

Regional immunization programs as a model for strengthening cooperation among nations

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The Pan American Health Organization traces its origin back to the First General International Sanitary Convention of the American Republics, which was held in Washington, D. C., in December 1902. At the top of the agenda of the meeting were the complex public health issues involved in fighting yellow fever and other epidemic infectious diseases. The final resolution of the first convention stated, "It shall be the duty of the International Sanitary Bureau to lend its best aid and experience toward the widest possible protection of the public health of each of the said Republics, in order that disease may be eliminated and that commerce between said Republics may be facilitated." In the 19th century, efforts at inter-American cooperation had been limited almost exclusively to assisting commerce, and had had almost nothing to do with health. In 1923 the International Sanitary Bureau changed its name to the Pan American Sanitary Bureau, which would eventually become known as the Pan American Health Organization (PAHO) (1).

Pan-Americanism is the guiding principle upon which PAHO was founded. That principle is expressed in the PAHO Member States' commitment to working together to improve the health of their citizens and to support the countries facing the greatest need. This principle recognizes that many health problems require a collective effort. The PAHO Member States acknowledge that the health and public health of one's neighbors is a shared responsibility of all. Pan-Americanism is grounded in values aimed at breaking down the barriers of health inequities. This principle is perhaps even more relevant today in a world of free trade and vast movements of people.

In the 20th century, Pan-Americanism spawned several disease control initiatives that strengthened the collective efforts for improving technical cooperation among PAHO Member States, and that enhanced the strategy of "regional programs." These initiatives included yellow fever eradication and malaria eradication. The targets were not achieved with these two initiatives, mostly because the strategies were not technically feasible. Experience has subsequently demonstrated that it is virtually impossible to eradicate diseases that have mosquito vectors. However, the use of immunization and vaccine technologies enabled Member States and PAHO to establish the program to eradicate smallpox in the Western Hemisphere, a target achieved in the Region of the Americas well in advance of

other regions of the world. While the program for smallpox eradication in the Americas relied on many of the elements of Pan-Americanism, the initiative to eradicate smallpox did not realize its full potential for Regional cooperation. For example, some countries in the Americas acted independently of the policies of PAHO and the World Health Organization (WHO) and stopped vaccinating with smallpox vaccine, leaving those nations at enormous risk for importations of virus and for ensuing outbreaks.

The subsequent global achievement of smallpox eradication spearheaded the development of the Expanded Program on Immunization in PAHO and WHO. Unlike the rest of the world, EPI in the Americas was accentuated with the development of PAHO's Revolving Fund for the procurement of vaccines and syringes for Member States. PAHO's management of the Revolving Fund has helped ensure an adequate and safe supply of vaccines at affordable prices in the Americas, which in turn optimizes the likelihood that targets will not be jeopardized by insufficient supplies of vaccine. In the Americas the establishment of EPI and the Revolving Fund paved the way for the Region of the Americas to be the first region in the world to eradicate polio, as well as to achieve remarkable progress towards measles elimination. This paper will study the experience of the Regional program on immunization in the Americas in order to identify the lessons learned. It also examines PAHO's original Expanded Program on Immunization, the PAHO Revolving Fund for procurement of vaccines and syringes for national immunization programs, and polio eradication in the Americas. These lessons are intended to assist policymakers at the global, regional, and subregional levels in ensuring the highly effective coordination of health interventions among groups of countries.

THE EXPANDED PROGRAM ON IMMUNIZATION IN THE AMERICAS

In the early 1970s, countries in the Americas were confronted with the stark realities of low immunization coverage, usually between 25% and 30%; fragmented efforts to combat diseases; and isolated and poorly coordinated national immunization programs in the context of potential Regional support. The World Health Assembly established the global Expanded Programme on Immunization in 1974, and in 1977 set the worldwide goal of 80% coverage by 1990 for vaccines against six priority diseases: tuberculosis, polio, diphtheria, pertussis, tetanus, and measles. In 1977 the PAHO Directing Council (which is composed of the ministers of

health of the countries of the Americas) adopted a resolution on establishing the Expanded Program on Immunization for the Americas. In 1978 the declaration ratified at the International Conference on Primary Health Care, in Alma-Ata (2), greatly reinforced the principles underlying the EPI efforts in the Americas and other regions of the world.

In 1979 the PAHO Directing Council further strengthened the movement to accelerate the establishment of EPI efforts in all the countries of the Americas by passing a resolution that set up the PAHO Revolving Fund. The prime objective of the Revolving Fund was to serve as a PAHO coordinating mechanism on behalf of Member States in the Region for the procurement of vaccines, syringes, and cold chain equipment. As highlighted below, the Revolving Fund has become the cornerstone of immunization programs in the Region of the Americas (3).

The EPI of the Americas has developed into a Regional program supported by a technical advisory group that meets yearly to review progress, a Regional interagency coordinating group to review and galvanize funds for resource gaps, standard goals and targets for improving immunization coverage and surveillance of vaccine-preventable diseases, national plans of actions with clear objectives to execute the strategies to reach the goals, and capacity development for institutions and personnel.

As result of these efforts, vaccination coverage in the Americas increased from approximately 25% to 30% in the early 1970s to approximately 60% by the early 1980s. By 1985 the success of their immunization programs gave the countries of the Americas the confidence to embark on the goal of eradicating poliomyelitis from the Western Hemisphere by 1990.

PAHO'S REVOLVING FUND

One of the major challenges for immunization programs in developing countries is to reduce inequities in health, while ensuring that expanded services are sustainable. Program sustainability is best served when governments finance their own programs. In the Americas this is certainly the case with the purchase of vaccines. Therefore, procurement strategies for national immunization programs should be designed and developed with sustainability underpinning program development. The Member States of PAHO designed the Revolving Fund to do exactly that. The Fund provides countries with a procurement and financing mechanism that utilizes country funds for the purchase of vaccines and the basic components of their immunization programs, such as needles and syringes (4).

With the working capital always present in the Revolving Fund, PAHO will purchase supplies in advance of payment, as long as the country pays the Fund back within 60 days. At no cost to the country, PAHO negotiates affordable prices, draws up contracts with suppliers, arranges shipping, and handles other administrative procedures to ensure safe arrival to the country.

Vaccine procurement mechanisms should not be limited to vaccine purchase. Instead, these mechanisms should also serve as a tool for promoting and implementing a broad program of technical assistance that covers epidemiological, financial, and logistical sustainability. PAHO's Revolving Fund differs from the efforts in other regions of the world, where there is an increasing reliance on using resources from international donors to procure vaccines, usually through mechanisms provided by the United Nations Children's Fund.

The primary objective for establishing the PAHO Revolving Fund was to ensure better, more efficient national planning so as to avoid disruptions in vaccine supply or funds for purchasing vaccines. Other objectives included allowing purchases of vaccines in local currencies, in order to avoid delays and currency exchange losses; consolidating vaccine orders for economies of scale, meaning lower prices for the countries; assuring the quality of the vaccines; developing contracts with suppliers that would permit urgent orders to be placed and delivered on short notice; and providing a ready, continuous source of funds. Once committed for a purchase, funds become available for another purchase as soon as they are repaid. Another key Revolving Fund activity is providing essential technical cooperation for programming and for cold chain.

Before the PAHO Revolving Fund was established, PAHO and the PAHO Member States encountered enormous difficulties in trying to manage vaccine purchases. Whenever orders were needed urgently, orders were placed without regard to price, usually solely on the basis of a supplier's ability to meet the request. Vaccine manufacturers encountered substantial difficulties in planning and maintaining their production of vaccines in advance of country requests, thus making timely supply difficult. Countries faced frequent stockouts of vaccines because supply could not keep up with demand. In some cases, public confidence in immunization programs was severely undermined.

Countries that want to benefit from PAHO's Revolving Fund must generally meet certain criteria that significantly contribute to the sustainability of their national immunization programs. These criteria include allocation of a national budget item with a specific line-item for the cost of vaccines and syringes, formation of a comprehensive and real-

istic national program plan of action that covers multiple years of operations and is consistent with PAHO policy, and appointment of a national program manager with authority to develop and implement the national plan of action.

Additional mechanisms for ensuring the sustainability of vaccine production and supply are critically needed around the world. To that end, efforts of countries, such as Brazil, Cuba, and Mexico in the Americas and India and Indonesia in Asia, to develop public health laboratories for vaccine production should be encouraged and supported. These laboratories assist greatly in ensuring the availability of basic vaccines necessary for national immunization programs.

POLIO ERADICATION IN THE AMERICAS

In 1985 the Directing Council of PAHO passed a resolution calling for the interruption of indigenous transmission of wild poliovirus in the Americas by the year 1990. This resolution resulted from a groundswell of successful country experiences, which ultimately evolved into a Regional initiative and eradication program. Critical to this development was the successful implementation of national vaccination days in a few key countries, such as Brazil, Chile, Costa Rica, and Cuba, which clearly demonstrated that the strategy worked and that achieving the target was very likely.

The lessons learned from the Regional program developed to eradicate polio in the Americas were used to bolster the polio eradication initiative in other regions of the world (5). In Southeast Asia it was recognized that effective coordination of polio eradication activities requires well-functioning technical oversight and partner coordination groups to ensure that strategies are implemented as designed and that adequate resources are always available to reach the targets. Cross-border meetings played a critical role in synchronizing national vaccination days and other supplemental immunization activities.

Coordination efforts for polio eradication in the Americas were not limited to the technical or operational arenas. In El Salvador and Peru the Regional program had to work with partners in calling for cease-fire days so that children living in conflict zones could be vaccinated. Without these intensive peace efforts, it is unlikely that polio could have been eradicated in the Americas. In addition, achieving the targets challenged people to strengthen intersectoral cooperation across all levels of the health system (6). Achieving polio eradication in 1991 in Peru, the country with the last polio case in the Americas, was delayed until cease-fire days could be arranged.

FUTURE PROSPECTS FOR IMMUNIZATION IN THE AMERICAS

Twenty-five years ago, under the umbrella of the Expanded Program on Immunization, immunization programs in the countries of the Americas were challenged to rapidly accelerate and expand services. At that time, vaccines for only six diseases were included in the strategy to protect children against vaccine-preventable diseases: measles, pertussis, tetanus, diphtheria, polio, and tuberculosis. Of these six diseases, the leading killers were measles, pertussis, and tetanus. The most crippling disease was polio. The cost to protect against these diseases was less than US\$ 1.00 per child. Today, PAHO's Regional immunization program delivers vaccines against four other diseases that are major causes of morbidity and mortality among children: rubella, hepatitis B, *Haemophilus influenzae* type b, and mumps. While the cost of protecting each child has increased to approximately US\$ 24, countries remain highly committed to sustaining these advances in prevention by purchasing nearly all their vaccines with funds from their own national government budgets.

The major challenge for immunization programs in developing countries is to reduce existing inequities while ensuring that expanded services are sustainable. Program sustainability is best ensured when governments themselves cover the costs of their programs, especially the purchase of new vaccines, instead of turning to external sources of funds. While taking on new immunization activities, efforts must continue to promote better utilization of the vaccines against "old" killer diseases, such as pertussis and tetanus. Whatever the threat is, the vaccine to tackle it must be safe, effective, and affordable. Price remains a vital concern for countries, and it must be a key element to be addressed in PAHO's support to countries. Because safety is also a critical issue, the PAHO Revolving Fund only purchases vaccines that are prequalified by the World Health Organization. The Revolving Fund provides an effective procurement and financing mechanism that complements a broad spectrum of technical assistance. To that end, the Revolving Fund will remain the center piece in PAHO's efforts to support the introduction of new and underutilized vaccines and to ensure their affordability to all, including the children and families who need them the most.

The collaboration between the Regional immunization program and all the national programs in the Americas has resulted in achieving such milestones as the eradication of polio and the elimination of indigenous measles from the Western Hemisphere. However, the elimination of measles

unveiled the "tip of the iceberg" for the disease burden caused by rubella virus. Rubella maims children by causing birth defects to babies born from infected mothers. These birth defects include hearing loss, cataracts, heart abnormalities, and mental retardation. To deal with that, in 2003 the countries of the Americas joined forces to undertake a rubella and congenital rubella syndrome elimination initiative (7).

The initiative to eliminate rubella and congenital rubella syndrome will challenge national immunization programs to reach adults (8). Indeed, childhood immunization programs are rapidly evolving into family immunization programs. The lessons learned by vaccinating both men and women with vaccines containing rubella should pave the way for when vaccines against human papilloma virus and HIV become available. In addition, the rubella elimination initiative will be called on to help improve women's overall health (9, 10).

The achievements of the PAHO Regional immunization program are far from sufficient. Vaccines against "old" diseases, such as pertussis and tetanus, still need to be delivered more effectively. Pertussis continues to kill approximately 12 000 children per year in the Americas. PAHO's approach to managing its Regional immunization program, developed over the last 25 years, needs to continue efforts to address issues of inequity and to ensure sustainability. Safe, effective, affordable new vaccines, such as those for rotavirus and pneumococcus infections, must be made available to the people who need them most, including persons living in poor and difficult-to-access communities.

LESSONS LEARNED

The PAHO Regional program on immunization has built institutional structure at the national and international levels. Fundamental to this process has been that the national immunization programs are supported by Regional bodies that provide technical oversight, partnership and coordination, surveillance, networks of public health laboratories, and vaccine purchase through the PAHO Revolving Fund.

Based on the lessons learned from the years of experience coordinating immunization activities among all the countries in the Americas, other regional and global health programs should be grounded in the following characteristics:

- A core value of cooperation among countries. This was the experience of Pan-Americanism.
- The capacity to identify problems and design appropriate solutions. EPI tackled abysmally low

levels of vaccination coverage by targeting program weaknesses, while the Revolving Fund successfully addressed the chronic impediments preventing adequate supplies of vaccine.

- Sustainability of interventions. The classic example is the PAHO Revolving Fund, which requires participating countries to have a line item for the purchase of vaccines in their national government budget. Nineteen countries in the Americas have established vaccine laws as a legal framework to ensure a specific budget allocation that will guarantee the national supply and availability of vaccines.
- Political commitment. This commitment needs to be made at the highest level of the national government, and to be translated into investment of national resources for the country's immunization program.
- Sound program management. For a country to participate in the PAHO Revolving Fund, it must have a national immunization program manager, who will be responsible for executing sound strategies for the implementation and supervision of immunization interventions.
- National plans of action. The Revolving Fund also requires that countries have national plans of action in place for mapping out the strategies necessary to control vaccine-preventable diseases. These plans must have clear targets and indicators for measuring progress and for costing all the activities in order to identify program needs and gaps in resources. The Revolving Fund encourages all countries to update these plans yearly. This process requires the well-coordinated participation of the government health authorities who take the lead, as well as other national institutions and international agencies. To that end, in each country a national interagency coordinating committee, chaired by the minister of health, monitors the progress in executing the plan.
- Well-functioning technical oversight and partner coordination. The polio eradication initiative in the Americas heavily relied on the PAHO Technical Advisory Group on Vaccine-Preventable Diseases (TAG). The TAG and a network of partners meet almost every year to review progress in control of vaccine-preventable diseases and to make recommendations on or adjustments in strategies for disease control. In the case of polio eradication in the Americas, adjustments were made in the definition of a confirmed case of polio, in the indicators used to measure the quality of surveillance of acute flaccid paralysis, and in the emerging role of the network of polio laboratories throughout the Region.
- An adequate surveillance system backed by an effective network of diagnostic laboratories. The

PAHO Headquarters office in Washington, D.C., collects weekly surveillance data on vaccine-preventable diseases from all the countries in the Region of the Americas and then disseminates that compiled information via a weekly bulletin. The bulletin facilitates the effective exchange of information among countries, and it encourages countries to compete and improve their performance.

- Permanent technical cooperation support for countries in greatest need. The PAHO Headquarters assigns epidemiologists to live and work in particular countries to help those nations strengthen their immunization services. This country-based approach is critical for the success of the Regional immunization program overall as well as the individual national programs.
- Cross-border cooperation. Infectious diseases do not respect international borders. Cross-border coordination of vaccination strategies and surveillance proved essential for the eradication of polio in the Americas.
- The ability to respond to exceptional circumstances. For example, with support from the PAHO Headquarters in Washington, D.C., the negotiation of cease-fire days so that unreached children in areas of conflict could be vaccinated enabled the Government of Peru to interrupt transmission of wild poliovirus in the very end-stages of the polio eradication initiative in the Americas. Success in Peru, the last country to have polio in the Americas, ultimately allowed the entire Region to reach the target.

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SINOPSIS

Los programas de vacunación regionales como modelo para reforzar la cooperación entre países

Dos funciones esenciales de los programas de vacunación regionales aplicados en varios países simultáneamente consisten en controlar en todo un territorio, franqueando fronteras, las enfermedades que se pueden prevenir mediante la vacunación y en reducir las faltas de equidad en materia de salud. Los buenos resultados de los programas de vacunación regionales dependen del esfuerzo coordinado que hagan los países y sus socios por alcanzar una meta regional en común. Con el fin de explorar las lecciones derivadas de la experiencia, en este artículo se echa un vistazo al Programa Ampliado de Inmunización original de la Organización Pan-

americana de la Salud (OPS), al Fondo Rotatorio de la OPS para la adquisición de vacunas y jeringas para los programas nacionales de vacunación, y a la erradicación de la poliomielitis del territorio americano. Se resaltan estas lecciones para ayudar a los formuladores de políticas en los niveles mundial, regional y subregional a coordinar eficazmente las intervenciones de salud realizadas por varios países en conjunto. Para ser provechosos, los programas de salud regionales tienen que verse respaldados por un genuino compromiso con la cooperación entre países como valor fundamental; la capacidad para averiguar qué problemas existen e idear buenas soluciones; la capacidad para llevar a cabo intervenciones de manera sustentable; el firme compro-

miso de los ministros de salud y otros jefes de gobierno; la gestión eficaz de los programas; los planes de salud nacionales; la buena supervisión técnica y la coordinación de alianzas; una cooperación técnica más intensa con los países más pobres, donde hay que redoblar los esfuerzos por conseguir más recursos y apoyo; la cooperación entre países; y la capacidad para responder a circunstancias insólitas.

Palabras clave: vacunas, inmunización, prestación de atención de salud, cooperación internacional, adquisición en grupo, Organización Panamericana de la Salud, Américas.

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