By Stephen L. Cochi, Lea Hegg, Anjali Kaur, Carol Pandak, and Hamid Jafari

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ANALYSIS & COMMENTARY

The Global Polio Eradication Initiative: Progress, Lessons Learned, And Polio Legacy Transition Planning

ABSTRACT The world is closer than ever to achieving global polio eradication, with record-low polio cases in 2015 and the impending prospect of a polio-free Africa. Tens of millions of volunteers, social mobilizers, and health workers have participated in the Global Polio Eradication Initiative. The program contributes to efforts to deliver other health benefits, including health systems strengthening. As the initiative nears completion after more than twenty-five years, it becomes critical to document and transition the knowledge, lessons learned, assets, and infrastructure accumulated by the initiative to address other health goals and priorities. The primary goals of this process, known as polio legacy transition planning, are both to protect a polio-free world and to ensure that investments in polio eradication will contribute to other health goals after polio is completely eradicated. The initiative is engaged in an extensive transition process of consultations and planning at the global, regional, and country levels. A successful completion of this process will result in a well-planned and -managed conclusion of the initiative that will secure the global public good gained by ending one of the world's most devastating diseases and ensure that these investments provide public health benefits for years to come.

Stephen L. Cochi (slc1@cdc.gov) is a senior adviser to the director in the Global Immunization Division at the Centers for Disease Control and Prevention, in Atlanta, Georgia.

Lea Hegg is a program officer at the Bill & Melinda Gates Foundation, in Seattle, Washington.

Anjali Kaur is an advocacy specialist on the polio team at the United Nations Children's Fund, in New York City.

Carol Pandak is the director of PolioPlus at Rotary International, in Evanston, Illinois.

Hamid Jafari is the director of the Global Polio Eradication Initiative at the World Health Organization, in Geneva, Switzerland.

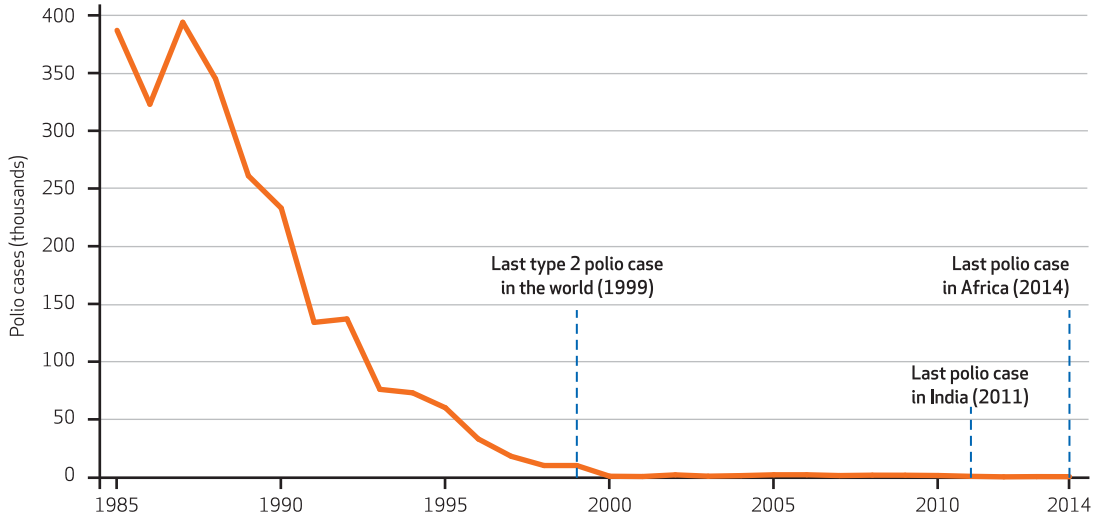
The world is closer than ever to realizing the quest to achieve global polio eradication.[1] In May 2013 the sixty-sixth World Health Assembly endorsed the Polio Eradication and Endgame Strategic Plan 2013–2018.[2] The new plan provides a timeline for the completion of the work of the Global Polio Eradication Initiative by eliminating all paralytic polio caused by either wild polioviruses that occur naturally or polioviruses that are vaccine related, which occur rarely as a result of oral polio vaccination. The four principal objectives of the strategic plan are as follows: Detect and interrupt all poliovirus transmission; strengthen immunization systems and withdraw all oral polio vaccine from use; contain poliovirus and certify interruption of transmission; and plan the polio eradication initiative's legacy.

Progress Toward Polio Eradication

Global cases of wild polio have decreased from an estimated 350,000 cases in 125 polio-endemic countries in 1988, when the initiative began, to fifty-one cases (as of October 28, 2015) in two endemic countries in 2015 (Exhibit 1). During the most recent six-month period of 2015 (May–October 2015) as of this writing, corresponding to the high season of poliovirus trans-

EXHIBIT 1

Global Wild Polio Cases By Year, 1985–2014



SOURCE Data from the World Health Organization as of October 21, 2015.

mission, a record low of twenty-five wild poliovirus type 1 cases had been reported worldwide in the two remaining polio-endemic countries, Pakistan (fifteen cases) and Afghanistan (ten cases).[1] Nigeria, formerly the third endemic country, has not reported any wild poliovirus cases in fifteen months; its last type 1 case was reported July 24, 2014. In September 2015 the World Health Organization (WHO) removed Nigeria from the list of polio-endemic countries.[3] The last wild poliovirus case in India occurred in January 2011, and the most recent wild poliovirus case in Africa was recorded in Somalia August 11, 2014 (Exhibit 1). The last wild poliovirus type 2 case in the world occurred in India in 1999.[4] The last wild poliovirus type 3 case in the world was recorded in Nigeria November 10, 2012, which suggests that wild poliovirus type 3 may now be eradicated.[5]

As the initiative nears completion after more than twenty-five years of effort, it becomes critical to document and transition the initiative's knowledge, lessons learned, assets, and infrastructure from polio eradication to other health goals and priorities.[6] The global health community has an obligation to ensure that these lessons and the knowledge generated from the initiative's experience are shared and contribute to real, sustained changes in our approach to global health. The initiative is operating under a strategic plan that now extends from 2013 to 2019 with a cumulative budget estimate of $7 billion through anticipated global certification of polio eradication from the world by 2019. An initiative workforce of more than 30,000 health workers—largely volunteer community mobilizers—is externally supported by international organizations.

It is important to understand that the initiative will cease to exist at the conclusion of this period, so it is essential to accelerate planning for the transition from a focus on polio to other goals—a process known as polio legacy transition planning. In this article we provide an update on efforts to plan for a polio-free world and build on the knowledge, lessons learned, and assets of the initiative.[6]

Polio Legacy Transition Planning

The term "polio legacy" refers to the investments made in polio eradication that can be shifted to meet other crucial health goals. The primary goals of polio legacy transition planning are both to protect a polio-free world so that it remains perpetually free of polio and to ensure that investments to eradicate polio will contribute to future health goals after the completion of polio eradication.

The initiative is engaged in an extensive transition process of consultations and planning at the global, regional, and country levels spearheaded by the Polio Legacy Management Group set up by the Polio Oversight Board (comprising leaders of the initiative's five core partners—the WHO, the United Nations Children's Fund [UNICEF], the Centers for Disease Control and Prevention [CDC], Rotary International, and the Bill & Melinda Gates Foundation) to manage the legacy process. This transition planning process

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is part of the Polio Eradication and Endgame Strategic Plan 2013–2018—specifically, objective 4, which reads as follows: "to ensure that the investments made to eradicate poliomyelitis contribute to future health goals, through a programme of work to systematically document and transition the knowledge, lessons learned and assets of the Global Polio Eradication Initiative."[2]

The planning process aims to lead to the development of detailed regional and country transition plans in the fifteen countries with the most initiative funding and infrastructure, at a minimum. The Legacy Management Group is tracking the progress of the development of transition plans, but as of October 2015 only two countries (India and Nigeria) had formally initiated or were well into such a planning process, so much work remains to be done. The initiative works with regions and countries, primarily through the respective WHO and UNICEF regional and country offices, to develop budgets and work plans in support of transition efforts. The successful completion of this process will result in a well-planned and -managed conclusion of the polio eradication initiative that not only will secure the global public good gained by ending for all time one of the world's most devastating diseases but also ensure that these investments provide public health dividends and benefits for years to come.

What Legacy Planning Involves

There are three principal aspects of the polio legacy work.[2] The first priority is maintaining and mainstreaming essential polio eradication functions, such as immunization, surveillance, communication, response, and containment, into ongoing public health programs in a polio-free world following the conclusion of the initiative. These functions will still be required after polio eradication is certified globally. Countries and partner organizations must ensure that these functions continue and are mainstreamed into ongoing public health programs. The second priority is ensuring that the knowledge generated and lessons learned during more than twenty-five years of polio eradication activities are documented and shared with other health initiatives. This includes documenting how polio infrastructure contributes to other immunization and public health priorities, which we refer to as "Legacy in Action." Each country has unique circumstances and experiences, and each would benefit from doing its own "Lessons Learned" documentation exercise. Such documentation would provide valuable insights about which polio assets and infrastructure are most appropriate for transitioning. The third priority is transitioning the capacities, processes, and assets—including human resources that the initiative has created and engaged for polio eradication—to support other health priorities, where feasible, desirable, and appropriate. This activity is important to ensure the sustainability of the program established by the initiative and to build on its success.

The initiative has developed transition guidelines and a toolkit of additional resource information including guidelines on documentation of lessons learned to assist countries in completing legacy planning, which are available on the initiative's website.[7] These guidelines recommend a twelve-to-eighteen-month process for developing and reaching consensus on national transition plans, and initiating and executing the transition plans within six months of completion of the consensus process until the new assets and infrastructure are fully operational. The top-ten priority countries for initiative transition planning, based on those currently having the most polio assets and infrastructure, are Afghanistan, Angola, Chad, Democratic Republic of the Congo, Ethiopia, India, Nigeria, Pakistan, Somalia, and South Sudan. These and a short list of additional countries with substantial polio assets (Bangladesh, Cameroon, Indonesia, Myanmar, Nepal, and Sudan) have high priority for transition planning (Exhibit 2). The initiative is working to ensure that all countries that had been polio free for at least twelve months as of mid-2015 have established transition plans by the end of 2016. In fact, most countries that have already eradicated polio are well into the legacy transition. It is also important to recognize that stakeholder engagement in polio legacy transition planning should include the World Health Assembly and the regional committee meetings of the World Health Organization's regional

EXHIBIT 2

Current Timeline For Legacy Transition Planning Of The Global Polio Eradication Initiative, 2015–19

		Timeline	
Phase[a]	**Country examples**	**Planning and decision**	**Preparation and execution**
Transition planning under way or soon to be initiated	Nepal, India, Nigeria, Sudan, Ethiopia, Somalia, South Sudan, Angola, Democratic Republic of the Congo, Bangladesh, Indonesia, Myanmar, Cameroon, and Chad	Mid-2015 to end of 2016	2017 to 2019
Current endemics	Pakistan and Afghanistan	2016 to 2017	2017 to 2019

SOURCE Data from the Polio Legacy Management Group as of October 2015. [a]Timeline contingent upon eradication status.

offices raising awareness of the need for country-level planning, 2016–17.

The experience from smallpox eradication in 1980 demonstrates that the assets from a global health initiative can disappear very quickly; fortunately, the WHO's expanded program on immunization emerged from among the lessons learned and legacy of smallpox eradication and has proven its value—and the power of vaccines—many times over during the forty years of its existence.[8–10] Consequently, the attention to extending the program capacities of the polio eradication initiative draws on global lessons from smallpox eradication and the development of the expanded program on immunization, so that lessons learned in polio eradication don't

EXHIBIT 3

Essential Lessons Learned From Global Polio Eradication Efforts

Category/subcategory
MOBILIZING POLITICAL AND SOCIAL SUPPORT
Social mobilization and advocacy
Communications and community engagement
STRATEGIC PLANNING AND POLICY DEVELOPMENT
Multiyear strategic plans and planning processes
Technical advisory bodies and policy processes (national, regional, and global)
National, state, and subnational task forces to guide and implement strategy
PARTNERSHIP MANAGEMENT AND DONOR COORDINATION
Global Polio Eradication Initiative architecture—managing a global public-private partnership
Interagency coordinating committees
Financial resource requirements and cash flow management
Resource mobilization and advocacy
PROGRAM OPERATIONS AND TACTICS
Global surveillance and response capacity, including global laboratory network
Mapping communities (microplans)
Evidence-based decision making
Accountability frameworks
Research and development
Outreach
Surveys—monitoring and evaluation
Data management
Vaccination teams—recruitment, training, monitoring, and payment
Precampaign and in-process monitoring of activities
Workforce development—building a trained and motivated health workforce
OVERSIGHT AND INDEPENDENT MONITORING
Performance indicators
Global and regional certification commissions
Independent monitoring board

SOURCE Polio Legacy Management Group.

Sustaining funding and commitment to see the initiative through to the end is a challenge.

have to be "rediscovered" and "reinvented" later at the price of much additional cost and lost momentum.

What Are The Lessons Learned?

Those involved with the initiative have learned many key lessons related to mobilizing political and social support, strategic planning and policy development, partnership management and donor coordination, program operations and tactics, and oversight and independent monitoring. Exhibit 3 presents a more detailed characterization of these categories; a full description of what we believe are the ten leading lessons learned from the polio eradication initiative has been published elsewhere.[6] We highlight here the essential lessons and knowledge we believe cannot afford to be lost as a result of poor legacy transition planning.

First, other global immunization and health priorities can benefit from the accumulated knowledge and best practices on communication and community engagement, mobilizing social and community support for vaccination, and using a targeted disease elimination initiative such as polio eradication as a springboard for broader health communication. These lessons and experiences have been generated in the world's most challenging countries, including India, Nigeria, Pakistan, and Afghanistan.

Second, polio eradication efforts have highlighted the value of an advanced, state-of-the-art global, regional, and national laboratory network for real-time disease detection and response. We have seen in many countries the knowledge and resources of networks developed and supported for polio detection and response applied to measles and other vaccine-preventable diseases. In Nigeria, the use of the polio-funded human resources, infrastructure, and experience with the polio emergency operations center was instrumental in stopping Ebola virus transmission in its tracks after only nineteen cases.[11]

Third, the knowledge and experience garnered from polio eradication efforts provide important lessons on how to reach every child, including the most underserved, migrants, nomads, people living in conflict zones, and others marginalized by circumstances that prevent or impede access to health services.

Fourth, there are examples of outstanding program monitoring and the use of accountability frameworks to assess performance in polio eradication, including in difficult settings such as Nigeria and Pakistan.

Finally, partnership coordination, advocacy, and resource mobilization were essential to achieving polio eradication goals. The initiative has assembled an unprecedented and committed global partnership led by Rotary International, the WHO, UNICEF, the CDC, and the Bill & Melinda Gates Foundation, which has collectively and relentlessly worked together to overcome the many challenges the initiative has faced and whose vanguard is the twenty million frontline vaccinators. This largest-ever global health partnership is in an ideal strategic position to move forward on other global health challenges, such as the effort to wipe the measles virus off the face of the Earth.

Applying The Lessons Of Polio Eradication

The strategies used to eradicate polio are similar to those used to tackle other infectious diseases, particularly measles and other vaccine-preventable diseases. Strategies include disease detection and use of a laboratory network for diagnostic confirmation, achieving and maintaining high levels of immunization (known as "coverage"), periodic high-quality supplementary immunization campaigns to reach children who lack access to the routine immunization system, and strong outbreak preparedness and response. In Nigeria, the experience with the use of the polio assets and infrastructure to shut down the Ebola outbreak in its early phases through aggressive surveillance, case investigation, and contact tracing is an outstanding example of leveraging existing capabilities to tackle a different infectious disease. The three other West African Ebola-affected countries provide a cautionary note of what can happen in the absence of these kinds of assets, capacity, and experience; in these three countries, the absence of infrastructure, organization, and outbreak response experience had devastating results.

The infrastructure required to eradicate polio is concentrated in many of the lowest-performing low-income countries, which are the most challenging places to achieve other health objec-

tives. Now is the time to determine how this massive infrastructure for polio eradication can be sustained and repurposed—for example, for measles eradication and immunization system strengthening.[12] Transitioning the polio assets for other priority global health activities will sustain and extend the benefits these resources have already provided, while at the same time maintaining and mainstreaming essential polio functions such as disease detection, polio immunization, communication and community engagement, and outbreak preparedness and response, which will continue to be needed in immunization programs after polio is certified as eradicated worldwide.

Challenges In Implementing Polio Legacy Transition Planning

Despite the fact that it is the most favorable time in history for achieving global polio eradication, with a record-low number of cases and geographic distribution of the poliovirus confined to parts of only two countries, there are still challenges and threats to successfully completing polio eradication. Insecurity resulting from armed conflict and civil unrest in the remaining polio-endemic areas creates uncertainty and threatens the program's ability to get the polio vaccine to children consistently. However, the situation in the tribal areas of Pakistan along the border with Afghanistan has improved enormously since the Pakistani army entered those areas in the summer of 2014, leading to a reduction in the numbers of children younger than age five who are repeatedly missed by the periodic polio mass campaigns and by the routine immunization program from more than 250,000 to the current estimate of fewer than 35,000 children.[13]

Sustaining funding and commitment to see the initiative through to the end is a challenge, even though the program is so close to the finish line. The original endgame strategic plan covered a six-year period from 2013 to 2018 with an overall $5.5 billion budget, under the assumption that the last wild poliovirus case in the world would occur in 2015.[2] With the likelihood that there will be polio cases in 2016, the strategic plan has recently been revised through 2019 with a conservative budget of $7 billion, which will require additional fundraising.

At this juncture in the initiative's evolution, it is time for polio legacy planning to proceed with all due speed, without distracting from the focus on completing the task of stopping all wild poliovirus transmission globally as soon as possible. We indicated earlier that the transition of polio assets to the combination of measles eradication and immunization system strengthening makes the most sense because the diseases have similar strategies and program implementation infrastructure needs, and the polio infrastructure is already being used to a substantial extent to support these priority activities. However, even with this close connectivity, transitioning to measles eradication and routine immunization strengthening will be a challenge. It will require a careful assessment of the roles and skills of the current international and national polio eradication human resources and "right-sizing" this workforce, agreement on the priority activities that this workforce will be responsible for implementing, and the need for additional training where appropriate. Transitioning will require a dialogue among countries and partners on multiple fronts, including the level of ownership by countries of polio assets and for what new purposes they will be used, and discussion about cofinancing, administration, oversight, and accountability frameworks.

Beginning the process of polio legacy planning early represents the initiative's desire to plan carefully and responsibly for the future.

The work of polio legacy transition planning that we have described is complex and challenging, requiring the concerted collaboration and interaction of many partners and stakeholders, together with countries, at the global, regional, and country levels. To add to the complexity, each country has unique circumstances, so there is no "one size fits all" approach.

Conclusion

Polio legacy planning aims to benefit all countries and the global community, not only those countries in which polio resources are concentrated. Beginning the process of polio legacy planning early represents the initiative's desire to plan carefully and responsibly for the future. Legacy planning will ensure that the innovations

that have helped move the world to achieve polio eradication can be adapted and applied to expanded immunization and other health programs. Under the leadership of the national governments, a broad range of stakeholders must be involved in the polio legacy planning process at the country level, including donors and civil society.

It will be important for countries to develop strong transition plans linked with national health and development priorities. Enabling long-term transitions to country ownership of basic public health functions, wherever possible, will be a priority for the polio legacy planning process. When this process is successfully completed, the world will benefit from a conclusion of the Global Polio Eradication Initiative that ends one of the world's most devastating diseases and ensures that these investments pay public health dividends for years to come. ■

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