becoming PAHO’s director in 1975. Dr. Méjico Angeles Suárez, national polio campaign director from the Dominican Republic and a member of Rotary’s PolioPlus Advisory Committee, was also invited to join the weekly meetings with Acuña.

Mexican Rotarians quickly mobilized to support the revived immunization campaign plans. Four prominent Rotarians formed a National PolioPlus committee to coordinate Rotary efforts for the entire country. The committee helped to prepare informational packets for every Rotary club president that contained information about the campaign, possible support activities that Rotary clubs could participate in and organize, basic information about the live polio vaccines and immunization strategies being used in the upcoming mass campaigns, and promotional materials for the campaign that would help clubs mobilize their members and local communities. The packet also included a simple reporting form that every Rotary club was meant to fill out and mail back to the National PolioPlus Committee detailing the group’s campaign-related activities at the end of each NID. Rotarians were also encouraged to contact

171 Note: Acuña and Méjico Angeles Suárez were connected to one another through Acuña’s previous work for PAHO as head of the Dominican Republic’s field office in the 1950s and early 1960s.
health authorities in their respective communities to see if there were other ways that Rotary clubs could be of assistance.\textsuperscript{173}

Héctor Acuña and fellow Rotarian Jorge Villanueva, the editor of Rotarismo en Mexico (Mexico’s Rotarian magazine), provided additional assistance to the campaign by mobilizing support for the campaigns among Rotary District Governors throughout Mexico. The two men sent letters to all of Mexico’s District Governors providing them with information about the upcoming campaigns. Frank Devlyn, top advisor to Carlos Canseco during his year as Rotary president and the owner of Mexico’s largest contact lens manufacturer, offered up his network of 96 retail stores throughout the area to serve as the central communications headquarters for the national polio campaign.\textsuperscript{174} Mexico’s private sector contributed in other ways as well. In his home state of Monterrey, Carlos Canseco mobilized members of the local business community to support immunization efforts. According to The Rotarian local businessmen contributed “an entire fleet of trucks” to distribute over 50,000 refrigeration boxes for Mexico’s cold chain to ensure the polio vaccines reached target populations intact.\textsuperscript{175}

The involvement and resource mobilization of Rotary International and the launch of PAHO’s regional campaign to eliminate polio by the year 1990 were both important factors in helping to explain the acceleration of polio campaigns in Mexico in the mid-1980s. However, the influence of external factors in the development, implementation, and institutionalization of Mexican polio and immunization campaigns, was conditional upon the convergence of domestic factors that changed the domestic context in Mexico. The following section examines how a second critical juncture at the end of the 1980s helped generate additional priority for

\textsuperscript{174} McQuestion and Carlin, “Mexico’s Mission Against Polio,” The Rotarian (June 1986): 39.
\textsuperscript{175} McQuestion and Carlin, “Mexico’s Mission Against Polio,” The Rotarian (June 1986): 39.
immunization that ultimately provided the foundation for Mexico’s Universal Immunization Program launched in 1990.

Mexican Institutional Legacies: The Diagonal Approach and the Quest for Immunological Equity

Just as the Mexico City earthquakes and a convergence of domestic and external factors served as a significant milestone in the domestic policy processes already underway related to polio campaigns in 1985, another critical juncture at the end of 1989 helped strengthen and institutionalize the gains made in immunization programs throughout the 1980s. At the end of 1989 a severe measles outbreak in Mexico revealed that in spite of improvements in Mexico’s immunization program during the 1980s and the virtual elimination of polio, there were still large pockets of unvaccinated children who remained vulnerable to vaccine preventable diseases such as measles. Although polio immunization coverage had increased dramatically linked to the accelerated polio campaigns starting in 1986, by the end of the 1980s public health officials had not yet achieved comparable coverage with other vaccines.

Beyond polio, EPI vaccines were primarily administered throughout the year within routine immunization services, with intensified mass campaigns conducted periodically. However, both EPI programs and mass campaigns focused on measles were largely limited to communities with more than 1,500 people. During the mid-1980s it was estimated that there
were over 187,000 small communities with fewer than 1,500 people throughout Mexico that accounted for 24 million (24%) of the total population of Mexico at the time.\textsuperscript{176}

In the aftermath of the measles outbreak in 1989, officials within the Secretariat of Health expressed their concerns that the existing surveillance format used in Mexico that was developed within PAHO as part of the EPI, wasn’t providing an accurate enough assessment of the real measles and EPI coverage situation in Mexico. In an effort to more accurately assess immunization coverage, in 1990 Jaime Sepúlveda and his colleagues at the SSA launched a more detailed and comprehensive national probabilistic survey that included a quarter of a million households. The survey indicated that only 42% of all Mexican children were being fully immunized according to the national Expanded Program on Immunization schedule.\textsuperscript{177}

The measles outbreak combined with the 1990 immunization coverage survey, converged with the World Summit for Children at the end of September of 1990. At the Summit, held at United Nations headquarters, Mexico’s president joined heads of state from 70 other countries declaring Mexico’s commitment to improving child survival through a series of concrete actions, one of which was expanding access to immunization. This convergence served as a critical juncture in Mexico inspiring the creation of the Universal Immunization Program in 1990. Its primary architect, Jaime Sepúlveda, explained that the measles outbreak exposed major inequities in the Mexican immunization program that had resulted in 70,000 cases of measles and 6,000 preventable infant and child deaths, primarily in rural communities and among already malnourished children.\textsuperscript{178} Based on this experience and newly available information about the magnitude of the existing coverage gaps, Sepúlveda and his colleagues adopted the concept of

\begin{footnotesize}
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\item Sepúlveda et al., "Improvement of Child Survival in Mexico: The Diagonal Approach," 2021.
\item Ibid.
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“immunological equity” as both the means and ends driving the development of the Universal Immunization Program in 1990.

The strategy behind the Universal Immunization Program was two pronged. The first step was to use surveillance data to identify pockets of low vaccination coverage where more targeted interventions were required. This meant going beyond either standard mass campaigns or routine immunization services to figure out ways to reach unvaccinated children. The second piece of the strategy was to collaborate with Mexico’s existing health research institutions to design more effective and targeted interventions to reach remaining vulnerable populations. Still to this day the Universal Immunization Program combines routine immunization services and more targeted efforts as two mutually reinforcing elements of the program.

Building on the success of the polio campaign and the lessons learned from the measles outbreak, a series of initiatives were developed to support Mexico’s Universal Immunization Program. On January 22, 1991, the National Vaccination Council (CONAVA) was established to harmonize vaccine and immunization programs across all of the different institutions within the Mexican health system. This is another example of the increased coordinating and “standard setting authority” of the Secretariat of Health discussed previously in this chapter. CONAVA was established by presidential decree and thus given the full backing of the national government. State Councils of Vaccination (COEVALs) were similarly established and chaired by the governors in each state who coordinated actions with state and federal health authorities. Increased national-subnational coordination was another focal area of the second-generation reforms launched during the early 1980s discussed previously.

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During this same timeframe PROVAC, a computerized system for maintaining individual vaccination records and basic public health information for children throughout the entire country was created within the Secretariat of Health that included vaccination records for roughly 12 million children.\textsuperscript{180} PROVAC was strengthened by a Presidential Decree in 1991 that required all public health institutions throughout Mexico to follow and ensure access to the same standard childhood immunization schedule.\textsuperscript{181} With the backing of the national government, the PROVAC system was rapidly implemented by all institutions within the Mexican health sector. Strong national leadership and oversight of subnational policy implementation facilitated the coordination and rapid implementation of the program nationwide.\textsuperscript{182} The PROVAC system was used to generate quarterly reports that made it possible for all public health institutions throughout the entire country to evaluate national, regional, state, and local progress as well as to identify problem areas where lower immunization coverage levels need to be addressed.\textsuperscript{183} This helped to facilitate increased subnational adaptation of basic programs according to the specific needs of local communities.

Based on the aforementioned developments within the health sector specifically related to immunization, Mexico’s immunization coverage spiked dramatically in the early 1990s. Within three years, national immunization coverage in Mexico exceeded 92% for all EPI vaccines up from an average coverage rate of 42% in 1990.\textsuperscript{184} By 1996 an evaluation of Mexico’s program conducted by PAHO reported that 97% of all children between 1-4 years of age had completed

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\item Sepúlveda et al., "Improvement of Child Survival in Mexico: The Diagonal Approach," 2021.
\item Ibid.
\item Former Mexican Secretary of Health Jesús Kumate (1988-1994) is credited with the concept of “immunological equity” and quoted in Sepúlveda et al., "Improvement of Child Survival in Mexico: The Diagonal Approach," 2021.
\end{enumerate}
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the basic childhood immunization schedule. Additionally, according to Sepúlveda et al., the program achieved its objective of “immunological equity,” ultimately decreasing health-related inequality even as income inequality increased.

The achievements made during the 1980s and early 1990s were sustained over time thanks in part to the traditional continuity in Mexico’s public health leadership. Dr. Jaime Sepúlveda who served as the Director General of Epidemiology (1985-1991) at the SSA was appointed Vice-Minister of Health in 1991 that provided another important source of support for immunization programs during Kumate’s tenure as Minister of Health (1988-1994). After serving as Vice-Minister of Health (1991-1994), Sepúlveda was elected Director-General of Mexico’s National Institute of Public Health in 1995. He was reelected to serve a second term as Director-General of the INSP in 2000. Later that year, newly elected President Vicente Fox (the first opposition candidate to win the Mexican presidency since the founding of the PRI) appointed Sepúlveda’s longtime friend, former medical school classmate, and colleague, Dr. Julio Frenk, to serve as Minister of Health.

Under Frenk’s leadership at the Secretariat of Mexico launched an ambitious series of health sector reforms intended to provide universal coverage to health in Mexico. Within the broader reforms developed in 2002 and 2003, Frenk and his team within the Secretariat established a safeguard for immunization services and other “non-personal” interventions. Based on evidence from Mexico’s own domestic experience as well as from other decentralizing experiences in countries like Colombia, funding for the health sector was divided into separate categories, distinguishing between “personal” as opposed to “community” health services. According to Knaul and Frenk, “This separation of funding is based on a public-goods theory

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186 Sepúlveda et al., "Improvement of Child Survival in Mexico: The Diagonal Approach."
and on lessons learned from previous reform experiences that have neglected community health services.”

Going back to the Mexican Constitution of 1917 and the Sanitary Code, these non-personal services such as preventive care and immunization, were deemed to be of national importance and therefore the responsibility of the national government to deliver and deliver to the entire population of Mexico as a right of all citizens. A central principle behind the reforms made launched by Frenk and his team was a direct institutional legacy of previous polio and national immunization campaigns: seemingly targeted programs could be designed to produce a broad range of positive consequences. This so-called “diagonal approach” was one of the most significant legacies from the campaign and is discussed in the following section.

**Positive Spillovers and the Diagonal Approach**

When Ciro de Quadros first proposed the idea of using polio eradication as a vehicle for the Expanded Program on Immunization in the Americas, he faced an extremely vocal range of opponents and critics within the global health community who opposed these supposedly “vertical” approaches, including the WHO’s Director General Halfdan Mahler. In Mahler’s opening address to the WHO’s General Assembly in April of 1983, Mahler claimed that the more targeted campaigns consisted of the “parachuting of foreign agents” into developing countries “to immunize them from above.” Mahler went on to malign the seemingly more targeted immunization campaigns being promoted by key actors such as Ciro de Quadros and UNICEF Executive Jim Grant. Mahler stated, “Initiatives such as these are red herrings…Without building up health infrastructures based on primary health care, valuable

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energy will only be wasted, and you will be deflected from your path.”\textsuperscript{188} Maggie Black writes that Mahler’s statement to the WHA was the “opening salvo” of a battle within the global health community over “vertical” versus more “horizontal” approaches to improving public health that would continue throughout the 1980s and beyond.\textsuperscript{189} However, Mexican public health officials such as Julio Frenk, Jesús Kumate, and Jaime Sepúlveda, viewed the debates themselves, rather than the approaches, as the true “red herrings.”

Twenty years after Mahler’s statement to the World Health Assembly, Mexico’s progress using vertical interventions to gradually expand access to more comprehensive child health care had effectively reduced mortality rates for children under the age of five from 64 to 23 per 1,000 children.\textsuperscript{190} Out of 60 countries originally included with the Millennium Development Goals focused on reducing child mortality by two-thirds between 1990 and 2015, Mexico was one of only seven countries on track to meet its target as of 2005.\textsuperscript{191} Mexican public health leaders ascribed the bulk of progress made to three primary interventions: the Universal Vaccination Program, the Clean Water Program, and National Health Weeks.\textsuperscript{192} Out of the three interventions credited with Mexico’s child mortality declines between 1980 and 2005, two were direct institutional legacies of the polio eradication campaign starting in the 1980s.

National Immunization Days to combat polio were scaled up to include vaccinations against measles and other vaccine preventable diseases and expanded into National Vaccination Weeks in 1988. National Vaccination Weeks provided the foundation for the launch of the Universal Vaccination Program in 1990. According to Sepúlveda, the experience gained from the

\textsuperscript{188} Halfdan Mahler’s speech to the World Health Assembly in 1983 is quoted in Nitsan Chorev, \textit{The World Health Organization between North and South} (Cornell University Press, 2012), 82.
\textsuperscript{191} Ibid.
\textsuperscript{192} Ibid., 2020.
NIDs and National Vaccination Weeks, provided the foundation for the launch of National Health Weeks in 1993 that included a basic package of public health services and interventions for children.\textsuperscript{193} Sepúlveda et al. defined the strategy developed in Mexico as a “diagonal approach,” or, “the proactive, supply driven provision of a set of highly cost-effective interventions on a large scale bridging health clinics and homes.”\textsuperscript{194} The authors continue, “This experience in incremental implementation of multiple public-health interventions could be thought of as the equivalent of a public health polypill.”\textsuperscript{195} The authors conclude by stating, “An artificial divide between the vertical approach, focusing on specific disease priorities, and the horizontal approach, aimed at strengthening the overall structure and functions of the health system, has been bridged in the public health experience in the country.”\textsuperscript{196}

Mexico Case Study Conclusion

In Mexico, in contrast to Brazil, there was no significant policy window or “critical juncture” specific to polio that produced a break from the past, but rather a more incremental process of change taking place in a variety of areas that all converged in the 1980s to support the polio immunization initiative. Although the earthquakes in 1985 and the measles epidemic in 1989 did help to accelerate immunization initiatives, they contributed to speeding processes that were already underway in Mexico with significant support from national leaders. Without such a dramatic window of opportunity as occurred in Brazil there is no reason to expect the same sort of “explosive” expansion process that took place in Brazil. Mexico’s more gradual and

\textsuperscript{193} Ibid., 2021.
\textsuperscript{194} Ibid., 2020.
\textsuperscript{195} Ibid., 2020-2021.
\textsuperscript{196} Ibid., 2024.
incremental program development post-1980 was consistent with previous program developments and initiatives launched during previous implementation episodes in the early 1960s and early 1970s. The key changes that were taking place in Mexico starting with the launch of the “second-generation reforms” within the health sector that help explain the more gradual implementation process included the following.

First, the second-generation reforms emphasized expanding access to health care through greater community involvement and mobilization and primary health care initiatives. These initiatives launched during the second half of the 1970s expanded the public health sector, increased the number of basic public health facilities, and established a foundation of community organizations (building on Mexico’s existing precedent of community involvement) that helped support immunization campaigns starting in the early 1980s. The focus on rural health care and increasing community participation helped increase local level implementation capacity by involving local leaders in the development and adaption of immunization campaigns.

Second, there was a major shift within the health policy leadership in favor of more applied public health research and integration of scientists into the policymaking arena. As a result, starting in the early 1980s scientists and public health officials circulated frequently and easily between newly established public health research institutions and government health policymaking positions. The leadership within the public health arena was increasingly based on a very well connected network of policy elites who had extensive networks in Mexico and within international organizations and research and training institutions in other countries. Additionally, Mexico’s key policy and scientific elites (in contrast to Brazil post-1980) starting in the 1980s were largely linked to a core group of similar issues including immunization, infectious diseases,
immunology, and health system evaluation – so there was a strong and powerful community of experts who were in agreement about basic issues and health priorities.

Third, the new técnicos within the health sector conducted a series of national epidemiological surveys that generated credible indicators revealing the weakness of the existing routine immunization services, which gave them leverage for mobilizing a more comprehensive policy response based on the shift within the Secretariat of Health favoring the greater integration of evidence into health policymaking. The strong institutional support for operational research and evaluation within the SSA under Minister Soberón starting in 1982 established a precedent that subsequent Health Ministers built on. Since 1982, every Minister of Health in Mexico has had a strong social science and research background and continued to prioritize health research and evidence-based policymaking.¹⁹⁷

Fourth, Mexico had the domestic precedent of having launched mass campaigns successfully throughout the country during previous implementation episodes and achieving comparatively high coverage levels. When combined with the improved data generated by the new cadre of técnicos, Mexico’s own experience could be drawn upon (and adapted) to expand coverage thereby having the added appeal of a domestically generated and homegrown Mexican solution to existing health problems. Additionally, the integration of research and policymaking in the 1980s helped make policy implementation more effective. Researchers and public health officials collaborated on different research initiatives with the early integration of researchers helping to develop “diverse platforms and tools” that could be used by public health officials. The integration of research made it possible to evaluate and adapt programs as needed to better suit local conditions and meet the needs of local communities.¹⁹⁸

¹⁹⁷ Author interview with Julio Frenk, February 6, 2013.
¹⁹⁸ González-Block, "Leadership, Institution Building and Pay-Back of Health Systems Research in Mexico."
The foundations provided by National Immunization Days to combat polio in the mid-1980s in combination with the previously mentioned changes in domestic conditions, produced concrete institutional legacies that directly affected health outcomes. NIDs were used by health officials to rapidly scale-up polio campaigns to include other childhood vaccines transforming NIDs into national immunization weeks in 1988, and the launch of national health weeks in 1993-1994 that added non-vaccine interventions for children under the age of five throughout the entire country. Additionally, between 1997 and 2004 Mexico’s immunization schedule nearly doubled and as a result, Mexico now has one the most comprehensive immunization schedules in the world.199

Cross-National Comparisons and Conclusions
Throughout the implementation episodes during the early 1960s and 1970s Mexico and Brazil varied significantly on a number of key factors that directly affected domestic policy implementation in both countries. Brazil’s Federal Government had weak administrative capacity and limited authority relative to subnational units and longstanding Brazilian public health precedent did not include an active or proactive stewardship role for the state to intervene on matters of public health. In contrast, Mexico’s public health precedent included strong administrative capacity and authority within the central government and limited autonomy of subnational units, as well as a series of sanitary codes and legal provisions requiring subnational

units to cooperate with the Federal Government. Mexico’s Federal Government and federal health institutions were established early on as stewards of the population’s health.

The authority and capacity of the Brazilian Ministry of Health was extremely limited prior to the end of the second implementation episode in 1974 at which point a series of institutional developments took place that increased the authority of the Ministry of Health and centralized a number of previously decentralized programs under its auspices. The changes within the Ministry of Health were facilitated in part by a period of rare administrative stability in Brazil whereby two Ministers of Health each served out their full five-year term and did so back-to-back creating a period of eight years with minimal leadership turnover within the Ministry. Brazil’s domestic administrative stability, program continuity, and expanded authority within the Ministry of Health during the period from 1974-1985, more closely resembled the situation in Mexico than at any other point in time covered in this dissertation.

As a result of this period of atypical continuity and stability within the Ministry of Health, by 1980 there was sufficient institutional capacity required to develop a new policy strategy in Brazil to more effective combat polio. The convergence of polio epidemics and overlapping political and economic crisis in Brazil at the end of 1979 provided a window of opportunity to implement the new strategy. Implementation was facilitated by Brazil’s Expanded Program on Immunization adopted in 1977, which provided the foundation for the polio campaign.

Many of the changes in Brazil concerning administrative capacity and authority within Ministry of Health, were already key aspects of Mexico’s public health precedent dating back to the first implementation episode in the late 1950s. The second-generation reforms in Mexico starting in the late 1970s and early 1980s, more clearly articulated the authority and scope of
work of the Secretariat of Health, however the basic structures remained firmly in place. Starting in 1980, Mexico didn’t diverge significantly from the basic strategy used to combat polio during previous implementation episodes. Unlike Brazil there was no exogenous shock to the system or crisis that created either an opportunity or the need to totally reorient their previous approach. As discussed in chapters three and four, the basic approach (national immunization campaigns directed by federal officials with federal resources coordinated with subnational actors who assisted with program implementation) used in Mexico during the 1960s and 1970s worked, it just didn’t work well enough and needed to be fully scaled-up to cover previously unreached populations and to be institutionalized to insure the program was sustainable.

The survival of the post-1980 program in Brazil was threatened during the political transition and health system reorganization in Brazil in the second half of the 1980s. This was exacerbated by a return to Brazil’s typically high levels of administrative instability within the Ministry of Health. Between 1985 and 1995 Brazil had ten different Ministers of Health. The administrative instability and reorientation of the health sector within Brazil during this period made institutional legacies produced by the Brazilian campaign less immediately visible than those produced by the Mexican campaign. While Mexican public health officials were able to quickly build on the success of the polio initiatives to launch more comprehensive immunization services, Brazilian public health officials were focused on simply ensuring their programs survival.

Additionally, the more targeted approach linked to the national immunization days wasn’t compatible with the broader reorientation within the Brazilian health system during the late 1980s, which further limited the immediate spillovers from the campaign. In contrast, the targeted strategy in Mexico was highly compatible with broader health reforms underway in
Mexico and compatible with health reforms enacted by each government that assumed power during the decades after the campaign’s initial launch. Whereas Brazil’s health reformers were focused on universal access and comprehensive approaches, Mexico’s public health leadership included the original architects of the “diagonal approach” that championed using these more targeted interventions to gradually expand access.
CHAPTER 7
CONCLUSION: LEARNING FROM LATIN AMERICA

Case Study Comparisons and Conclusions

The Cuban Polio Model Revisited

Cuba became the first country in the Americas and the second country in the world to effectively eliminate polio in 1963, just a year after introducing national immunization days to combat polio in 1962. Over the course of the next thirty years every country in Latin America adopted and implemented some version of the basic Cuban model, and in 1994 the Americas became the first region in the world to completely eliminate polio. The core elements of Cuba’s highly effective polio model developed in the early 1960s and discussed in chapter three included: (1) adaptive capacity of the health system; (2) effective combination of centralized oversight and decentralized implementation; (3) centrally coordinated intersectoral collaboration; (4) community mobilization and participation; (5) public information and education; (6) surveillance capacity and utilization of data and operational research to guide development; (7) coverage and scope of the program covering the entire population.

An essential lesson from the Cuban campaigns concerns the institutional legacies it left. The Cuban polio campaigns demonstrated the potential for disease-specific programs to generate much broader positive spillover effects. This is one of the most interesting legacies of the Cuban experience, and one that is largely untouched in the literature. Contemporary accounts of Cuba’s health system (at least those that view it favorably) go down the list of Cuba’s myriad and impressive accomplishments and the underlying values and principles that have made them possible, but devote very little attention to the policies that have translated principles into outcomes.
A closer examination of Cuba’s post-1959 public health history reveals a series of highly effective and highly targeted disease or issue-specific programs that were prioritized by health authorities. Childhood immunizations for example, were an area where Cuban public health officials could make an enormous impact with minimal resources and without waiting for broader health system development efforts to come to fruition. Targeted programs were pursued as a supplement rather than a substitute to more comprehensive initiatives. When Cuba launched its polio campaigns in 1962, it would have been impossible to focus on strengthening the existing national immunization program since there was no program at the time to strengthen. Polio could be eliminated in spite of this institutional deficiency, and in the process health authorities could increase public support for immunization, collect population health data, and engage multiple ministries and mass organizations in a common goal. What Cuba illustrated was that dichotomies between targeted disease-specific programs and broader health system development were inaccurate, unnecessary, and counterproductive.

Ultimately, the same basic core elements of the Cuban model that were responsible for the model’s effectiveness, when applied in other Latin American countries, resulted in effective policy implementation and the elimination of polio throughout the region of the Americas. They also helped produce positive institutional legacies in other countries as well. The following summaries of the three different implementation episodes in Brazil and Mexico between the late 1950s and early 1990s, demonstrate that while the two countries developed effective models at different times, ultimately similar strategies were used to eliminate polio in Brazil and Mexico by the end of the 1980s. The relative success of the strategies used in Brazil and Mexico were influenced by significant cross-national variations in domestic conditions throughout the course of the three different implementation episodes.
In general, there are several factors that remained relatively consistent in Mexico throughout the period of time covered in this dissertation that directly influenced polio immunization initiatives. The history of polio initiatives in Mexico between 1955 and 1995 is characterized by relatively consistent priority for polio and other vaccine preventable diseases, with episodes of concrete program adaptations during the 1960s, 1970s, and 1980s. Polio, as a communicable disease, remained a federal government responsibility throughout the different implementation episodes in Mexico. In contrast to other Latin American countries, Mexico’s political and administrative stability between 1955 and 1995 was remarkable. No other country in Latin America enjoyed similar domestic conditions. Even within Mexico, the administrative stability and continuity within the Secretariat of Health was (and continues to be) exceptional relative to other government institutions.\footnote{Author interview with Dr. Julio Frenk, February 6, 2013.} Administrative and political stability facilitated more gradual and incremental policy development and institutional capacity building initiatives. It also facilitated greater continuity in policies and priorities over extended periods of time.

The basic policy model in Mexico didn’t change dramatically between 1955 and 1995 (and even 2005) in terms of its core elements. The core elements are similar to the core elements of the Cuban model in many ways. The core elements included: (1) strong Federal Government authority and responsibility for the control and prevention of diseases nationwide and for the health of the entire population; (2) capacity and authority of the Secretariat of Health relative to subnational units and other public agencies and actors involved in the health sector; (3) coordination with subnational actors to support health initiatives; (4) inclusion of surveillance,
data collection, research, and evaluation in the policy process; (5) proactive, preventive, and interventionist approach to public health; (6) mobilization of local communities and popular participation; (7) inter-institutional collaboration. All of these core elements in the Mexican policy model can be accounted for in terms of our key independent variables--Mexico’s domestic public health precedent, administrative capacity, health system organization, domestic communities of actors and experts, and geoepidemiological factors related to proximity to the United States that facilitated increased access to information and consistent priority for polio.

All of these basic elements were present in the 1950s and remained central to Mexico’s approach to polio and vaccine preventable diseases up through the 1990s and beyond. During the first implementation episode in the late 1950s and early 1960s, these core elements gave Mexico a strong advantage relative to other Latin American countries during the same period. The Secretariat of Health and Welfare (SSA) had representatives in every state that facilitated coordination and execution of national initiatives, had strong ties to domestic research institutions where laboratory work related to polio was carried out, had the authority to intervene in states and pass public health legislation, and was Constitutionally ordained as the “supreme authority” on matters of hygiene and public health nationwide. In addition to the authority of the SSA, Mexico also had strong research and laboratory capacity relative to most Latin American countries, and more specifically research institutions and laboratories that were under the SSA’s authority or linked to it somehow. This provided the foundation for collaborative research initiatives between researchers and public health officials as seen in the polio vaccine studies conducted in chapter two, facilitated the early integration of research into immunization programs, and increased Mexico’s domestic adaptive capacity. The links between research and

2 Bustamante, "Public Health and Medical Care."
policymaking were facilitated by Mexico’s domestic communities of experts and high level of elite circulation within Mexican government and research institutions.

During the late 1960s and early 1970s, Mexican public health officials had more than sufficient evidence indicating that polio immunization initiatives during the previous decade had been effective in terms of increasing immunization coverage in urban areas and dramatically reducing disease incidence, but not effective enough when it came to reaching rural populations. Based on existing evidence and evaluations of the experience in Cuba involving the use of mobile vaccination teams, Mexican public health officials adapted the existing immunization program in an effort to extend coverage to smaller communities. This wasn’t a break from the past, but rather an adaptation of an ongoing program. The same core elements of the model continued to serve as the foundation for subsequent adaptations in the early 1970s as well. The primary concern within Mexican immunization programs discussed in chapter four wasn’t with the core aspects of the basic policy model, but rather how to more effectively operationalize the core aspects of it. In the absence of stronger institutional capacity and more clearly defined centralized functions within the Secretariat of Health, and stronger subnational implementation capacity, a significant gap persisted between the formal policy model and its functional operationalization. For example, citizens had formal rights to a range of basic social services provided by the state, however their functional rights remained limited by institutional deficiencies such as inadequate health infrastructure in rural areas throughout the 1970s. Additionally, Mexico’s Sanitary Code was explicit that states were obligated to assist federal authorities in executing public health initiatives with their very sovereignty at stake given the powers of intervention the Code gave to the Federal Government if states did not comply. However, throughout the 1960s and 1970s, inadequate subnational implementation capacity
meant that many states were unable to effectively fulfill their obligations. The primary focus of
the “second-generation” health sector reforms launched in the late 1970s and early 1980s
discussed in chapter six was bridging this gap and translating the core elements of the
overarching strategy into more effective policies and implementation structures.

A Constitutional amendment in 1982 established the right to health for all Mexican
citizens and provided the legislative foundation for consolidating the responsibility and authority
of the Federal Government. The General Health Law passed in 1984 provided the basis of action
for the Secretariat of Health and explicated a series of specific activities that were required to
effectively expand access to health care and ensure that the newly established right to health was
both formal and functional. Rural health care programs established in the late 1970s and early
1980s both increased and institutionalized community participation in public health initiatives,
which provided a foundation for community mobilization during the polio eradication campaign
throughout the 1980s and early 1990s. The establishment of public health research institutions
such as the Center for Public Health Research in 1984 and greater priority for operational
research and evidence-based policymaking increased the operational capacity of the Secretariat
of Health and facilitated the development of stronger adaptive capacity within the health sector.
A series of subnational health system capacity development initiatives intended to facilitate the
gradual decentralization of the health sector provided new mechanisms for coordinated action
between state and national authorities.

The effects of these changes were immediately visible in Mexican polio immunization
initiatives starting in the mid-1980s discussed in chapter six. The Secretariat of Health provided
clear and consistent operational and programmatic guidelines, provided resources and technical
cooperation to subnational actors, and worked with subnational actors to adapt programs to better
suit the needs of local conditions and communities. The increased coordinating capacity of the Secretariat of Health relative to other health agencies facilitated the standardization of immunization schedules, procedures, policies, and vaccine purchases. Newly established research institutions and initiatives provided the most comprehensive epidemiological data in Mexico’s history concerning immunization coverage gaps and operational research provided the basis for action to address them. Polio campaigns starting in 1985-1986 were designed using the new data and integrated new strategies to target existing gaps. Within seven years of the program’s launch immunization coverage for all EPI diseases including, but not limited to, polio, was over 90% with minimal subnational variation in coverage levels.

The core elements of the Mexican policy model that were visible in the first implementation episode in the late 1950s and early 1960s, and that was similar to the Cuban model, remained consistent up through the 1990s and influenced the institutional legacies produced by the campaigns. The performance of the Mexican immunization program in the early 1990s and its success in achieving “immunological equity” supports the argument in made in chapters three and four that the problem wasn’t with the basic policy model, but in its operationalization. Mexican immunization programs to this day retain the core elements of the original model, which has provided continuity in programming and outcomes throughout political transitions and overarching health reforms that have effects other public health initiatives but left the immunization program intact.

Based on the core element of the Mexican policy model outlining the supreme authority of the Federal Government on matters of general public health, in 2003 Mexico’s Minister of Health, Dr. Julio Frenk, crafted a legislative mechanism to secure Mexican immunization programs that established a separate source of funding within the Federal budget to fund “non-
personal” services such as immunization. In spite of other health reforms and shifting priorities and funding in Mexico, ensuring universal access to immunization has remained the sole responsibility of the Federal Government. Today, Mexico has one of the world’s most comprehensive immunization programs and higher immunization coverage on average than the United States and many other advanced industrialized nations.

Brazil Within-Case Comparison: 1960s, 1970s, and 1980s

In contrast to the more gradual and incremental evolution of polio immunization initiatives in Mexico, the history of polio initiatives in Brazil lends itself to a more “punctuated equilibrium” explanation characterized by periods of relative stasis and critical junctures where polio reemerged and then disappeared on the national policy agenda during the 1960s and first half of the 1970s. During two episodes in the early 1960s and early 1970s, polio appeared on the Federal Government’s agenda at which point a national polio initiative was launched. However, during both episodes polio campaigns were national in name only. Due to Brazil’s longstanding federalist traditions and the high levels of subnational autonomy, each state had the authority to decide whether or not to adopt the federal initiative or not. State and local actors in those states that did participate in federal programs during both periods, were largely responsible for providing the resources to execute the campaigns with only minimal technical cooperation and material assistance provided by the Ministry of Health. Gilberto Hochman describes an almost
identical pattern in his work on the “priority and invisibility” of smallpox on the Brazilian public health agenda during this same time period.³

There was relatively insignificant within-case variation between the first and second implementation episodes in Brazil during the early 1960s and early 1970s. Between 1956 when the Salk vaccine was first introduced in Brazil and 1974, polio immunization initiatives launched by both democratic and authoritarian governments shared a series of common features. The features included: (1) exclusion of surveillance, reporting, and evaluation; (2) fluctuating authority and responsibility for health programs between national and subnational actors; (3) weak authority and capacity of the Ministry of Health; (4) curative focus and reactive policy interventions; (5) lack of coordination between national and subnational actors; (6) optional program adoption and limited scope of programs in terms of both participating states and population coverage. During these two episodes there were no national immunization schedules, no standard programmatic guidelines or surveillance requirements, and no national oversight or regulation of campaigns or vaccines used in campaigns. None of the basic elements of the Brazilian approach between the end of the 1950s and end of the 1970s was conducive to effective policy implementation or improving basic health outcomes. All of these basic elements derived from Brazil’s domestic public health precedent and strong federalist traditions.

The similarities across the two different implementation episodes was in spite of the fact that there had been a dramatic change in government thanks to a military coup in April of 1964, a successful national smallpox eradication campaign during the late 1960s, regional resolutions on polio within PAHO in 1968 and 1971, improved domestic laboratory capacity, and a larger cadre of domestic experts who’d participated in the smallpox campaign and previous polio

³ Hochman, ”Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda.”
initiatives in the early 1960s. The similarities between the two episodes give greater explanatory power to my independent variables, which did not change significantly between the early 1960s and early 1970s.

Public health historian Peter Baldwin has argued that notions of public health culture and precedent can help explain continuity in spite of significant systemic shocks such as political transitions or crisis.\(^4\) Baldwin cites the example of the fall of the Berlin Wall noting that drastic changes in political and economic systems had only minimal effect on public health strategies and policies favored under Communist regimes. Instead, Baldwin suggests that public health culture contributed to the endurance of a range of different institutional formations and norms, concerning public health policies.\(^5\) The continuity in approaches during the first and second implementation episodes in Brazil in spite of a major political shift and significant instability supports Baldwin’s claims.

Additional similarities between the two episodes are related to the weakness of the health system at both national and subnational levels, the limited authority and capacity of the Ministry of Health, and a lack of continuity in priorities and leadership within the Ministry of Health. During both implementation episodes the Ministry of Health provided insufficient technical guidelines and inadequate support to subnational actors. The Ministry of Health was not clearly authorized or capable of developing or enforcing any sort of national guidelines for states to follow. Neither program included surveillance or any sort of evaluation, neither program survived long enough to be adjusted even if data had been available, and neither program was effective in terms of reducing polio incidence or preventing future outbreaks.

\(^4\) Baldwin, *Disease and Democracy: The Industrialized World Faces Aids*, 252.
\(^5\) Ibid.
In contrast to Mexico where the core elements of the basic policy model guiding polio initiatives didn’t change over time and where the core elements provided a strong foundation for subsequent developments in the third implementation episode during the 1980s, the Brazilian program starting in 1980 bore virtually no resemblance to the two pre-1980 initiatives. Rather than providing a foundation for subsequent developments, the pre-1980 experiences provided a solid body of evidence in favor of a developing a dramatically different strategy starting in 1980. The development of a dramatically different strategy was facilitated by a polio epidemic in the late 1970s that increased priority for polio within the Federal Government and demonstrated the persistent failure of existing strategies, changes in Brazil’s domestic capacity throughout the 1970s, and changing domestic conditions at the time of the program’s launch in 1980.

In important factor that shaped the post-1980 campaign was Brazil’s adoption of the Expanded Program on Immunization (EPI) in 1977. The EPI helped reinforce the domestic capacity developments that took place in Brazil during the second half of the 1970s and provided the foundation for the polio campaign starting in 1980. The new strategy starting in 1980 much more closely resembled the Mexican and Cuban programs. The post-1980 program was national in scope with the Federal Government assuming responsibility and authority for providing effective programmatic guidelines and technical support to subnational actors. National authorities coordinated with subnational authorities to adapt the basic guidelines to better suit local conditions. Surveillance was a central component within the post-1980 model and program evaluations were used to adjust the program over time. Surveillance was also used to support a more targeted approach with more intensified efforts and federal intervention focused in areas where coverage remained low.
The survival of the post-1980 strategy was threatened during the political transition and health system reorganization in Brazil in the second half of the 1980s. This was exacerbated by a return to Brazil’s typically high levels of administrative instability within the Ministry of Health. Between 1956 when the Salk vaccine was adopted and the end of the polio eradication initiative, Brazil had 28 different Minister of Health. Ten of those Ministers of Health were in office between 1985 and 1995. The only period with similarly high turnover within the Ministry of Health was between 1956 and 1964. As discussed in chapter six, the period between 1974 and 1985 was highly atypical in Brazil’s contemporary public health history. During the ten-year period there were only two Ministers of Health, each who served a full five-year term. These two Ministers of Health were the only ones to serve their full five-year terms in Brazil between 1950 and 2005. This facilitated the domestic capacity developments and more gradual and incremental changes that lead to the development of the new program in 1980.

However, several core elements of the post-1980 program, such as the use of targeting and overarching authority of the Federal Government and Ministry of Health, were viewed as incompatible with changes underway in the Brazilian health sector favoring dramatic decentralization, a more limited role for the Federal Government, and abandonment of previously targeted efforts. Ultimately, in spite of efforts to alter the strategy and abandon mass immunization campaign in the second half of the 1980s, the Brazilian program and polio progress were sustained thanks in large part to the program’s performance relative to previous strategies, a lack of viable alternatives, and the advocacy of key domestic actors and leaders like Ciro de Quadros within the Pan American Health Organization.
Comparisons Across Independent Variables

Geoepidemiology

Drawing on Peter Baldwin’s work, I have defined the concept of geoepidemiology to include factors such as: where a country was located in the path of a particular epidemic that influenced their potential to learn from the experiences of other earlier hit countries; ease of communication and information exchange between countries; basic topographical features that make nationwide interventions more feasible for some countries than others (islands as opposed to interior territories); migration patterns making some countries more likely destinations for migrants or visitors increasing risk of visitors as vectors; proximity to the source of outbreaks; shared borders. Geoepidemiological effects are by no means fixed. They can change over time and be more or less significant, or significant in different ways, depending on factors such as changes in disease distribution, availability of interventions to combat the disease, and progress (or a lack thereof) made in other nearby countries.

Geoepidemiological effects in Mexico were highly visible during the first two implementation episodes and largely related to Mexico’s proximity to, and 2,000 miles of shared borders with, the United States. During the 1940s and 1950s the United States was not only the focal point for polio epidemics in the Western Hemisphere, it was also the hub of polio and vaccine related research in the region. During the first implementation episode, geoepidemiological factors influenced a strong and preemptive response to polio within Mexico based primarily on the polio threat from the United States. Mexican Federal Government authorities placed entry requirements on U.S. citizens traveling to Mexico during major epidemics in the United States in the late 1940s and early 1950s. The situation reversed itself during the second half of the 1960s as polio was largely eliminated in the United States with the exception of cases reported primarily along the U.S.-Mexico border. Regardless of who was at
risk from whom, the situation helped maintain priority for polio within Mexico over an extended period of time.

Another geoepidemiological effect linked to Mexico’s proximity to the United States concerned information exchange, access to new innovations linked to the Salk vaccine in the mid-1950s, and cross-national collaboration. Mexico had easier and more immediate access to the Salk vaccine and related information starting in 1954-1955 and was less reliant on PAHO or any other intermediary to facilitate information exchange or collaboration. Access to information and innovations, as well as Mexico’s domestic vaccine production and laboratory capacity, help explain Mexico’s early adoption and use of the Salk vaccine relative to other countries in Latin America.

Epidemiological effects were not nearly as influential in Brazil during the first two implementation episodes. Geoepidemiological effects were influential in shaping the Brazilian government’s response to smallpox during the second half of the 1960s, once Brazil became the primary exporter of smallpox cases in the region and the last country in the Americas to eliminate smallpox. However, until the third implementation episode in the 1980s, similar effects were not present related to polio. By the end of the 1970s, Brazil was responsible for the majority of polio cases still reported in the region, which helped to influence the response taken by the Brazilian government in 1980. As several of Brazil’s neighbors made progress in combatting polio within their own borders, the persistence of polio in Brazil became increasingly problematic as imported cases of polio from Brazil were reported in countries like Argentina and Uruguay.
Health Sector Stewardship

Key differences between Brazil and Mexico throughout the first and second implementation episodes were traceable to their differences regarding stewardship and the relative authority and responsibility central governments and Ministries of Health had relative to subnational units. The core elements of stewardship I have focused on include: (1) formulating health policy - defining the vision and direction of national policies; establishing priorities and expected roles and responsibilities of different actors and institutions involved; providing general policy frameworks and guidelines; (2) regulation and oversight - includes establishing rules to “govern the behavior of different actors involved in the health system, and ensuring compliance with them”; (3) collecting and using intelligence - encompasses generating, collecting, and disseminating a wide range of information such as disease surveillance data, evidence from operational research, policy evaluation, and information on innovations or experiences in other countries that can be adapted to suit local conditions.

By the start of the first implementation episode, the Federal Government in Mexico had already been established as the “steward” of the population’s health in Mexico. The Mexican Constitution of 1917 and subsequent sanitary codes specified that the Federal Secretariat of Health (originally called the Department of Health) was the “supreme authority” in matters of hygiene and basic public health. The early establishment of the stewardship role of the Federal Government provided a foundation for subsequent efforts to more clearly define, strengthen, and institutionalize the various stewardship functions performed the Federal Government and Secretariat of Health. This foundation was noted early on by Mexican public health leader Miguel Bustamante who wrote in 1940, “The results of twenty-two years of work by the Federal Health Department promises to mold a nation working for its health and united in a sound health economy.”

6 Bustamante, “Public Health and Medical Care,” 156.
program of disease prevention, health promotion, and medical attention directed toward the fulfillment of the country's duty to give a healthy life to all its people.”

The Secretariat’s authority and capacity increased dramatically during the 1980s with the launch of “second-generation reforms” within the health sector that were explicitly focused on more clearly defining, strengthening, and institutionalizing the stewardship functions provided by the Federal Government. Worth noting is that one of the key actors involved in these second-generation reforms in Mexico, Dr. Julio Frenk, went on to help launch the “stewardship movement” within the World Health Organization in 1998, where he was in charge of the team that outlined the WHO’s subsequent framework on stewardship, prior to returning to Mexico to serve as Minister of Health in 2000. Julio Frenk credits much of the progress made in Mexico, especially starting in the early 1980s, with strong and stable leadership within the Secretariat of Health and a cadre of public health experts with strong research backgrounds that circulated between government and independent research institutions.

In contrast to Mexico, the stewardship role of the Federal Government in Brazil remained poorly articulated throughout the first and second implementation episodes, and even during the third implementation episode to a certain extent. Based on strong federalist traditions and the power and relative autonomy of states, the scope of action and responsibility of the Federal Government was relatively limited throughout the first and second implementation episodes. There was no clear set of health issues the Federal Government was responsible for, no clear regulatory or enforcement authority, and no clearly articulated definition of policies or priorities within the health sector. One of the most common observations made by external advisors and others examining Brazil’s health system during the 1950s and up through the 1970s, was that

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7 Ibid., 161.
8 Author interview with Dr. Julio Frenk, February 6, 2013.
roles and responsibilities of different actors within the health sector and between national and subnational actors, were poorly defined and weakly institutionalized. Additionally, this was a common critique of the new Brazilian Constitution adopted in 1988 and one of the factors cited as continuing to constrain more effective health system development and progress immediately following the reorganization of the health system in 1990.\textsuperscript{9}

Policy Implementation Capacity and Health Service Delivery

The challenges involved in expanding access to basic health services and proven interventions have been a constant theme throughout this dissertation. One of the primary criticisms of the inactive Salk vaccine in the second half of the 1950s, was that, due to its administrative requirements and high cost, this potentially life-saving intervention was only available to a small fraction of the world’s population at the time. Speaking in front of the Second International Conference on Live Poliovirus Vaccines hosted by PAHO in 1960, Dr. Fred Soper reminded conference-goers that as many as 85 million babies were born each year in parts of the world where the Salk vaccine could offer them no protection. He urged his fellow public health leaders and experts to support the alternative live oral polio vaccine on grounds of equity and access, explaining that the characteristics of the vaccine and its low costs, would make it a feasible policy intervention for countries worldwide regardless of their level of development.

However, in spite of the administrative ease and low costs of the vaccine, the evidence from chapter three demonstrated that weak health system capacity related to service delivery and the actual implementation of health policies, prevented greater progress in controlling polio in

\textsuperscript{9} Weyland, "Social Movements and the State: The Politics of Health Reform in Brazil; Marcus Andre Melo, "Unexpected Successes, Unexpected Failures: Social Policy from Cardoso to Lula," in Democratic Brazil Revisited (University of Pittsburgh Press, 2008).
most PAHO Member Nations throughout the 1960s. Cuba was an outlier in the region and effectively expanded access to polio immunization throughout the entire country using mass immunization campaign, volunteer armies, and cooperation from other actors outside of the health sector. Mexico made more progress than most other countries in Latin America during this period of time as a result of comparatively strong health system capacity in urban areas and a rural health services program launched in the 1930s that established rural health units in many smaller rural communities throughout Mexico. However, in spite Mexico’s comparatively strong performance during the first half of the 1960s, Mexico’s health system was limited in scope and many small rural communities remained systematically excluded from immunization initiatives.

Mexico’s comparatively strong performance stood in stark contrast to Brazil’s comparatively abysmal performance during this period of time. Brazil performed worse than virtually any other country in Latin America when it came to basic service delivery during the 1960s and 1970s. Rural access to sewerage services and potable water was lower in Brazil than anywhere else but Haiti and Bolivia during the 1960s. Brazil made slower progress in decreasing infant and child mortality than almost any other country in the region during the period between 1960s and 1970s. It wasn’t simply that Brazil didn’t deliver vaccination services effectively; it was that Brazil didn’t deliver any basic public health or sanitation services effectively.

The persistent weaknesses of Latin American health systems throughout the 1960s and early 1970s meant that by the mid-1970s there were roughly 120 million people in the Americas that did not have access to basic health services. In spite of declarations of “health for all” and the advent of the primary health care movement during the 1970s, implementation and service delivery capacity within most Latin American health systems remained weak. Additionally, in the absence of stronger stewardship functions at the national level, implementation and service
delivery were frequently delegated to subnational actors and institutions that lacked the capacity to either implement national health policies or deliver basic services. Implementation capacity and service delivery also varied significantly within countries and tended to be concentrated in urban areas.

One of the primary objectives of PAHO’s Expanded Program on Immunization starting in the late 1970s was to use the EPI as a sort of vehicle for improving primary health services and expanding access in the region. Champions for the EPI such as Ciro de Quadros argued that the EPI could help to strengthen not only stewardship functions at the national level, but local level health system capacity related to service delivery and implementation of national policies. Among the key health system capacity developments related to the EPI was the identification of a broader range of immunization strategies that could be used to more effectively deliver immunization services to different populations. In areas where there were no permanent health facilities, mobile brigades brought vaccines house-to-house or set up temporary vaccination posts within walking distance of small rural communities. These basic innovations developed within the EPI and during the polio eradication campaign during the 1980s, were subsequently used to expand access to other basic public health interventions such as vitamin A.

In spite of the improvements made as a result of the EPI and other domestic capacity developments during the second half of the 1970s and early 1980s in Brazil, subnational implementation capacity continued to be weak throughout the 1980s and into the 1990s. In many ways, the polio campaigns starting in 1980 were effective in spite of the state of the health system not because of it. Overarching health system reforms in Brazil starting in 1988 linked to the transformation of the Brazilian health system, created as many new problems concerning access and equity, as the reforms were intended to resolve in some ways. According to Kurt
Weyland, an important misconception within the health reform movement in Brazil concerned the positive impact decentralization would have on primary care at the local level. Weyland writes, “In the eyes of the progressive experts, the subnational governments would pay more attention to the basic health needs of the poor because the citizenry could better control them than the distant federal government.”\textsuperscript{10} However, this presumption about the positive effects of decentralization didn’t turn out to be as straightforward as proponents of the health reforms had hoped. Local level health system capacity and service delivery did not automatically improve as a result of the reforms and significant subnational disparities in terms of both outcomes and access persisted throughout the 1990s. Brazil’s immunization program was a constant outlier, effectively reducing inequality in immunization coverage, in spite of the constraints on the broader health system.

In contrast, Mexico’s health system capacity concerning implementation and service delivery improved significantly during the 1980s and throughout the 1990s. Mexico also launched a series of reforms intended to decentralize the health system in the early 1980s. However, the reforms were rolled out very gradually and accompanied by constant evaluation and adjustments. Greater responsibility was delegated to subnational actors only after agreements had been signed outlining state-level investments in health system capacity development and sufficient subnational implementation capacity had been demonstrated. Between 1985 and the end of the De la Madrid administration in 1988, only 14 of Mexico’s 31 states had signed decentralization agreements with the national government.\textsuperscript{11} Based on the results of multiple evaluations of health system capacity in decentralizing states that revealed a decline in access among marginalized communities and insufficient delivery of preventive interventions,

\textsuperscript{10} Weyland, "Social Movements and the State: The Politics of Health Reform in Brazil," 1704-05.
decentralization initiatives were halted by the Salinas administration (1988-1994) that launched a process of recentralization. Studies revealed that coverage among uninsured populations dropped almost 30% in the states that had opted to proceed with decentralization during the 1980s while increasing by 20% in states still covered by the federal programs between 1985 and 1989. Subsequent decentralization efforts were designed with these findings in mind and included greater provisions for ensuring access to care and maintaining the Federal Government’s authority on matters of “community” or “non-personal” health services such as immunization.

**Public Health Precedent and Public Health Culture**

In his work on comparative policy responses to HIV/AIDS, public health historian Peter Baldwin examines the role of public health precedent and culture in shaping the way in which states addressed the disease in different countries. Baldwin’s definition of public health culture includes elements such as relative primacy of individual rights or collective welfare, traditions of voluntarism or state intervention, development of public health legislation, and institutionalized public health norms. Baldwin points to the example of the transformation of communist regimes after the fall of the Berlin wall, noting that drastic changes in political and economic systems had only minimal effect on public health strategies and policies favored under communism, arguing that public health culture contributed to the endurance of range of institutional formations and policies amidst chaos and systemic shocks.

The effects of public health culture and precedent are highly visible in both Brazil and Mexico (and also in the Cuban example) throughout the timeframe covered in this dissertation. In Mexico there was a strong precedent of government intervention in matters of public health, a

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12 Ibid., 90.
13 Baldwin, *Disease and Democracy: The Industrialized World Faces Aids*, 252.
preventive approach to health that included an early emphasis on health education, and a longstanding tradition of community mobilization and participation in public health campaigns. Additionally, Mexico had a highly nationalist tradition whereby Mexican political leaders were cautious of external involvement in domestic health issues and made public health progress a point of national pride. Marcos Cueto writes, “Mexican governments were subject to local pressures to adopt strong nationalistic attitudes and not to rely too heavily on foreign aid. This also meant the existence of a proud local political tradition of Mexico solving social problems by itself.” Mexico’s domestic public health precedent was a driving force influencing polio immunization initiatives throughout all three implementation episodes as well as the subsequent institutional legacies discussed in chapter six.

Brazil’s public health precedent included a limited role for the national government, inconsistent state intervention in public health, strong traditions of subnational autonomy, priority given to diseases or public health issues perceived as directly related to Brazil’s economic development, limited community involvement, and high-profile disease campaigns frequently involving external actors. Gilberto Hochman claims that one of the significant legacies of the smallpox eradication campaign in Brazil during the 1960s was that it contributed to shaping new public health norms in Brazil. This new “culture of prevention” included an expectation of that the state should provide immunization to the public. Additionally, the smallpox campaigns broke with the past in terms of community mobilization and participation, which established an important foundation for subsequent polio initiatives launched during the

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14 Cueto, Cold War, Deadly Fevers: Malaria Eradication in Mexico, 1955-1975, 82.
15 Hochman, "From Autonomy to Partial Alignment: Nationalmalaria Programs in the Time of Global Eradication, Brazil, 1941-1961; "Priority, Invisibility and Eradication: The History of Smallpox and the Brazilian Public Health Agenda."
third implementation episode in 1980.\textsuperscript{16} The “culture of prevention” in Brazil was reinforced by the reorganization of the Brazilian health system starting in 1988, and contributed to the sustained progress made within Brazilian immunization programs throughout the transition.

**Domestic Actors, Policy Advocates, and Communities of Experts**

One of the primary objectives of this dissertation has been to identify and examine some of the causal mechanisms that help explain the cross-national diffusion of public health innovations, especially those related to vaccine preventable diseases. In addition to the influence of “internal determinants” and “prerequisites” (discussed in the previous sections), this dissertation has also demonstrated the influence of more diffusionist factors, such as the influence of the Pan American Health Organization, policy advocates, and transnational (regional) actors networks and communities of experts. Domestic communities of experts, transnational actor networks, and policy advocates have all been influential in shaping both domestic and regional health initiatives throughout the course of this dissertation.

Chapter two demonstrated the role that policy advocates such as Fred Soper, Albert Sabin, and Maurício Martins da Silva played in facilitating the diffusion of the live oral polio vaccine in the Americas during the late 1950s and early 1960s. Transnational actor networks and regional communities of experts similarly helped explain the cross-national diffusion of ideas and innovations related to polio in the region during this early episode. Domestic actors evaluated one another’s experiences using new innovations (both polio vaccines and different immunization strategies) and frequently cited evidence from these “near-peer observations” as having shaped their own adoption decisions.

\textsuperscript{16} “Vaccination, Smallpox, and a Culture of Immunization in Brazil,” *Ciência & Saúde Coletiva* 16, no. 2 (2011).
Chapter five similarly explained how regional actor networks and communities of experts linked to the Expanded Program on Immunization during the 1970s influenced domestic policy decisions. Domestic actors participated in evaluations of one another’s programs through the EPI’s multi-disciplinary program evaluations, provided feedback on one another’s National Plans of Action during regional EPI manager’s meetings, and had an enormous amount of current information available on the experiences and innovations of other countries in the region thanks to the *EPI Newsletter* and other PAHO publications.

In this regard, EPI training workshops and information-exchange forums, specifically at the regional level, resembled Donald Schön’s notion of “magnet models” of diffusion whereby actors from different places are brought to a central entity and exposed to new information and innovations. PAHO and regional EPI forums served as “magnets” and exposed senior immunization officials with decision-making authority from every country in the region, to the same basic training materials, ideas, and innovations. National EPI leaders returned to their own countries and subsequently organized national and local EPI training workshops, adapting the material received from the “magnet,” to suit local conditions. In this way, the “magnet model” effectively facilitated a broad diffusion of EPI-related programmatic norms at both regional and national levels.

In addition to information from other countries and the influence of regional actor networks and communities of experts, domestic communities of experts played an important role in shaping domestic policies in Mexico and Brazil at different points in time. The role of domestic communities of experts was far more visible in Mexico over the course of the three different implementation episodes and was cited as a primary factor helping to explain the relative effectiveness of Mexican immunization initiatives over time. Mexico had a well-
educated, well-trained, and well-connected domestic community of experts at the start of the first implementation episode. More importantly in terms of the extent to which domestic communities of experts influenced domestic policies, Mexico’s domestic communities of experts included overlapping actors network that linked leading Mexican researchers to public health officials. These overlapping networks and the circulation of Mexican public health elites between institutions and government agencies facilitated collaborations between researchers and policymakers as well as increased the influence domestic communities of experts had on the health policy process. This was especially visible and influential during the 1980s during the third implementation episode.

In Brazil, the influence of domestic communities of experts was far less visible or less consistent until the third implementation episode during the 1980s. During the first implementation episode during the early 1960s, there was a solid domestic community of experts who were heavily involved in the decision made to adopt the live oral polio vaccine in 1961. Key actors during this period included: Paulo de Góes, Director of the Institute of Microbiology in Rio; José Martinho da Rocha, one of Brazil’s most prominent pediatrics experts; Maurício Martins da Silva, PAHO’s polio advisor and a Brazilian pediatrics expert; and Joaquim Travassos da Rosa, the Director of the Oswaldo Cruz Institute in the early 1960s. These actors were well known and well connected both inside and outside of Brazil and all had leadership roles in the decision to adopt the live vaccine and launch the first mass immunization campaign to combat polio in the early 1960s. However, after the military coup in 1964, the influence that Brazil’s domestic communities of experts had on domestic policy was extremely limited. Chapters three and four highlighted the antagonistic relationship between domestic communities of experts and the Brazilian military regime between 1964 and 1974. The situation began to shift
in the mid-1970s with the period of “enlightened authoritarianism” that helped to create new links between domestic communities of experts and the policy process. The effects of this shift were immediately visible in 1980 during the third implementation episode whereby Brazil’s domestic experts were highly influential in designing the new program that effectively controlled polio in Brazil in the 1980s.

**International Influence and External Actors**

One of the primary objectives of this dissertation has been to examine how interactions between domestic factors and conditions and external actors and influences, shape domestic policy processes. In pursuing this line of inquiry my research has been heavily influenced by scholars such as Steven Palmer, Gilberto Hochman, Marcos Cueto, and Kurt Weyland. The primary commonality between these scholars is that they all challenge assumptions of unidirectional transfers of knowledge or impositions of new innovations from North to South, or from international organizations down to domestic actors in developing countries. Instead, they explain domestic social policy developments in Latin America (both past and present) as the product of dynamic interactions between domestic and external factors, whereby external actors and organizations may influence but in no way determine domestic policy outcomes.

In his work on social policy diffusion in Latin America, Kurt Weyland has argued that the “distinction of external vs. internal agency” is much more blurry than commonly portrayed in contemporary diffusion scholarship, especially within the field of International Relations.¹⁷ Throughout the course of his interviews with Latin American policymakers, Weyland found that domestic actors within his case studies often used the role and influence (specifically “external

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conditions” placed on governments by IFIs) of external actors and agencies as a way to leverage support for their own agendas and policy positions.18 Similar interactions between domestic and external actors are present at different points in time across the cases presented in this dissertation.

During the second half of the 1980s when Brazil’s polio campaign came under attack from prominent domestic healthcare reformers, key actors such as Dr. João Baptista Risi Jr., were able to use the role and influence of external actors such as PAHO or PAHO’s Technical Advisory Group (of which Risi was a member) to leverage support for the campaign within the Ministry of Health. A similar example can be seen in Mexico during the mid-1980s as well involving Mexico’s Vice-Minister of Health Jesús Kumate who was also a TAG member. After planning for polio campaigns had been derailed by massive earthquakes in September of 1985, Kumate invited members of Rotary International’s Taskforce to attend planning meetings at the SSA to fuel renewed priority for polio and planned Mexico’s first National Immunization Days in 1986 to launch the day after a TAG met in Mexico City. As a result, all of the TAG’s members as well as well as representatives from the Inter-Agency Coordinating Committee and other Latin American EPI managers were on hand to observe the first round of NIDs. External actors or organizations did not pressure the domestic actors in either example, but rather, domestic actors in both cases used the influence of external actors as leverage to mobilize domestic support for pre-existing priorities and programs.

An additional finding of this dissertation, that again echoes Weyland’s work, is that external actors and organizations had the most significant influence in domestic policy processes, not through “power and leverage,” but through the provision of information. Weyland describes this as “availability enhancement” whereby domestic policymakers are exposed to information

18 Ibid.
concerning new innovations or ideas in other countries that subsequently can influence policy decisions by increasing the amount of information available to domestic policymakers. One of the primary ways that PAHO influenced domestic policy decisions in the region starting in the 1950s was through the generation, collection, and circulation of information. An example from the diffusion of polio vaccines in chapter two helps illustrate this point.

During the second half of the 1950s domestic actors in the Americas were presented with a decision regarding two different possible interventions to address the same problem (polio). In spite of the fact that the Salk vaccine was actively championed by powerful actors in the United States and used exclusively in the United States until 1961, Latin American public health officials, by and large, adopted an alternative live oral polio vaccine that was more compatible with their own domestic conditions and about which there was more readily available and applicable information. In addition to circulating information concerning the limited effectiveness of Salk vaccine in the Americas and its extraordinarily high costs, PAHO provided an enormous amount of information on its preferred alternative, the live oral polio vaccine. PAHO’s director and his surrogates traveled throughout the Americas providing information about the live vaccine to public health officials, coordinated demonstration projects involving the vaccine in Latin American countries to generate new information for policymakers, and organized two international conferences on the live vaccine to further increase the circulation of information on the vaccine.

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19 Ibid.
The Hybridization of the Pan American Health Organization

One of the primary objectives of this research has been to examine the extent to which the two different ideal-type diffusion models proposed by Everett Rogers explain the empirical reality observed in the Americas related to the diffusion polio vaccines and immunization initiatives. Ultimately, neither purely decentralized nor centralized models explained the observed variation in the Americas between the late 1950s and 1990s. The following sections summarize the hybridization of the Pan American Health Organization starting in the late 1940s. This overview is followed by a more detailed summary of the four key elements of the two ideal-type centralized and decentralized diffusion systems and how they were combined into a more hybrid model.

The Pan American Sanitary Bureau (PASB) is the oldest international health organization in the world still in existence today. Established in 1902 it predates the World Health Organization (WHO) by over 45 years. Prior to the 1940s the Bureau existed largely as an idea or ideal of inter-American collaboration primarily to protect inter-American commercial interests. During this period of time it was highly centralized and heavily reliant on the United States for funding to support projects and to provide the majority of the Bureau’s professional staff. However, in spite of the fact that it was highly centralized, the actual centralized functions performed by the Bureau were inadequately institutionalized in many ways and did not reflect the needs or priorities of the majority of the Bureau’s Latin American Member Nations.

The Bureau was dramatically reorganized in 1947 to facilitate greater participation and representation of Latin American officials and public health leaders for the first time in the Bureau’s history.\(^{20}\) Between 1902 and 1947, virtually all full-time professional staff at the Bureau, including the Bureau’s directors, were provided (on paid loan) by the United States.

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Public Health Services (USPHS). Additionally, the Bureau’s first three directors, Walter Wyman (1902-1911), Rupert Blue (1912-1920), and Hugh Cumming (1920-1947), were all sitting United States Surgeon Generals during their respective tenures leading the Bureau. In 1947 Dr. Fred L. Soper was unanimously elected to replace Dr. Cumming, marking the first time that the Director of the Bureau was not a sitting U.S. Surgeon General and in fact had never been a USPHS employee.21

Starting at the end of the 1940s with the election of Fred Soper as Bureau Director, the Bureau began a process of decentralization and Latin Americanization, with the needs of Latin American members increasingly driving the Bureau’s work.22 Marcos Cueto explains that prior to second half of the 1940s resolutions passed during the Bureau’s regular Sanitary Conferences “were basically recommendations for the Member Governments.” However, starting in the late 1940s, “the meetings decided on the actions that the Bureau itself should undertake, with the countries’ consent.”23

Throughout the 1950s, Director Soper simultaneously worked to decentralize the Bureau’s work while also strengthening the centralized functions the Bureau provided to its Member Nations. This was when a sort of hybrid system first began to emerge. Dr. Myron Wegman, who worked with Fred Soper at PAHO starting in 1952, explained that there were “two major avenues of activity” for an organization such as PAHO. The first avenue was to work with all of the member nations to provide “centralized functions” which included things like collecting and circulating vital statistics, serving as a clearinghouse for new information, providing overarching technical guidelines and program standards, and “contributing broadly to

21 Ibid., 74.
22 Leys Stepan, Eradication: Ridding the World of Diseases Forever?
research and resource development.” Centralized functions included those things that “no single country or even small group of countries can carry out efficiently for an area which covers a hemisphere, or the entire globe.” Many of the centralized functions of the Bureau were outlined in the Pan American Sanitary Code in 1924. However the second avenue of activity was slightly more complicated.

Wegman writes that the second “avenue of activity” is to facilitate technical cooperation with individual countries in order to bring “new techniques not readily available within their own boundaries,” and in the process enable cross-national exchanges of information and experiences among health workers. In contrast to the more permanent nature of the centralized functions performed by PAHO, technical cooperation was meant to be temporary. The overall objective of PAHO’s technical and advisory work was to help strengthen domestic capacity so that that individual governments and not supranational organizations were the stewards of public health in their respective countries. Wegman summarizes PAHO’s approach to technical cooperation stating: “Put in current vernacular, there is no place for empire building.”

Chapter two demonstrated that the Bureau’s centralized functions during the 1950s and early 1960s were well suited to facilitating diffusion through the circulation of new ideas and innovations, providing direct technical cooperation through the work of PAHO consultants, and organizing demonstrations of new innovations as in the case of the live poliovirus vaccine studies. However, during the early 1960s, beyond helping to facilitate adoption decisions, what each country did after adoption was beyond the scope or capacity of PAHO’s technical cooperation during the 1960s.

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25 Ibid.
26 Ibid.
27 Ibid.
The Pan American Health Organization was in many ways overly decentralized during the 1950s and 1960s when the domestic capacity of each Member Nation was not sufficient to implement many of the initiatives articulated in PAHO resolutions. Moreover, the basic strategies promoted by PAHO under Abraham Horwitz in the early 1960s, were largely derived from the successful experiences of more advanced industrialized countries. For example, Dr. Horwitz consistently championed routine immunization services when Latin American health system capacity was not sufficiently well developed to effectively deliver these routine services or make them available to more than a fraction of the population.

Chapter four demonstrated that PAHO attempted to recentralize some of its polio-related work at the end of the 1960s based on the limited progress made in domestic programs throughout the 1960s and in response to the needs of Member Nations. However, the changes during the late 1960s and early 1970s were relatively superficial and not translated into a more coordinated program of technical support. Starting in the mid-1970s a more effective combination of decentralized and centralized systems emerged under the directorship of Dr. Héctor Acuña (1975-1983).

Chapter five demonstrated that the emergence of a hybrid system was facilitated by stronger domestic capacity among PAHO Member Nations and a reevaluation of PAHO’s role and responsibilities as a result. PAHO began to redefine its role in the region to focus more on the stewardship functions the Organization could provide for all Member Nations to facilitate continued capacity development among PAHO Member Nations, especially focused on developing strong adaptive capacity. The following sections summarize the basic characteristics of Everett Rogers decentralized and centralized ideal-types and outline the hybrid system discussed in chapters two and five.
The Sources and Origins of Innovations

One of the key differences between centralized and decentralized diffusion systems concerns the sources and origins of innovations and new information. As discussed in chapter two, the sources of innovations and new information concerning the live oral polio vaccine were influential in driving cross-national diffusion of the vaccine in the Americas during the late 1950s and early 1960s. Latin American actors were actively involved in generating research related to live poliovirus vaccines and their practical application, and public health officials in developing countries frequently cited one another’s experiences with the live vaccines as well as the experiences in countries like the Soviet Union, as having influenced their adoption decisions.

Chapter five demonstrated that the innovations linked to the Expanded Program on Immunization (EPI) in the late 1970s were developed by public health officials and researchers from the Americas. Additionally, starting in the 1970s there was a clear consensus within PAHO that the solutions to public health problems in Latin America should come from Latin America, with greater emphasis on research conducted and innovations created by Latin American actors within Latin American institutions. The argument made by key actors such as PAHO Director Héctor Acuña during this period of time was that greater progress in public health in the region had been stymied by an over-reliance on imported technologies and models developed for and used in more advanced industrialized countries with inadequate attention to the needs of local communities and domestic contexts. Acuña championed operational research conducted by Latin American actors and the need for stronger adaptive capacity in countries throughout the region.
Acuña explained that developing countries needed to “adapt external methods and technologies to their own conditions or invent new ones to meet their requirements.”

Instead of the purely decentralized system were the sources of innovation come largely from experimentation among local users within a diffusion system, and also in contrast to centralized systems where the sources of innovations are formal R&D conducted by experts who are not also users of the potential innovation, the experiences in the Americas is a combination of the two models. Latin American experts who were also potential adopters (public health officials) actively participated in the creation of new innovations related to polio and immunization in the regions throughout the period of time covered in this dissertation. PAHO played an important role in facilitating collaborative research and supporting operational research conducted by Latin American actors, emphasizing that the origins of innovations adopted to solve Latin American health issues would be most effective if they came from Latin America and research done by Latin Americans.

The Direction of Diffusion

Another distinction between centralized and decentralized systems is the direction of diffusion with centralized diffusion involving top-down diffusion from experts to local “users” and decentralized diffusion involving peer-to-peer diffusion of innovations through “horizontal networks.” Chapter two examined the influence of “near-peer observations” and regional actor networks on domestic polio vaccine adoption decisions in Latin America during the late 1950s and early 1960s. The historical evidence from this period suggests that personal and professional networks were influential in driving live polio vaccine diffusion in the region, with the

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29 Rogers, Diffusion of Innovations, 396.
experiences of previous adopters in other Latin American countries influencing decisions not to adopt the Salk vaccine and positively influencing live vaccine adoption decisions. Rather than being overly influenced by the top-down promotion of the Salk vaccine by powerful actors and interests within the United States, Latin American adoption decisions were largely shaped by experiences and information communicated within the region through horizontal networks and exchanges facilitated by PAHO.

Chapter three demonstrated that there was a disconnect within PAHO during the early 1960s concerning the implementation structures promoted by PAHO under the direction of Dr. Abraham Horwitz (1959-1975). Rather than learning from Latin American experiences, Dr. Horwitz championed the models developed in and used by more advanced industrialized countries. More specifically, Horwitz championed routine immunizations conducted as part of broader comprehensive health services, as opposed to mass immunization campaigns that frequently relied on volunteers and the use of public spaces where health facilities were unavailable. Horwitz cited the success in the United States in combatting polio using routine services as a model for the region. However, as the case studies in chapter three demonstrated, institutional capacity in countries throughout the region was inadequate to control, let alone eliminate, polio using the same strategies as had been used in the United States or other advanced industrialized countries.

As discussed in chapter four and in more detail in chapter five, during the late 1960s and more clearly in the 1970s there was a shift within the Americas that was articulated within PAHO as Technical Cooperation among Developing Countries (TCDC). This explicitly shifted the direction of diffusion promoted by PAHO in favor of more south-south learning and cooperation. Héctor Acuña explained the source of the shift stating, “The normal flow of
technology and research has been from the developed to the developing countries, but this practice has ignored the customs, traditions, and most importantly, the needs of the people.”

PAHO explained that TCDC, “focuses on development programs, projects, and activities in which major inputs such as know-how and expertise, consulting service, training programs, equipment, and supplies are provided by developing countries to one another.” Writing in 1977, to commemorate PAHO’s 75th anniversary, Acuña explained, “These patterns of technical cooperation among developing nations are traditional in the Region of the Americas. Their present significance lies in their systematic and formal use as an instrument for collaboration among the countries of the Hemisphere.”

While more horizontal or south-south diffusion and exchange had previously been an ideal within the Pan American Health Organization, starting in 1977 the ideal institutionalized. Horizontal and south-south diffusion that was centrally coordinated is another characteristics of the proposed hybrid model in the Americas.

The direct effects of this shift within PAHO were examined in chapter five related to the development and diffusion of the Expanded Program on Immunization (EPI) and polio eradication campaign in the late 1970s and throughout the 1980s. Chapter five demonstrated that Latin American public health officials didn’t look to more advanced industrialized countries to emulate their policy models when it came to immunization starting in the 1970s, instead Latin American public health officials increasingly looked to one another as well as their own public health experiences, to inform domestic policy decisions. Additionally, the innovations adopted and deployed within the regional polio campaign throughout the 1980s, were almost entirely from Latin America. Countries borrowed different pieces of programs developed in other

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similarly situated countries in the region while also adapting external models to better suit domestic conditions and local contexts.

**How Important are User Needs in the Innovation Diffusion Process?**

Another key distinction between decentralized and centralized systems concerns the extent to which the needs of potential adopters drive the innovation development and diffusion process. Rogers suggests that the specific needs of potential users of an innovation are not significant in driving diffusion in centralized systems that are primarily innovation-centered with diffusion driven by the existence of a new innovation rather than the needs of potential adopters. In contrast, in decentralized systems, there is what Rogers defines as a “problem-centered approach” driven by the needs of potential adopters.

As chapter two explained, one of the biggest criticisms of the Salk vaccine within Latin America was that it was entirely out of touch with the needs of potential Latin American adopters. Based on its administrative requirements, cost and availability, and the age group for which it was initially proven to be effective, there was very little about the Salk vaccine that matched the needs of Latin American users. The diffusion process behind the Salk vaccine was driven by the existence of the vaccine itself (an innovation-centered approach) rather than by the needs of potential users beyond the United States and other advanced industrialized countries.

In contrast, when the World Health Organization endorsed large-scale field trials for the live oral polio vaccine in July of 1957, one of the primary justifications cited by the WHO was the need in countries where the Salk vaccine was not a viable solution. The needs of public health officials in developing countries continued to be a driving force behind the live vaccine development throughout the remainder of the 1950s and early 1960s.
As discussed previously, the period during the 1960s covered in chapter three, demonstrated a period of tension between the approaches promoted by PAHO and the actual needs and capabilities of Member Nations. Chapter four demonstrated that, towards the end of the 1960s PAHO began adjusting its recommendations to more accurately reflect the realities in most Latin American countries. Specifically, starting in the late 1960s and early 1970s, PAHO began proposing a broader range of strategies to increase immunization coverage in the absence of stronger health system capacity, thereby more effectively addressing the needs of PAHO Member Nations.

A strong return to the “problem-centered approach” promoted by Fred Soper at the Bureau between 1957-1959 occurred with the change in leadership from Abraham Horwitz to Héctor Acuña in 1975. Throughout the 1960s “applications of technical progress” in Latin America did not produce the same benefits that had been observed in more advanced countries where the technologies had originally been developed. Acuña stated, “It is not enough for an effective vaccine to exist if it cannot be used, or if prevailing human and environmental factors cause it to be used improperly.” Based on the experiences of the 1960s and first half of the 1970s, during the second half of the 1970s the idea of “appropriate technology” came to dominate PAHO’s overarching approach to technical cooperation. Acuña defined “appropriate technology” as “technology designed solely to respond to the needs of the people.”

Appropriate technology developed to respond to the needs of potential adopters was a core concept within the development of the EPI and polio campaigns during the late 1970s and 1980s discussed in chapter five. According to EPI director Ciro de Quadros the EPI was never paternalistic or top-down in any way, but rather provided a series of tools for domestic actors that empowered domestic public health officials to develop their own immunization programs.

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33 Acuña, Toward 2000: The Quest for Universal Health in the Americas, 84.
De Quadros cites the fact that the program was something that domestic actors already wanted but had been unable to accomplish entirely on their own, as the key factor explaining the rapid diffusion of the EPI in the region. The fact that the EPI was user-driven and that Member Nations were involved in the development process from the very beginning appears at first to be inline with Rogers’ decentralized diffusion model. However, PAHO played an absolutely essential role in coordinating the development and diffusion of the EPI throughout the entire process.

Starting in 1975 PAHO provided a series of centralized functions and innovations to Member Nations that were central to the EPI’s effective adaptation, implementation, and institutionalization in countries throughout the region. PAHO’s Revolving Fund is a prime example of needs driving innovation and the importance of central coordination. It is also an example of how PAHO facilitated greater decentralization by providing an additional centralized function. Everett Rogers writes, “User self-reliance is encouraged in a decentralized system.”34 PAHO effectively encouraged and facilitated user self-reliance through the Revolving Fund by making it more feasible and less expensive for Member Nations to assume greater responsibility for their national immunization programs. The Revolving Fund helped make Latin American countries among the least dependent in the developing world on donor funding or foreign aid for immunization financing with the vast majority of funding for EPI and polio campaigns coming from domestic governments themselves.

The central role that “user needs” played in driving the diffusion process in the Americas related to polio vaccines and immunization initiatives supports a similar “needs-driven” argument made by Kurt Weyland in his work on social policy diffusion in the Americas. Weyland writes, “Contrary to sociological institutionalism and constructivism, policy diffusion

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34 Rogers, *Diffusion of Innovations*, 398.
has not resulted from solutions chasing problems, but from problems creating receptivity for solutions.” The empirical evidence presented in the case studies throughout this dissertation supports Weyland’s argument.

The importance of user needs in driving diffusion was one of the issues most commonly cited among key actors I interviewed. Dr. Samuel Katz developed the measles vaccine, worked alongside Dr. John Enders who won a Nobel Prize for polio research in 1954, and is one of the world’s foremost experts on vaccines and vaccine preventable diseases. He is also one of the key actors involved in the current global measles eradication initiative and served as the director of the GPEI’s Research Advisory Commission starting in 2008. Dr. Katz suggests that one of the reasons why the global polio eradication campaign has not yet succeeded in eradicating polio is due the origins of the campaign and the disconnect between the global initiative and the needs of many developing countries. Dr. Katz explains that in the remaining polio endemic countries (specifically Nigeria, Pakistan, and Afghanistan) the GPEI is viewed as a WHO initiative that is being pushed on to countries from the West (the United States) in a top-down fashion that has increased resistance to the GEPI within local communities. Katz explains that, in general, the GPEI was not derived from countries like Pakistan and Afghanistan, and that this top-down approach has constrained the progress of the GPEI. Katz says, Latin America is a good example that the initiative must come from the bottom-up not top-down in terms of management and administration.36

35 Weyland, Bounded Rationality and Policy Diffusion, KL4808-09.
36 Author interview with Dr. Samuel Katz, November 15, 2012.
Reinvention and Adaptation

According to Rogers, centralized diffusion systems are characterized by minimal innovation reinvention or adaptation during the diffusion process, whereas reinvention is a key aspect of decentralized diffusion systems. According to Julio Frenk, Mexico’s Minister of Health from 2000-2006 and the founding director of the Center for Public Health Research in Mexico in 1984, adaptation is a critical aspect of policy diffusion and effective implementation, and one that is frequently neglected by domestic public health officials and international organizations. Frenk suggests that adaptive capacity is essential for the translation of best practices developed in one country, into successful policies that are well suited to the domestic conditions in another. He explains that the most successful countries in terms of adaptive capacity are “those that have the institutional capacity to identify, access and locally adapt, knowledge that is accessible as a global public good and then adapt it to local circumstances.” Frenk explains, “That this is partly a research capability. A lot of research is about new knowledge but a lot of research is about adapting knowledge that already exists to fit local capacities.”

According to Dr. Frenk, facilitating adaptive capacity is the most essential function international organizations like PAHO and the WHO can provide, and one that PAHO has traditionally provided more effectively than any other WHO region or the WHO itself. Frenk explicitly outlines the need for a strong coordinating center to facilitate more effective decentralization, again supporting the argument in favor of the proposed hybrid model.

Chapters three and four demonstrated that Cuba and Mexico both had comparatively strong adaptive capacity in the 1960s. Cuba’s polio model was based in part on an adaptation of models developed in the Soviet Union and Czechoslovakia. Both countries where mass campaigns had been used to control and eliminate polio using the live polio vaccine had far more

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37 Author interview with Dr. Julio Frenk, February 6, 2013.
advanced health system infrastructure than Cuba, pre-existing health facilities where immunizations could be administered, and large numbers of trained personnel who could administer vaccines. Cuba effectively adapted the basic ideas behind the two campaigns and similarly used mass organizations to promote the campaigns, however Cuba’s innovation was developed to reflect existing conditions on the island in the early 1960s that included Cuba’s resources as well as constraints. Cuba didn’t have the option of using trained health personnel or existing health facilities, but Cuba had a highly mobilized population and active and omnipresent mass organizations. Additionally, there was no practical reason why trained health personnel were required to administer an oral polio vaccine that was given in candy or sugar cubes. Volunteers with only a minimal amount of training could easily administer the vaccines going house-to-house to ensure that those populations without access to health facilities received the vaccine either way. Cuban public health officials had easy access to information about the Soviet and Czech experiences based on their increasingly close relationships with the two countries, and Cuban public health officials were also well connected to other Latin American actors through their active participation in PAHO.

Mexican public health officials adopted and adapted the Cuban model of using mobile brigades to bring vaccines house-to-house. While in Mexico this strategy was neither necessary nor feasible throughout the entire country, in the late 1960s its selective use enabled Mexican public health officials to expand access to immunization in areas that previously been excluded from immunization services. Mexico’s adaptive capacity can also be seen in the late 1950s and early 1960s with the early adoption of the Salk vaccine. Mexican actors had greater access to information about the Salk vaccine than other Latin American actors based on Mexico’s proximity to the United States and, what Julio Frenk explains as the “connectedness” of domestic
actors in Mexico. Mexico did not need PAHO to facilitate information circulation regarding the Salk vaccine or live oral polio vaccine due to the fact that Mexican actors during the 1950s and 1960s were extremely well connected with or without PAHO’s help.

Starting with the directorship of Fred Soper in the late 1940s, PAHO increasingly articulated its mission as facilitating diffusion and the development of domestic adaptive capacity within the region. The emphasis on adaptation and reinvention is consistent with Rogers’ decentralized model, however reinvention and adaptation were actively facilitated by a central coordinating body, which again supports the more hybrid explanation argued in this dissertation. PAHO’s Annual Report for 1954 explained:

In its basic policy of strengthening national health departments the Bureau is not itself an operating agency. It is a clearinghouse as well as a coordinating and stimulative center for government health authorities in all the countries of the Western Hemisphere…The consultants provided by the Bureau work hand in hand with the health departments. Frequently they are themselves public health officers in the health department of another country. What the Bureau especially aims to do is to give every country the benefit of the experience of every other country.  

PAHO facilitated adaptive capacity development starting in the 1950s through training and education, facilitating information circulation and increased communication among actors in the region, and supporting the development of domestic research institutions.

During the 1950s there was increased emphasis placed on sending PAHO-supported fellows to study in other Latin American countries instead of the previous practice of sending fellows to study in the United States, Canada, or Europe. Throughout the 1960s and 1970s the percentage of fellows studying in other Latin American countries increased dramatically while the number being sent for study in the United States declined. PAHO stressed that domestic actors who received training abroad had to critically evaluate the information they acquired in order to more effectively translate it back to their own domestic situations. The shift in favor of

sending actors to study at other Latin American institutions was intended to facilitate easier translation of new information gained abroad into effective domestic programs at home.

Stronger domestic communities of experts and greater connectivity between domestic communities of experts in different countries also facilitated increased local adaptive capacity. In this area, PAHO actively worked to increase communication channels and connections among researchers within the Americas in order to increase the amount of information available to domestic actors in the region. During the late 1960s PAHO reports began referring to the emergence of an “intellectual common market” in the Americas related to increasing communication channels, overlapping actor networks, a stronger regional community of experts, and improved mechanisms for circulating information.

A key aspect of the Expanded Program on Immunization and polio eradication campaign discussed in chapter five was the amount of reinvention that occurred throughout the diffusion process as domestic actors adapted policy models to better suit the needs of domestic communities and match local conditions. From the very beginning of the regional polio campaign, domestic public health officials were actively encouraged to adapt and adjust the core elements of the polio eradication model as needed. However, unlike a purely decentralized model, PAHO officials as well as domestic actors within national ministries of health, facilitated adaptation to ensure that the core aspects of the innovation were sustained during the adaptation process. Additionally, PAHO as well as domestic ministries of health, helped to facilitate the development of adaptive capacity by increasing the amount of information available to domestic policymakers and public health officials, providing training, and facilitating program evaluations to assess the effects of adaptations on program outcomes.
The evolution of the EPI after its formal launch in October of 1977 was an extremely dynamic process. Unlike in a centralized system or Donald Schön’s “center-periphery” model, whereby an innovation is assumed to exist in its final or “optimal” state prior to diffusion, the diffusion associated with the EPI in the Americas was characterized by continuous adaptations and reinventions made at both national and subnational levels. The EPI evolved through a sort of cyclical process whereby domestic experiences were regularly circulated vertically back to PAHO staff and horizontally among actors in other countries. At the regional level PAHO staff were explicit that the development of the EPI and its effective adaptation as the program advanced, required a multi-directional flow of information between PAHO and PAHO Member Nations and among the Member Nations themselves. PAHO staff did not view the innovations associated with the EPI as already existing in their optimal form at the time of the program’s launch. On the contrary, PAHO staff constantly emphasized the fact that many aspects of the program would and should be adapted by domestic actors according to their needs and existing resources. PAHO officials and domestic actors alike viewed the flexibility of the EPI as one of its primary strengths.

When PAHO’s Technical Advisory Group (TAG) outlined the proposal for a regional polio eradication campaign, one of the factors supporting the proposal was that Member Nations had developed sufficient adaptive capacity required to effectively adapt a series of policy models and immunization strategies thereby making it possible to immunize previously unreached populations, which would be required to effectively eliminate polio. This supports Rogers’ claims that reinvention and adaptation can be positively associated with both the pace of

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diffusion and the extent to which innovations are effectively implemented and sustained over time.40

**Intended Consequences and Institutional Legacies**

The final questions examined by this dissertation concern the longer-term consequences of innovation diffusion and whether consequences vary depending on the variations identified throughout the body of this dissertation concerning domestic conditions, external factors, and decentralized versus centralized diffusion models. Everett Rogers defines consequences as, “The changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation.”41 Rogers explains that there are different ways to classify consequences including anticipated and unanticipated consequences, and classifying consequences according to whether they increase or decrease equality among members of a social system.42 Rogers writes, “How an innovation is introduced determines, in part, the degree to which it causes unequal consequences.”43 Rogers explains that consequences have been understudied within the field of diffusion research. He suggests this in part because consequences are difficult to measure and are often “confounded with other effects,” and therefore are most effectively examined through observations of complex process that unfold over time, or through in-depth case studies.44 One of the primary contributions of this dissertation is that does both.

PAHO’s technical cooperation and work with its Member Nations dating back to the late 1940s, has been explicitly focused on generating long-term consequences at both national and

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40 Rogers, *Diffusion of Innovations*.
42 Ibid.
43 Rogers, *Diffusion of Innovations*, KL8094-95.
44 Ibid., KL7658.
regional levels. The clear distinction of roles and responsibilities between PAHO and its Member Nations has been essential in this regard. Writing in 1954, PAHO Director Fred Soper explained, “The Pan American Sanitary Bureau is not an end in itself but an intermediary which seeks to strengthen the health efforts of each member nation. In the final analysis only governments have police power, and only governments can enact laws, levy taxes, and apply these resultant funds in a way that will lift health work out of the temporary stage and build it into the permanent structure of the State.”

The longstanding objective of producing positive long-term consequences provided the foundation for PAHO’s subsequent work in the region, however during the 1960s PAHO and PAHO Member Nations struggled to find an effective balance between progress and patience and ideals and their effective institutionalization into viable health programs.

The change in PAHO’s directors from Fred Soper to Abraham Horwitz in 1959 marked a shift in ideology within PAHO, in favor of more comprehensive approaches to health and development. At the same time, PAHO actively promoted the decentralization of the Organization’s work. However, as the examples in chapters three and four demonstrated, this ideational shift was not well matched to the institutional capacity of many Latin American nations. The change in direction promoted by Dr. Horwitz, combined with the insufficient institutional capacity of Member Nations, created what Rogers refers to as “disequilibrium” within the social system of the Americas. Rogers explains that, “Disequilibrium occurs when the rate of change is too rapid to permit a social system to adjust.”

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disorganization that accompanies disequilibrium marks it as a painful and inefficient way for change to occur in a system. 

The consequences of disequilibrium were visible in Brazil (and to Mexico to a lesser extent) during the early 1970s related to mass polio immunization campaign and the abrupt shift to routine immunization services between 1971 and 1974. When the National Polio Control Program was launched in 1971 it was launched without accounting for the limited capacity of subnational health institutions in many Brazilian states. The NPCP introduced a new immunization campaign without sufficient support from the Ministry of Health and left implementation up to subnational authorities. This limited the effectiveness of the NPCP resulting in its abandonment after only two years. The new routine immunization strategy adopted by Brazilian authorities in 1974 was similarly ill suited to existing domestic capacity whereby the health system lacked the capacity to adapt or sustain the changes adopted by the Ministry of Health.

The dramatic changes promoted by PAHO during the 1960s did not permit the social system to adjust and were ultimately neither successful nor sustainable. PAHO Director Héctor Acuña explained that the disconnect between ideals and institutions throughout the 1960s and early 1970s produced a sort of “systemic crisis” for the region’s health systems. Acuña attributed part of the crisis to deficiencies in existing practices, especially concerning the organization and delivery of health services that were, in many cases, based on models and policies developed and used in advanced industrialized countries. The systemic crisis produced by the disequilibrium of the 1960s and early 1970s, created a window of opportunity for the hybridization of the Organization and shift in approaches to health and cooperation, described in chapter five.

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47 Ibid., KL7928-29.
Changes within PAHO and PAHO Member Nations during the 1960s and 1970s related to the institutional capacity of all parties involved, facilitated the emergence of a more dynamic equilibrium within the Americas starting in the second half of the 1970s. The best example of this comes from the development linked to the Expanded Program on Immunization (EPI). In his discussion of consequences Rogers writes, “Dynamic equilibrium occurs when the rate of change in a social system is commensurate with the system’s ability to cope with it…it occurs at a rate that allows the system to adapt to it.” 49 Changes within a social system are more sustainable if the system is able to adapt to them.

In 1978 the Annual Report of the Director acknowledge this issue stating, “Like any fine mechanism, a good immunization program takes time and skill to construct and once built it can break down if the least of its parts falters.” 50 In developing the EPI, key actors such as Ciro de Quadros explicitly sought to achieve dynamic equilibrium within the diffusion process as countries in the region adopted and implemented the different components of the broader program. To facilitate this process the EPI was explicitly designed to proceed in different, but interrelated stages, with regional, national, and subnational actors acquiring mutually reinforcing sets of capabilities and allowing the system (national health systems) sufficient time to adapt to the changes.

As a result of this dynamic equilibrium the consequences of the innovation diffusion process related to the EPI and later polio campaign were not only sustainable, they facilitated the generation of a range of additional positive consequences at both regional and national levels. Beyond the significant achievement of having been the first region in the world to eliminate polio, the region of the Americas also succeeded in dramatically expanding access to

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49 Rogers, Diffusion of Innovations, KL7925-27.  
immunization services, raising coverage levels for all EPI diseases, establishing a strong regional laboratory network used as a model for other WHO regions, mobilizing hundreds of thousands of volunteers to participate in community health initiatives, increasing domestic ownership over and financing for immunization programs, and establishing the foundations for subsequent efforts to eliminate measles, combat cholera, and improve overall health outcomes for children throughout the region.

Mexico’s example over a 50-year time period provides strong support for Rogers’ suggestions about dynamic equilibrium. The gradual and incremental development and scale up of immunization programs in Mexico allowed the system time to adapt to changes introduced at different points in time. For example, when introducing the live oral polio vaccine in Mexico, the Salk vaccine was still used while public health officials and local communities adjusted to the new intervention. During the late 1960s and early 1970s Mexico introduced more intensive mass campaigns to accelerate polio programs, however existing routine immunization services and programs were not abandoned. As a result, even though the system could not adapt to the new mass campaign interventions, immunization services more broadly were not disrupted, in contrast to the situation in Brazil. The changes that took place during the third implementation episode in the 1980s demonstrated the adaptive capacity of the Mexican immunization program. Institutions had been established to support the more expanded campaigns, the system had been given time to adapt, and immunization progress was sustained over an extended period of time.
Learning from Latin America

In every interview with key actors involved in this history, I’ve started off with a basic question: How well do lessons from Latin America travel? Without fail, every person I’ve interviewed has rejected exceptionalist arguments that ascribe success in Latin America to a unique set of necessary conditions and prerequisites. While acknowledging the advantages that Latin America has concerning its relative homogeneity, shared histories, and the world’s oldest international health organization, every interviewee has offered a series of lessons from Latin America (both positive and negative) that have broader relevance beyond the region. Some of the most commonly offered lessons concern the ongoing tensions between “vertical” and “horizontal” approaches to health and development.

In 1992 PAHO commissioned a multi-country study done by a team of experts, to evaluate the different ways in which the EPI and polio eradication campaign had influenced domestic health systems in the region. The Taylor Commission interviewed over 500 public health officials, NGO workers, and community members, in six Latin American countries, including Brazil and Mexico. With few exceptions the Taylor Commission found that the EPI-Polio campaigns in the region were perceived as having had a range of positive spillover effects that contributed to strengthening domestic health systems. Positive responses outnumbered negative responses by 4 to 1, and “probing was required to elicit negative comments.”

Positive spillovers cited within the Taylor Commission’s study included many of the basic elements of the original Cuban polio model. The most commonly cited spillovers associated with the EPI-Polio campaign were related to community mobilization and inter-institutional collaboration, both of which were essential to the effectiveness of the Cuban model.

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Respondents noted that the basic platforms established within the EPI-Polio campaign were subsequently used by other programs such as maternal and child health programs. Additional benefits cited were related to program evaluation methods that were adapted for other programs, the increased participation of civil society in health initiatives, and the establishment of a cultural of prevention in the Americas.52

The Taylor Commission’s final report was completed in 1995, and then it all but disappeared. Shortly after the report’s release, Dr. Carl Taylor, who chaired the commission, published his own sort of rebuttal to the commission’s findings. In the article entitled, “Ethical Dilemmas,” Taylor and his coauthors cautioned that the commission’s findings and experience in the Americas had limited applicability for “less developed” countries in other regions.53 Ciro de Quadros argues, “Taylor never actually tested that, he just kept saying it…that’s not science.”54 De Quadros suggests that the experience in Latin America was dismissed as exceptional and therefore largely irrelevant to other countries and regions. De Quadros comments that PAHO and the Americas may be outliers, but only “because they did things better than other regions and organizations. That is not a justification to dismiss the results. That is justification to look more closely at what PAHO and countries in the Americas did.”55

Julio Frenk, who was one of the core members of the Taylor Commission, explains that the lessons generated by the EPI-Polio campaign helped inform subsequent approaches taken in Mexico. More specifically, that targeted campaigns had the potential to generate “positive externalities.” Frenk explains, “No one used this terminology back then, but it is to my mind, one of the earliest, if not the earliest example of what then subsequently, Jaime Sepulveda and myself

52 “Final Report of the Taylor Commission ”.
54 Author interview with Ciro de Quadros, May 18, 2012.
55 Author interview with Ciro de Quadros, May 18, 2012.
have called the ‘diagonal approach.’” The diagonal approach (discussed in chapter six) explicitly rejects dichotomies between “vertical” and “horizontal” interventions, and involves designing and using more targeted interventions to produce broader positive spillovers. Frenk explains that while De Quadros didn’t use that term in developing the polio eradication program that was what it was.

When asked why these debates about vertical and horizontal approaches have persisted in spite of such powerful evidence from Latin America, Frenk suggests two possible explanations. First, Frenk explains:

I think the ‘why’ is because not every program has been conducted with that explicit framework as clearly as Ciro de Quadros had established it at PAHO. This was not just an accident where people said ‘oh wow, look at all these additional benefits that happened.’ This was built into the design of the program. Not everyone has followed that example.56

A second explanation both Frenk and key actors like Ciro de Quadros and Mike McQuestion at the Sabin Vaccine Institute, propose is that Latin American innovations and experiences became largely invisible within the global health and development discourse.57 Frenk explains that the lessons from Latin America haven’t been well documented and examined to identify the core elements that help explain their effectiveness.58 Similarly, Ciro de Quadros suggests that in developing the global polio eradication initiative (GPEI), Latin American policy makers and experts who’d been involved in the regional campaign were more or less sidelined. Leaders within the global eradication initiative looked at the outcomes achieved in Latin America without similar attention to the processes involved and upon which the outcomes depended. De Quadros laments the fact that the GPEI “keeps reinventing the wheel.”59 A key

56 Author interview with Julio Frenk, February 6, 2013.
57 Author interview with Julio Frenk, February 6, 2013.
58 Author interview with Julio Frenk, February 6, 2013.
59 Author interview with Ciro de Quadros, February 24, 2012.
aspect of the process according to de Quadros is that PAHO facilitated information exchange, capacity building, and collective action among domestic public health officials in the region linked to the Expanded Program on Immunization and polio initiative. This notion of PAHO as a facilitator is another one of the most commonly offered lessons that can be taken from Latin America.

One of PAHO’s most obvious positive influences in domestic health policies and programs throughout history concerns the provision of basic public goods to Member Nations in the form of information and evidence about new ideas and innovations related to public health. Kurt Weyland comes to a similar conclusion in his work on social policy diffusion in the Americas and the influence of international organizations, more specifically, international financial institutions. Based his findings Weyland comments, “The World Bank is better advised to strengthen its role as a knowledge bank than to tighten its loan conditionality.”\(^6^0\) The empirical evidence presented in this dissertation, as well as interviews with public health leaders and key actors from the region, strongly supports Weyland’s suggestion.

Julio Frenk, Mexico’s Minister of Health from 2000-2006 and a vocal champion for the idea of “global public goods” explains, “We have a failure of the global health system in not building the necessary knowledge-related global public goods that would be required to facilitate effective diffusion. This to my mind would be a core function, the core function of the WHO.”\(^6^1\) Frenk notes that there are many other organizations that have strong relative advantages over the WHO in terms of providing technical assistance. While noting the importance of technical assistance, Frenk cautions that technical assistance must be driven by strong evidence. In this aspect, he argues that no other organization in the world has the potential to do what he has long-


\(^{61}\) Author interview with Julio Frenk, February 6, 2013.
since argued that the WHO should do. “The unique thing that the WHO could contribute is to build global public goods, like the evidence that would then enable policies to travel and would facilitate that travel.” Frenk explains that these global public goods are essential for effective policymaking allowing countries “not to adopt, but to ADAPT.”

It is the creation, aggregation, and circulation of global public goods and facilitating the development of adaptive capacity among Member Nations, where PAHO’s history and example has so much to offer. In the words of former PAHO Director Fred Soper, “The bridging of the gap which exists at any given time between the best available methods of combating disease in one place and the application of that knowledge for the benefit of mankind elsewhere, must ever be the responsibility of the international health agency.”

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62 Author interview with Julio Frenk, February 6, 2013.
63 Fred Soper, “First Report of Soper as Pasb Director,” (1950), 47.
REFERENCES


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Schneider, Suzanne. Mexican Community and Health and the Politics of Health Reform University of New Mexico Press, 2010.


