POLIO ERADICATION

A MUST-WIN BATTLE IN THE GLOBAL WAR ON DISEASE

INTRODUCTION

The war against infectious diseases is one that has been waged throughout human history. In this centuries-long struggle the global community has made amazing progress in preventing diseases, curing illnesses, and extending life expectancies. Yet for all our achievements, only once in history—30 years ago, with smallpox—did we entirely eradicate a disease from the face of the earth.

We are now on the threshold of ridding the world of polio—a disease capable of crippling and killing many children. The polio story is both long and halting. The advent of effective vaccines in the 1950s enabled prevention of polio, and the resulting efforts were wildly successful, but challenges still remain.

In 1988, following the elimination of polio from many Western countries, the world set its sights on complete eradication of the disease by the turn of the century and formed the Global Polio Eradication Initiative (GPEI). While the initial and subsequent eradication deadlines have come and gone, polio incidence is down 99 percent from 1988, a remarkable achievement. But it falls short of the ultimate goal of forever preventing this disease from harming children.

The Bill & Melinda Gates Foundation has invested more than $1 billion (U.S.) in polio eradication through GPEI. But we are one player in a group of governments, multilateral organizations, and others—key among them Rotary International—that have invested time, energy and resources during the past 22 years. As we enter the last phases of the campaign, it is imperative to have the necessary funding, programs, and policies in place. We also need governments worldwide to ensure that we are employing the final measures needed for success.

This document summarizes the current state of play in polio, analyzes the strengths and weaknesses of the GPEI Strategic Plan, and makes it clear why the Bill & Melinda Gates Foundation believes polio eradication is more than just feasible—it is essential.

OVERVIEW OF PROGRESS IN POLIO ERADICATION

There has been enormous progress toward the eradication of polio. Since 1988, when the World Health Assembly passed a resolution pledging to eradicate polio, bilateral and multilateral bodies, as well as the governments of polio-affected countries, have worked in a cooperative, global effort to conquer the disease.

In 1994 the entire Western Hemisphere was certified as having eliminated wild poliovirus, and in 2000 the Western Pacific region, from Australia to China, was also certified polio-free.

In 1988 125 countries had circulating poliovirus, but in 2010 only four countries are considered to be polio endemic; they have never interrupted polio transmission (Afghanistan, India, Nigeria, and Pakistan). Millions of children have been spared the ravages of the disease—in 1988 there were more than 350,000 cases, compared to 2010 when fewer than 1,500 cases were reported.

These impressive results have been achieved through a combination of strategies. Some of them are basic, such as blanketing the world with polio vaccines and working at the community level to encourage local leaders in the most hard-to-reach areas to ensure that children are vaccinated. Others are complex, including the development of new and better vaccines and the use of innovative distribution and social marketing techniques to ensure every child is reached—even in conflict zones.

In the process of this worldwide initiative, an infrastructure has been built to detect suspected cases, collect specimens and ensure that they are sent to laboratories for diagnosis, and administer polio vaccines to more than 90 percent of children in most places.

The polio infrastructure has been used to deliver other health tools as well—from vitamin A to bed nets to immunizations against measles and other infectious diseases. The polio program has also trained an enormous

cadre of staff who understand basic health needs and can provide services to people in the poorest areas in the world.

Based at the World Health Organization (WHO), GPEI acts as the coordinating body for the worldwide effort to eradicate polio, developing the eradication strategy and collecting, tracking, and allocating resources for polio surveillance, containment, and eradication. It includes WHO, Rotary International, the U.S. Centers for Disease Control and Prevention (CDC), and the United Nations Children's Fund (UNICEF). GPEI coordinates a vast and diverse coalition that includes governments of countries affected by polio, private foundations, international financial institutions, donor governments, humanitarian and non-governmental organizations, and corporate partners. In addition to the CDC's technical and scientific support, other top donor countries are deeply involved in setting GPEI priorities and providing technical review and support of planned activities.

GPEI has set its sights firmly on the future, and is preparing to make the final push in the worldwide effort to eradicate polio.[1]

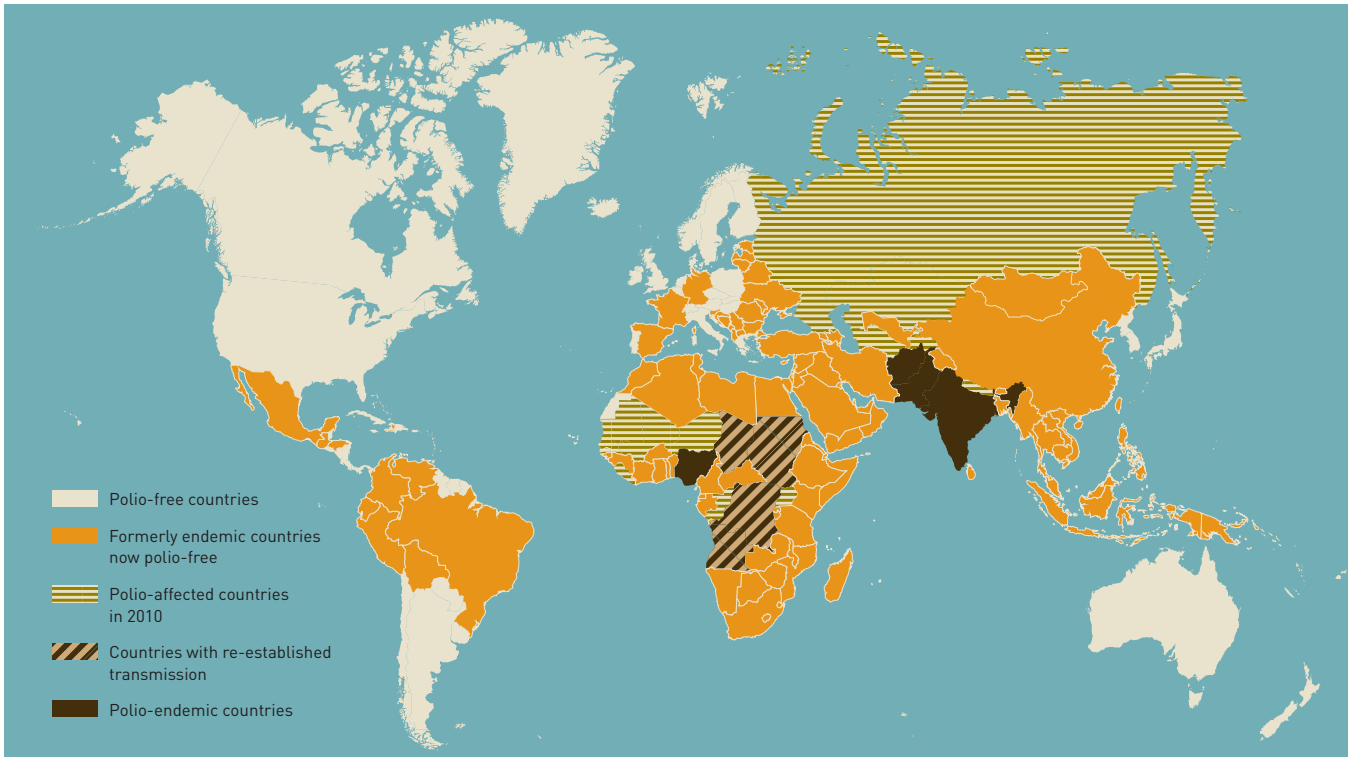
CURRENT POLIO LANDSCAPE

Despite progress since 1988, polio has remained endemic in Afghanistan, India, Nigeria, and Pakistan, and in 2010, cases were reported in a total of 20 countries. Globally, polio transmission persists in fewer than 170 districts, down from 415 at the end of 2009. However, indigenous poliovirus from endemic countries has re-infected polio-free parts of other countries.

India has exported the virus to a number of countries, including Tajikistan, Nepal, and Angola. Pakistan and Afghanistan re-infect one another.[2] Exportation within Africa has been broader. Outbreaks have hit the band of countries across West Africa, Central Africa, and the Horn of Africa. Nigeria, an endemic country, was the source of most of these outbreaks.[3] Southern Sudan, Angola, Chad, and the Democratic Republic of the Congo have had outbreaks persisting for more than 12 months, giving them the designation of "re-established" transmission.[4]

Eradication progress

In 1988 125 countries were polio-endemic; today there are four.



Source: WHO, as of December 2010

Many re-infected countries, particularly in sub-Saharan Africa, suffer significant and frequent outbreaks due to challenges including low routine immunization coverage, suboptimal outbreak response, and weak health care systems. Still, due to the strength of the polio eradication system, 14 of the 15 countries re-infected with polio in 2009 stopped these outbreaks by July 2010, and all new 2010 outbreaks were stopped, or are likely to stop, within six months.

The bivalent oral polio vaccine (bOPV) was rolled out at the end of 2009 and is highly effective at simultaneously reducing polio types 1 and 3. Use of bOPV played a significant role in reducing polio cases worldwide in 2010. In India, the use of bOPV and intensified activities have helped achieve a 95-percent reduction of all polio types in 2010 compared to 2009.

Intensified political and managerial support from all levels of the Nigerian government, as well as engagement and participation of traditional leaders in polio campaigns and social mobilization, combined with a scale-up of technical support for training and independent monitoring, are other key factors in the 94-percent reduction in polio cases in Nigeria from 2009 to 2010.

Reported cases in both India and Nigeria are at historically low levels. It is feasible that transmission of all poliovirus types could be interrupted in India and Nigeria by the end of 2011 if high-quality, focused efforts are maintained.

WHY MUST WE ERADICATE?

Polio already has been reduced by more than 99 percent, and we are on the threshold of eradication. But there are a number of other important reasons to eradicate polio.

Polio eradication will ensure that no child—ever again—has to face the threat of this terrible disease. Polio can cripple or kill, often within hours of transmission. Today the disease strikes the poorest families in the world, dragging families deeper into poverty. It is estimated that GPEI's efforts would prevent approximately eight million paralytic polio cases between 1988 and 2035.[5] Polio is like a fire—it will spread rapidly if not completely extinguished.

In 2010 Tajikistan suffered a large outbreak of 458 cases from a virus exported from India, accounting for nearly half of all polio cases worldwide in 2010. The virus then spread to Russia, which had been polio-free for two decades. As long as polio circulates anywhere in the world, there will be more outbreaks like the one experienced by Tajikistan.

Polio anywhere means there is a threat of polio everywhere.

Polio eradication has, and will continue to have, economic benefits. Studies show that the cost of attempting to contain the disease to current levels would exceed the cost of eradication by billions of dollars over the next 20 years.[6]

A recent study showed that the incremental net benefit for global polio eradication compared to just routine immunization is estimated at $40 billion to $50 billion.[7] Already, the elimination of polio in the United States has yielded net economic benefits that exceed $180 billion, not counting the benefits associated with the elimination of fear and suffering.[8]

Polio eradication boosts broader immunization and child-health efforts. The effort to eradicate polio builds on routine immunization programs, which deliver basic vaccinations to children. It is in countries where routine immunization is poor that polio has the biggest chance at resurgence. Routine immunization programs decrease polio cases and are a critical pillar of the polio eradication effort—in fact 25 percent of the resources in the polio program are intended to build these efforts. Strong immunization systems help keep millions of children from contracting deadly, preventable diseases.

Health workers in Africa who are funded by the polio eradication program contribute to a vast number of other health interventions. Almost two-thirds of those in-field activities for polio in Africa provide other health services, including additional immunizations, vitamin A supplementation, deworming medication, and bed net distribution. Approximately 93 percent of surveillance trips that included polio treatment also included surveillance of other diseases, such as measles, meningitis, tetanus, and yellow fever.

Finally, achieving polio eradication would dramatically boost other global health efforts by showing that the world can come together to unite against a common enemy, the polio virus. With eradication, the skills of staff currently working on polio could be redirected to address other global health problems.

Polio eradication would not only be a triumph against the polio virus but a global health victory, the lessons of which will be applicable to many other global health problems.

POLIO ERADICATION IS FEASIBLE

Experts believe polio eradication is feasible for a number of reasons. The oral polio vaccine (OPV) is an effective tool. OPV use has led to interruption of transmission in large geographic areas. And of the three poliovirus serotypes, type 2 appears to have already been eradicated

(the last naturally acquired case was detected in India in 1999). Thus, only types 1 and 3 remain to be eradicated.

Polio eradication is biologically feasible. Humans are essential for maintaining transmission; to survive, the virus must be passed from an infectious person to a susceptible person in a continuing chain of transmission. When the infectious person comes in contact with an immune individual, that chain is broken. There is no animal reservoir of virus to reseed the population once polio transmission is interrupted.

Additionally, unlike with many other diseases, there are reliable diagnostic tools that can determine who has polio so that intensive interventions can be specifically targeted to problem areas.

The poliovirus currently persists in a few very limited geographic areas. If we can successfully implement the eradication strategy in these places, we can terminate polio forever.

The time to eradicate polio is now. The longer it takes to eradicate the virus, the greater the chance that countries will not maintain the intensity needed to reach the immunity levels required to terminate transmission. Thus, more countries would be re-infected and become endemic for polio. As a practical matter, the current level of effort is unlikely to be sustained over a prolonged time, suggesting that a containment strategy would lead to rising polio case numbers and the need for financial resources to fight outbreaks.

ACHIEVING ERADICATION

GPEI works with impacted countries to create and implement strategies to stop polio transmission and carry out surveillance activities. GPEI partners also conduct research, strategic planning, and fundraising activities. There is widespread international support for GPEI, which works with donor and affected country governments and is ultimately accountable to the World Health Assembly.

GPEI Strategic Plan 2010–2012

The Strategic Plan 2010–2012 was developed in consultation with all major GPEI stakeholders, including key polio-affected countries, and from lessons learned over the previous 20 years of the eradication effort.

Major lessons learned

Major Lessons	What's Different in 2010–2012
Immunity thresholds to stop polio differ, being higher in Asia than Africa.	• "geographic" strategy, with OPV campaign and monitory strategy tailored to local circumstances
Immunity gaps allow virus to persist in smaller areas and subgroups than thought.	• district-specific plans and capacity • special tactics for underserved populations • independent monitoring of campaigns
Routes of poliovirus spread and outbreaks are now largely predictable.	• immunization systems strengthening • new outbreak response standards • preplanned, synchronized campaigns
Optimizing the balance of mOPVs is much more difficult than anticipated.	• bivalent types 1 and 3 OPV (bOPV) • balance of bOPV, mOPV and tOPV SIAs

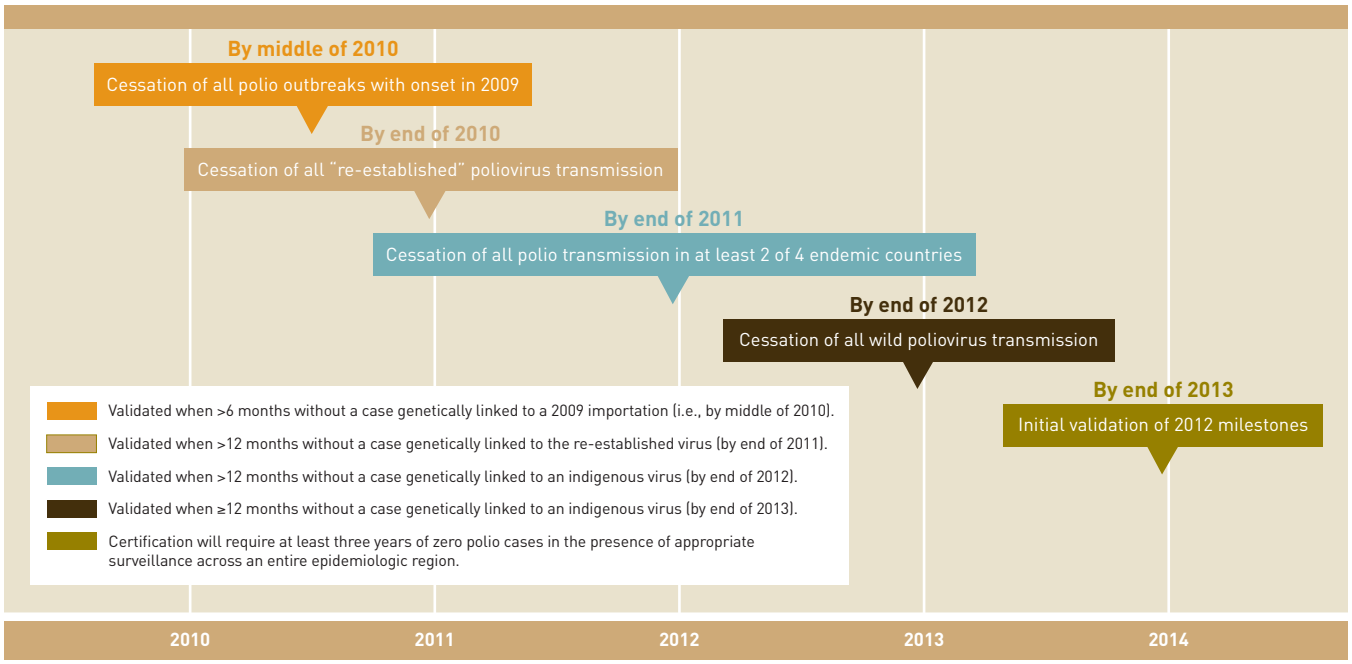
Source: Global Polio Eradication Initiative: www.polioeradication.org/Portals/0/Document/StrategicPlan/StratPlan2010_2012_ENG.pdf

Lessons Learned

GPEI has identified four key lessons from previous efforts to guide current eradication activities, which are summarized in the chart above.

To address the lessons learned, GPEI uses tailored polio campaign strategies and monitoring processes, often at district- and population-specific levels, to increase program efficiency and coverage. An improved understanding of wild poliovirus spread has led GPEI to more sharply target supplementary immunization activities and strengthen immunization systems to reduce risks of outbreaks along predictable migration routes. The program has also addressed challenges associated with using single monovalent OPV (mOPV) types of vaccines, which in some settings contribute to alternating outbreaks of the remaining wild poliovirus type 1 and wild poliovirus type 3. As part of its strategy, GPEI fast-tracked the development and introduction of the bivalent OPV formulation in 2009, as well as its global scale-up in 2010.

Polio eradication targets 2010–2013



Source: Global Polio Eradication Initiative: www.polioeradication.org/Dataandmonitoring/Polioeradicationtargets.aspx

Milestones to Reach Eradication

The GPEI Strategic Plan 2010–2012 has four major objectives:

- interrupt wild poliovirus transmission in Asia
- interrupt wild poliovirus transmission in Africa
- enhance global surveillance and outbreak response
- strengthen immunization systems

Major milestones will be tracked to achieve the program's objectives, as illustrated in the chart above.

Significant progress toward these milestones has already been achieved. The first milestone, cessation of all polio outbreaks with onset in 2009, was largely met, as 14 of the 15 countries that experienced 2009 outbreaks were stopped by July 2010. In addition, all new 2010 outbreaks were stopped or are likely to stop within six months.

Progress has been more mixed on the second milestone, cessation of all "re-established" poliovirus transmission by the end of 2010. Sudan has not reported a case since 2009 and quality improvements have occurred in Chad. On the other hand, outbreaks in Angola and the Democratic Republic of the Congo expanded in 2010, indicating the need for further attention to these countries and the challenges to success they face. To address gaps causing outbreaks, GPEI is evaluating and adjusting its strategy, operational plans, and technical support levels in critical countries.

GPEI is responding to the current environment and making adjustments as needed to make progress toward the third and fourth milestones, which are cessation of all polio transmission in at least two of the four endemic countries by the end of 2011 and cessation of all wild poliovirus transmission by the end of 2012. The program, however, still can achieve the third milestone, as cases decreased more than 90 percent in both Nigeria and India in 2010 compared to 2009. Both countries need to continue achieving further progress.

Setbacks in Pakistan have put the fourth milestone at risk. On January 25, however, the federal government stepped up its fight to end polio. Pakistan's President Asif Ali Zardari launched a National Emergency Action Plan for Polio Eradication, laying out a national blueprint to eliminate polio from the country. This includes formal plans for tracking progress on polio objectively and regularly, setting up national and provincial task forces, and engaging Pakistan's leadership in polio eradication activities.

Afghanistan, which faces similar challenges to those in Pakistan, has made tremendous progress toward eliminating polio, so we know it can be done. Since December 2010, vaccinators in Afghanistan reached 25,000 children who were previously inaccessible. The number of polio cases countrywide is down to a near record low, and contained within just two provinces—Helmand and Kandahar.

Monitoring Progress

GPEI has instituted several new processes and mechanisms for monitoring milestones and developing and implementing course corrections when milestones are in danger of being missed. A global independent advisory body, the Independent Monitoring Board (IMB), also has been established to evaluate progress, monitor corrective action plans, and provide overall guidance on policy, strategy, and priorities for GPEI. The IMB is composed of nine independent experts from around the world with expertise in fields such as health systems, communications, vaccinology, and humanitarian crisis support. The group meets quarterly, and held its first meeting in December 2010.

The Bill & Melinda Gates Foundation and other donors are working with GPEI to ensure that IMB achieves a high level of transparency, publicly disseminates relevant findings and recommendations, and is structured in such a way that it is fully independent of GPEI. To support and inform IMB, CDC will conduct a quarterly in-depth assessment of progress against milestones and risks to further progress. IMB will make recommendations to GPEI, and it will be up to GPEI partners and ministries of health in affected countries to develop and implement plans in line with IMB recommendations.

In addition to IMB, regional and national technical advisory groups (TAGs) will continue to meet regularly to review progress and provide guidance. The TAGs are composed of health workers with a variety of expertise relevant to polio eradication. GPEI will also continue to convene program managers and donor representatives on a semiannual basis to review progress, evaluate strategy, and plan the way forward.

PROGRESS AND CHALLENGES TO ERADICATION

Tremendous Progress in Shutting Off the Sources

The Bill & Melinda Gates Foundation has observed progress toward the successful completion of the GPEI plan, as well as a number of potential challenges. Impressive progress toward the achievement of key milestones of the Strategic Plan 2010–2012, especially in the two most important endemic countries, India and Nigeria, suggests that key elements of the Strategic Plan are working.

Specific achievements include:

- The new bOPV is highly effective at simultaneously reducing polio types 1 and 3. Use of bOPV in 2010 played a role in the reduction in polio cases worldwide, including a greater than 90-percent reduction in polio type 3 cases.
- Intensified efforts in India, including training, expanded social mobilization activities, and political advocacy, have helped achieve a 95-percent reduction of all polio types in India, year over year. Reported cases are at historically low levels. No cases of type 1 polio were reported in the state of Uttar Pradesh in 2010, an unprecedented achievement.
- Intensified political and managerial support from all levels of the Nigerian government, combined with a scale-up of technical support for training and independent monitoring, appear to be key factors in the 94-percent reduction in polio cases in Nigeria in 2010. Reported cases in Nigeria are also at historically low levels.
- The outbreak response strategies have been implemented effectively in West Africa and in the Central Asian Republics, suggesting that timely, high-quality outbreak control strategies in the Strategic Plan are effective.

Despite impressive achievements, progress has been inadequate in several areas, primarily due to problems with implementation of key elements of the Strategic Plan:

- Polio cases increased by 35 percent in Pakistan in 2010. Poor management and security challenges have made implementation difficult.
- Afghanistan has been able to further geographically isolate polio and stop chains of transmission, but consistently imports the virus from Pakistan. With high levels of cross-border population movement, this will continue. It is unlikely that Afghanistan can become polio-free without polio also being eradicated in Pakistan.
- Among countries with re-established transmission, progress in Angola and the Democratic Republic of the Congo is inadequate, due to suboptimal strategy implementation.
- The 2010 outbreak in Tajikistan and several neighboring countries of the former Soviet Union suggests the fragility of polio-free status in countries with gaps in routine immunization coverage.

The Challenges that Remain

Although the Bill & Melinda Gates Foundation endorses the Strategic Plan, serious challenges to polio eradication remain. There is remarkable consensus in the global community around GPEI's general strategic approach, particularly after rethinking of strategic priorities. Criticisms still exist, however, including that polio

eradication activities detract from strengthening health systems; access to children in security-compromised areas is limited, allowing the virus to persist in these locations; and quality of the current immunization efforts has been inadequate to reach certain high-risk populations such as migrants.

Some of the technical issues include:

- Rapid transmission—Polio spreads quickly from person to person, particularly in the developing world where the quality of sanitation can be poor.
- Asymptomatic infections—Not every polio infection results in paralysis; roughly one in 200 infected individuals is paralyzed. As the majority of persons transmitting the virus do not show any sign of having polio, the disease can be passed on without any physical indications, making it difficult without good surveillance to ensure that all polio is detected.
- Vaccine-derived cases—Oral polio vaccine (OPV) viruses used for large immunization campaigns can, on rare occasions, mutate and take on the properties of wild poliovirus. These vaccine-derived viruses can cause paralysis and be transmitted to other susceptible persons as readily as wild viruses. These viruses are termed circulating vaccine-derived polioviruses (cVDPVs). There were about 55 of these cases in 2010. During the same period, more than 2 billion doses of OPV vaccines were used to vaccinate children. Thus, while cVDPVs are of concern, they have been rare to date. Nevertheless, given the risks, once wild poliovirus transmission is terminated, the world will need a process to stop use of OPV, so that all polio from any source will be eradicated.
- Vaccine effectiveness—OPV is not perfectly effective. In some regions it can take up to 10 doses for the majority of the population to be protected against polio. Problems with OPV effectiveness have been a particular concern in some areas of northern India. However, with enough doses, immunity levels sufficient to interrupt transmission can be achieved even in these areas.

Additional challenges include:

- Security problems in Afghanistan and Pakistan will continue to inhibit effective implementation of eradication strategies, making it difficult to achieve the immunity levels needed to interrupt transmission.
- Despite many years of effort and international support, Pakistan has been unable to reach the quality of implementation needed to stop transmission in all areas of the country. Similarly, Angola has been unable to stop re-established transmission since 2007.
- Outbreaks in Central Africa are a significant risk to Africa's polio eradication efforts. This was tragically illustrated by the outbreak in 2010 in the Republic of the Congo that claimed the lives of more than 200 people.
- Gaps in routine immunization coverage in many polio-free countries create susceptibility to polio outbreaks following importation. Although the Strategic Plan appropriately addresses this challenge in the importation belt of Africa, no plan can truly address 100 percent of the global risks that exist. The Strategic Plan includes activities to strengthen routine immunization systems, but more extensive plans and funding are needed to improve routine immunizations. To help address these concerns, staff hired by WHO to work on country immunization programs will be required to spend at least 25 percent of their time on routine immunization. There is greater programmatic focus on identifying and reaching high-risk subpopulations such as migrants.
- Funding gaps and delays continue to hinder rapid and complete implementation of all activities in the Strategic Plan. Every time corners are cut in the program due to funding, there is a risk of re-infection.

COST OF THE STRATEGIC PLAN (2010–2012)

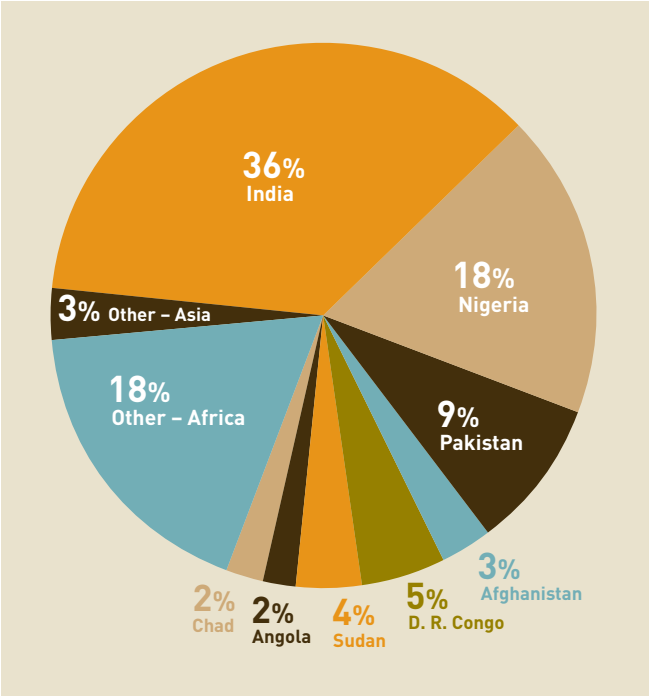
Budget for 2010–2012

GPEI updates quarterly Financial Resource Requirements documents, explaining the full budget, as well as the current financing gap. As of January 2011, GPEI requires a budget of $2.8 billion for the 2010–2012 period. This is approximately 15 percent higher than the expenditures from the previous three-year period, 2007–2009, which totaled $2.4 billion. The increased budget reflects the greater intensity of the 2010–2012 Strategic Plan, which is more ambitious than in years past and has a higher likelihood of success.

Expenses associated with conducting supplementary immunization activities (SIAs), including the purchase of vaccines and operations, are the major costs of the program, accounting for approximately 66 percent of overall GPEI costs. In total for 2010–2012, GPEI has planned more than 350 SIAs in 37 countries across Africa and Asia, a significant increase over previous years. In addition to an intensified SIA schedule, the Strategic Plan calls for other investments, such as retraining staff, increasing technical assistance, and expanding environmental surveillance, which will help improve program performance.

The chart below shows the approximate allocation of SIA and surveillance costs, by country, for the next three years. Although the endemic countries still comprise a large share of overall costs (67 percent), a significant portion of the budget (31 percent) is devoted to non-endemic countries in Africa that have ongoing poliovirus transmission or are at the highest risk of re-importations and outbreaks.

Allocation of SIA and surveillance costs by country



Source: Global Polio Eradication Initiative: www.polioeradication.org/Dataandmonitoring/Polioeradicationtargets.aspx

GPEI Budget: Post-2012

At this stage, it is very difficult to predict the level of GPEI funding needs post-2012. If all milestones are met and transmission is stopped by the end of 2012, there still will be a need to keep population immunity up, to ensure that polioviruses do not re-emerge, and to decrease the occurrence of cVDPVs. However, SIAs will likely reduce in number and scope, and the focus of the program will shift to routine immunization, surveillance, and outbreak response.

Assuming that polio technical assistance and surveillance are maintained, that two SIAs per year are conducted in the areas of highest risk, and that outbreak response is sufficient, GPEI estimates a budget of $1.99 billion for 2013-2015. The Bill & Melinda Gates Foundation has not endorsed a precise funding estimate.

Lack of funding and other unforeseen obstacles could prevent GPEI from succeeding. If transmission persisted, but in fewer geographic areas, SIAs would need to continue in these areas, and the GPEI budget would reflect this. If transmission continued at levels similar to today, this likely would lead to a global discussion on the future of polio eradication efforts, and of GPEI.

Eradication efforts are closely correlated with reduced numbers of polio infections in the short term. Even if eradication is not reached by the end of 2012, with full funding and political will there should be major progress, increasing the likelihood that eradication will be reached.

Potential Cost Savings

Overall, GPEI is viewed as having a well-managed budget with extensive review processes in place. For example, GPEI's Strategic Plan and Financial Resources Requirements reporting are subject to input and review from major donors, impacted countries, and independent review boards. That said, given the substantial funding requirements of the Strategic Plan and the large current funding shortfall, GPEI is seeking to achieve further cost efficiencies. The Bill & Melinda Gates Foundation is working with GPEI partners to ensure that resources are being used as efficiently as possible, including in the following budget areas:

OPV (33 percent of budget)—GPEI, through UNICEF's Supply Division, procures more than 2 billion doses of OPV each year, which includes monovalent, bivalent, and trivalent vaccines. The current weighted average price of OPV (across all the formulations) is approximately

$0.128 per dose for 2011 and 2012, an 11-percent reduction compared to the 2010 weighted average price per dose. GPEI worked closely with manufacturers to reduce the price of OPV for 2011 and 2012, explaining the funding situation it faces and looking for ways to meet manufacturers' needs in terms of predictability and security. As a result of this price reduction, GPEI expects a savings of $60 million against the GPEI budget.

SIA operations costs (33 percent of budget)—Operations costs for SIAs are extraordinarily complex, as a typical SIA budget includes line items for vaccinators, supervisors, recorders, security, cold boxes, fuel, markers, T-shirts, vehicle maintenance, tally sheets, and a range of other items. Each SIA budget is prepared in-country at the district and state levels. Each SIA budget is then reviewed at the national, regional, and international levels before funds are released to support the SIA. This is not a cursory review, as typically the regional or international offices will push back on several line items and ask that the budget be revised before funds are released. In addition, all operations costs are reviewed through an annual audit process at both WHO and UNICEF.

Each of the line items within an SIA budget, as well as overall SIA operations costs, varies significantly from country to country. As of 2010, SIA operations costs per child in India were approximately $0.11, while in Chad they were $0.63. This does not necessarily mean that the program is inefficient in Chad, as operations costs vary based on the security situation in each country, supply of labor for various roles, and health system infrastructure. GPEI is closely examining each SIA budget to identify ways to reduce costs, including taking lessons from lower-cost countries and applying them to higher-cost countries. In 2010, GPEI significantly reduced SIA operations costs in Chad and the Democratic Republic of the Congo—two of the highest-cost countries in the world. Chad's operational costs for 2011 are now estimated at $0.47, down from $0.63 in 2010.

Core costs (34 percent of budget)—Core costs are primarily composed of surveillance and lab costs as well as technical assistance (i.e., staffing). More than 3,000 staff are funded for polio eradication, at an annual cost of approximately $133 million. These staff are critical to ensuring the effective implementation of the program as well as subnational oversight of resources. A major focus of the new Strategic Plan is to improve SIA quality (that is, increasing the number of children reached during each SIA), and the staff in place at the international, regional, national, and subnational levels will perhaps play the most critical role in ensuring enhanced SIA quality. GPEI is looking at ways to more efficiently utilize staff, including:

- examining staffing levels across countries to ensure that they are aligned with risk levels
- ensuring that each staff member is on the most efficient and appropriate contract type
- increasing reliance on shorter-term technical support that can easily be scaled up or down depending on program needs and available funding

FINANCING POLIO ERADICATION

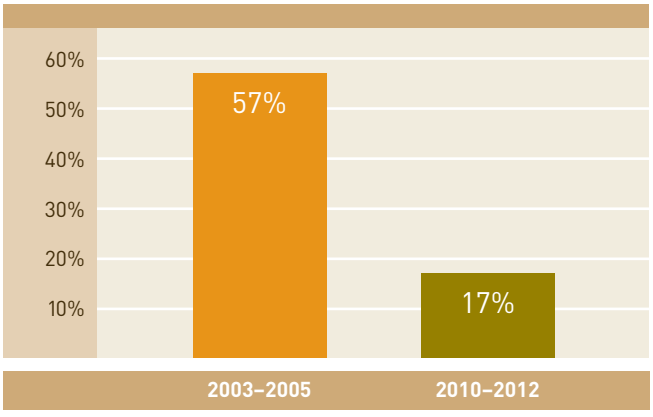
As of January 2011, against a 2010–2012 budget of approximately $2.8 billion, a funding gap of $720 million remained. Commitments made in early 2011, including approximately $60 million from the UK and $17 million from the Crown Prince of Abu Dhabi, had not yet been reflected in the official total.

Since 2005, there have been five major trends in contributions to GPEI:

- There has been a decrease in the number of donors to GPEI, from 50 in 2003–2005 to 20 in 2010–2012.
- There has been a reduction in contributions from G8 countries, both in absolute terms and in terms of percentage of overall GPEI funding needs. Peak G8 funding occurred from 2003 to 2005 and was accompanied by commitments in G8 communiqués to maintain funding at these levels going forward.

G8 contributions to GPEI

As a percentage of total GPEI budget



Source: Global Polio Eradication Initiative. www.polioeradication.org/Portals/0/Document/Data&Monitoring/HistoricalContribution.pdf

- There has been a rise in domestic resources, highlighted by India, which has increased its contributions from less than $20 million per year in 2003–2005 to more than $150 million per year since 2007. In recent years, Nigeria

and Pakistan have also provided funds for polio at a level of approximately $15 million to $25 million per year.

- The Bill & Melinda Gates Foundation has entered the picture as a major donor to polio eradication, providing approximately $450 million to GPEI from 2010 to 2012.

The funding picture for Asia is promising:

- **India**—Domestic financing has left almost no funding gap in India for 2010–2013.
- **Afghanistan**—Several donors, including Canada, the Crown Prince of Abu Dhabi, and the UK, are supporting polio efforts in Afghanistan, and funding needs through 2013 should be adequately addressed.
- **Pakistan**—Funds from a World Bank loan (convertible to a grant) will cover vaccine needs through mid-2011, and the World Bank is already in discussions with the Ministry of Finance on another loan to cover vaccine needs through 2012. Additional funding gaps remain for operations.

In Africa, funding is critically needed:

- **Nigeria**—Nigeria has funds for vaccine in place from a World Bank loan to cover vaccine needs through 2012. Domestic resources as well as funds from the Bill & Melinda Gates Foundation, Rotary International, and the U.K. will cover some of the remaining funds needed, but even with these funds a sizeable gap still exists for 2010–2012.
- **Africa**—In the new Strategic Plan, GPEI has put in place an aggressive campaign schedule across Africa that limits risk and greatly enhances the probability of stopping transmission. At the same time, although the Bill & Melinda Gates Foundation provides funds to support these campaigns both directly and through Rotary International, the large funding gap that remains for these campaigns must be closed, and the campaigns are most at risk of being canceled or delayed if funds are not secured.

CONSEQUENCES OF INADEQUATE FUNDING

Full funding is needed for all elements of the GPEI Strategic Plan. Funding delays and gaps result in increased program costs, as poliovirus continues to spread without regard to funding. If sufficient funds are not available to GPEI as outlined in the Financial Resource Requirements, activities will need to be cut back, which increases the risk of outbreaks and the potential spread of the virus to any country with an international airport. Specifically:

- Reducing outbreak control activities will lead polio outbreaks to expand rapidly. Necessary items include SIAs, political and social mobilization and communications activities, training, monitoring/evaluation, and the national and international staff to support these activities.
- Reductions in size and frequency—or elimination—of SIAs in polio-free countries, can increase the likelihood of polio transmission following importations.
- Limiting surveillance activities leads to reduced training and quality control activities, shortages of supplies, reductions in key surveillance and laboratory staff, and, ultimately, delayed case detection and reporting.
- Inadequate staffing for social mobilization and communications, or for independent monitoring, results in lower-quality SIA implementation, often necessitating extra rounds to stop transmission.

Donors have increasingly been earmarking funding to GPEI for specific activities (e.g., vaccine purchase) and to specific geographies (e.g., Afghanistan), leading to large funding gaps for staffing and surveillance in Africa and for polio campaigns in countries that have not had polio cases in six months or more.

Inadequate funding forces the program to prioritize limited resources. This means a focus on areas already infected and those at the very highest risk. However, we have learned there is a need to keep up immunity in many countries and ensure that surveillance systems are capable of identifying outbreaks early and responding quickly, to minimize dissemination of the virus before transmission is interrupted.

If resources become limited, it is likely that moderate-risk areas would be de-emphasized, which would allow for the accumulation of susceptible victims. This could fuel a potential outbreak should the virus be reintroduced in these countries. Moreover, if the major resource shortfall continues, it is likely that the milestones outlined in the Strategic Plan would not be met, further delaying eradication efforts. Delays would translate directly into increased costs and would force GPEI to maintain costs at current levels (i.e., $800 million to $900 million per year) until milestones are reached.

Additional funds obtained now to help close the funding gap will likely decrease resource needs in the future.

CONCLUSIONS

Failing to close the current GPEI funding gap substantially increases the risk of failure in eradicating polio, raises the likelihood that case numbers will increase, and ensures that costs to contain the virus will remain high. If even a single pocket of the virus survives, it can eventually spread to re-infect any country in the world and undermine the extraordinary efforts of the eradication campaign.

We cannot afford the consequences of leaving GPEI's funding gap unfilled for the critical 2011–2012 period. To maximize the impact of the Strategic Plan, donors must contribute to filling the funding gap. Even if donors fail to close the funding gap entirely, additional funding will help narrow the gap and strengthen GPEI programs, reducing the overall risk that a pocket of virus will survive and increasing the probability that GPEI milestones will be met.

The Bill & Melinda Gates Foundation has already pledged approximately $450 million during 2010-2012, and GPEI's spearheading partners are already taking some steps to increase their efforts around polio eradication:

- At WHO, the director-general has increased engagement, elevating the priority level of polio and overseeing program operations on an almost daily basis, as well as increasing WHO's advocacy with political leaders in affected countries.
- UNICEF allocated a large percentage of its flexible resources to polio eradication in 2010, and the executive director has elevated polio as a priority within the organization.
- Rotary International continues to raise significant funds through its members and has enhanced its political outreach and global communications efforts.
- CDC has made polio the first priority in its Center for Global Health, and the CDC director is taking a more active role in program oversight and deploying more staff and resources to support operations in polio-affected countries.

The work of the partners must be met with increased funding from donors, including the United States as the home of partner CDC, as well as other G8 nations, which have reduced contributions dramatically over the last five years. The United States funded approximately 25 percent of the GPEI need from 2002–2005, but since then has not adjusted its contributions for inflation despite increasing costs faced by GPEI (e.g., a 100-percent increase in the price of OPV since 2002). The United States will set a dangerous precedent for other nations if it does not increase its contribution. With the exception of the United Kingdom, which has committed to financing polio even in the face of dramatic budget cuts, other G8 countries have dropped their contributions substantially.

Working through the GPEI Strategic Plan 2010–2012, the world is poised to eradicate a disease that plagues children for their lifetimes. A win on polio will set the stage for improvements in routine immunization and the introduction of new lifesaving vaccines. It would increase confidence that large global health efforts targeting the most vulnerable populations can be successful. Failure to act now, by fully funding the effort, carries an enormous risk of polio resurgence, leading to high costs and high case numbers. As the GPEI Strategic Plan continues to show progress, governments and non-governmental organizations must commit to providing the resources and the will to finish the job.

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