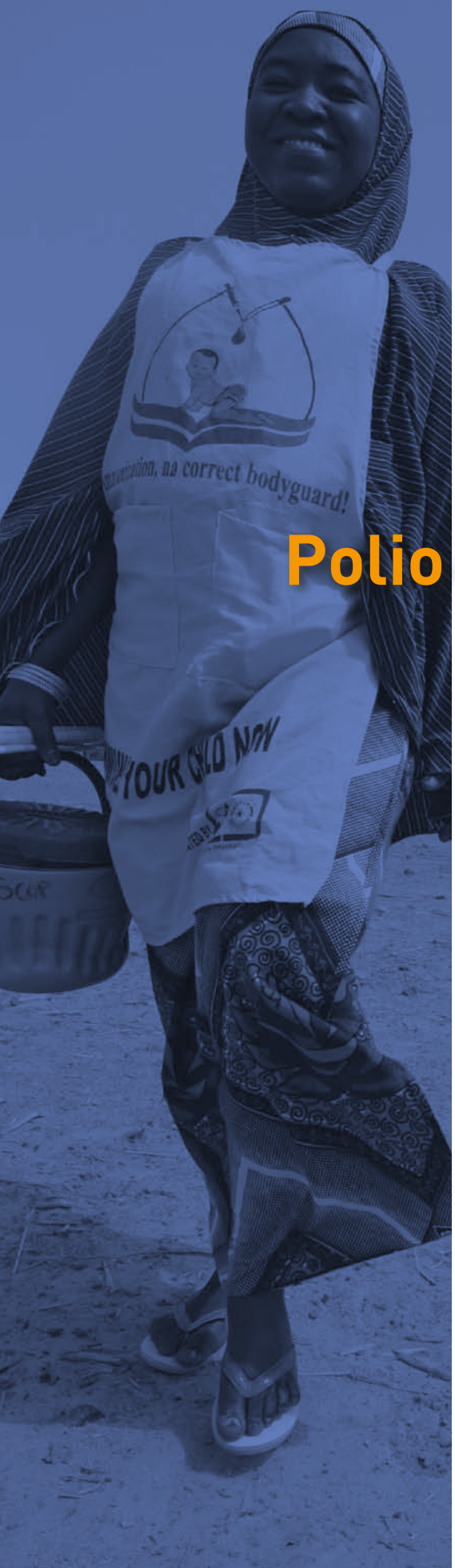
POLIO GLOBAL ERADICATION INITIATIVE



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Polio Eradication & Endgame Strategic Plan 2013-2018

World Health Organization

ROTARY INTERNATIONAL

CDC

unicef

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POLIO ERADICATION & ENDGAME STRATEGIC PLAN 2013-2018

Global Polio Eradication Initiative

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Acronyms and abbreviations

AEFI	Adverse event following immunization
AFP	Acute flaccid paralysis
aVDPV	Ambiguous vaccine-derived poliovirus
BMGF	Bill and Melinda Gates Foundation
bOPV	Bivalent oral polio vaccine
CDC	US Centers for Disease Control and Prevention
cVDPV	Circulating vaccine-derived poliovirus
DTP3	Diphtheria–tetanus–pertussis vaccine third dose
EMG	Eradication Management Group
EPI	Expanded Programme on Immunization
FATA	Federally Administered Tribal Areas (Pakistan)
FOMWAN	Federation of Muslim Women's Associations in Nigeria
FRR	Financial Resource Requirement
FWG	Finance Working Group
GAP	Global Action Plan
GAPIII	Third edition of the Global Action Plan to minimize post-eradication poliovirus facility-associated risk
GAVI	GAVI Alliance
GCC	Global Commission for Certification of the Eradication of Poliomyelitis
GIS	Geographic information system
GPEI	Global Polio Eradication Initiative
GPS	Global positioning device
GVAP	Global Vaccine Action Plan
ICC	Interagency Coordinating Committee
IFFIm	Innovative Financing Facility for Immunization
IMB	Independent Monitoring Board
IMG	Immunization Systems Management Group
IPV	Inactivated polio vaccine
IVD	Immunization and Vaccine Development
iVDPV	Immunodeficiency-associated vaccine-derived poliovirus
LGA	Local Government Area
LQAS	Lot Quality Assurance Sampling
mOPV	Monovalent oral polio vaccine
NCC	National Certification Committee
NGO	Non-governmental organization
NID	National Immunization Day
NSTOP	Nigeria Stop Transmission Of Polio programme
OPV	Oral polio vaccine
OPV2	Oral polio vaccine type 2
PAG	Polio Advocacy Group
POB	Polio Oversight Board
PPG	Polio Partners Group
PRC	Polio Research Committee
PSC	Polio Steering Committee

RCC	Regional Certification Commission
RED	Reaching Every District
SAGE	Strategic Advisory Group of Experts on Immunization
SIA	Supplementary immunization activity
SIAD	Short Interval Additional Dose
SNID	Subnational Immunization Day
STOP	Stop Transmission Of Polio programme
TAG	Technical Advisory Group
tOPV	Trivalent oral polio vaccine
UNICEF	United Nations Children's Fund
VAPP	Vaccine-associated paralytic poliomyelitis
VDPV	Vaccine-derived poliovirus
VfM	Value for money
VPD	Vaccine-preventable disease
WHA	World Health Assembly
WHO	World Health Organization
WPV	Wild poliovirus
WPV1	Wild poliovirus type 1
WPV2	Wild poliovirus type 2
WPV3	Wild poliovirus type 3

Executive summary

1. Since its launch at the World Health Assembly (WHA) in 1988, the Global Polio Eradication Initiative (GPEI) has reduced the global incidence of polio by more than 99% and the number of countries with endemic polio from 125 to 3. More than 10 million people are walking today who otherwise would have been paralysed.

2. At the beginning of 2013, polio – a highly infectious viral disease that causes swift and irreversible paralysis – was a distant memory in most of the world. The year 2012 ended with the fewest polio cases in the fewest countries ever; now is the best opportunity to finally put an end to this terrible, yet preventable, disease.

3. On 26 May 2012, the World Health Assembly declared ending polio a "programmatic emergency for global public health". Noting India's success using available tools and technology, the threat to the global community of ongoing poliovirus transmission in the last three endemic countries – Afghanistan, Nigeria and Pakistan – and the growing knowledge about and risk of circulating vaccine-derived polioviruses (cVDPVs), which can cause outbreaks of paralytic disease, the World Health Assembly called on the World Health Organization Director-General to develop and finalize a comprehensive polio endgame strategy.

4. The *Polio Eradication & Endgame Strategic Plan 2013-2018* (the Plan) was developed to capitalize on this new opportunity to end all polio disease. It accounts for the parallel pursuit of wild poliovirus eradication and cVDPV elimination, while planning for the backbone of the polio effort to be used for delivering other health services to the world's most vulnerable children.

Advances against polio in 2012

5. The year 2012 saw tremendous advances for the programme, setting up the possibility to end polio for good. Among the most significant advances is India which, in February 2012, celebrated a full year without a child paralysed by indigenous wild poliovirus (WPV). India was arguably the most technically challenging place to eliminate polio. The country's success was due to the ability of the programme to repeatedly reach all children; the use of a new bivalent oral polio vaccine (bOPV); sustained political commitment and accountability; societal support; and the availability of resources needed to complete the job. The country remains polio-free today.

6. By the end of 2012, the total number of polio cases worldwide plunged 66% over the previous year to 223. Three of the four countries that had re-established WPV transmission following importations (Angola, the Democratic Republic of the Congo and Sudan) did not have a single case in 2012. The fourth, Chad, has not reported a case since June 2012.

7. To tackle cVDPVs, new, more affordable inactivated polio vaccine (IPV) options have been developed. In an important step, the Strategic Advisory Group of Experts (SAGE), the world's chief policy guidance body for immunization, in 2012 recommended the withdrawal of the type 2 component of oral polio vaccine (OPV) as soon as possible from routine

immunization programmes[1] in all countries, facilitated by the introduction of at least one dose of IPV.

8. In September 2012, government leaders in the endemic and donor countries and the Secretary-General of the United Nations declared that ending polio is a top priority. This signalled the political commitment needed to effectively implement national Emergency Action Plans and capitalize on the progress to date.

9. In addition to declining cases in Afghanistan and Pakistan, evidence demonstrates that these countries and Nigeria showed marked improvement in increasing vaccination coverage in 2012, putting them on a trajectory to interrupt transmission by the end of 2014. This progress will continue if trends persist and current security challenges do not cause a prolonged or increased impact on operations. In Pakistan, the proportion of highest-risk districts achieving the estimated target threshold of 95%[2] increased from 59% in January 2012 to a peak of 74% in October 2012.

10. In Afghanistan, by the end of 2012, approximately 15 000 children remained unreachable, down from 80 000 in 2011, thanks to a combination of strategies, such as permanent polio teams operating in the key high-risk areas and intense outreach efforts with community leaders.

11. In Nigeria, although overall cases increased in 2012, case numbers had stabilized by the last quarter of the year due to revised microplans, better vaccination team selection, improved monitoring and strong oversight at the national and state levels. The proportion of very high-risk Local Government Areas in which vaccine coverage reached the target threshold increased from 10% in February 2012 to 70% in February 2013.

12. The tragic, targeted killings of health workers in late 2012 and early 2013 in Pakistan and Nigeria present a new threat to this progress. However, governments and partners have initiated a number of adjustments to improve safety in specific areas and to ensure the continuity of campaigns.

Planning for the end of all polio

13. The Plan was created by the GPEI in extensive consultation with national health authorities, global health initiatives, scientific experts, donors and other stakeholders. Its goal is the complete eradication and containment of all wild, vaccine-related and Sabin polioviruses, so no child ever again suffers paralytic poliomyelitis.

14. Discussions to create the Plan started with a frank assessment and acknowledgement of the reasons for missed deadlines, past failures in programme implementation, assumptions proven incorrect and lessons learnt from previous eradication plans. In the process, the following became evident:

1. **One size does not fit all**: While the core principles of eradication are global and the vast majority of polio-endemic countries stopped transmission within two to three

[1] exploiting the new IPV options as well as bOPV, informed by the eradication of wild poliovirus type 2 in 1999 and guided by new diagnostics which show that over 90% of circulating VDPVs are type 2

[2] of OPV coverage needed to stop transmission

years of starting OPV campaigns, the tactics needed in the remaining countries must be carefully tailored to adapt to a range of factors.

2. **Technological innovation cannot overcome gaps in programme management and community engagement**: Some areas – such as India and Egypt – pose exceptional challenges to stopping poliovirus transmission due to high population density, poor sanitation and a very high force of infection. The new monovalent OPV proved sufficient to quickly stop transmission in Egypt. However, the broader application of this new technology did not suffice in the other endemic reservoirs, which faced challenges in basic management and community engagement.

3. **A combination of innovations tailored to the country context can deliver success in even the most challenging conditions**: India's success highlighted the combination of best practices to ensure polio vaccination campaigns of the highest quality to stop transmission in the remaining reservoirs. These included careful microplanning and strong operations; strengthened monitoring and strict accountability measures; a massive and well-managed social mobilization effort; and a mass increase in human resources at the district and subdistrict levels.

15. On 25 January 2013, the WHO Executive Board reviewed and strongly endorsed the Plan's goal, objectives and timelines. Major elements that distinguish this Plan from previous GPEI strategic plans include:

- strategic approaches to end all polio disease (wild and vaccine-related);
- an urgent emphasis on improving immunization systems in key geographies;
- the introduction of new, affordable IPV options for managing long-term poliovirus risks and potentially accelerating WPV eradication;
- risk-mitigation strategies to address new threats, particularly insecurity in some endemic areas, and contingency plans should there be a delay in interrupting transmission in such reservoirs;
- a concrete timeline to complete the programme.

16. The Plan also outlines a legacy planning process to harness the GPEI lessons and infrastructure to deliver other critical health and development resources and, ultimately, complete the GPEI programme.

The four main objectives of the Plan

1. Poliovirus detection and interruption

The first objective is to stop all WPV transmission by the end of 2014 and any new outbreaks due to a cVDPV within 120 days of confirmation of the index case. The primary geographic focus is on the three endemic countries, the countries at highest risk of importation in Africa and countries with persistent cVDPV or a history of cVDPV emergence. Activities will focus on enhancing global poliovirus surveillance, improving OPV campaign quality to reach children in the remaining endemic and persistent cVDPV countries and ensuring rapid outbreak response. This objective also addresses the risks that have become increasingly important, particularly the insecurity and threats the programme has faced as it has rapidly pushed more systematically into chronically underserved places and populations in 2012. This global objective complements the tailored Emergency Action Plans being implemented in each endemic country.

2. Immunization systems strengthening and OPV withdrawal
This objective seeks to hasten the interruption of all poliovirus transmission and help build a stronger system for the delivery of other lifesaving vaccines.

This objective engages all 145 countries that currently use OPV in their routine immunization programmes, as well as the GAVI Alliance and immunization partners. Success in eliminating cVDPVs depends on the eventual withdrawal of all OPV, beginning with the withdrawal of the type 2 component of trivalent oral polio vaccine (tOPV). The withdrawal of this type 2 component (OPV2) entails strengthening immunization systems, introducing at least one dose of affordable IPV into the routine immunization schedule globally and then replacing the trivalent OPV with bivalent OPV in all OPV-using countries – setting the stage for eventually ending bOPV use in 2019-2020.

To achieve this objective, it is essential that immunization systems in general be strengthened. The GPEI will give particular attention to 10 countries that closely align with GAVI's focus countries, consisting of the three polio-endemic countries plus seven other countries at high risk of WPV outbreaks and recurrent cVDPV emergence: Angola, Chad, the Democratic Republic of the Congo, Ethiopia, India, Somalia and South Sudan. The GPEI will commit at least 50% of its field personnel's time to strengthen immunization systems by the end of 2014 in these countries. The goal is to annually contribute to at least a 10% improvement in coverage rates in the worst-performing districts. Building on the lessons learnt in eradicating polio, GPEI staff responsibilities will be specifically directed towards strengthening local and national capacities for the management of programmes, microplanning, the mobilization of communities and influencers, and the monitoring of programme performance.

3. Containment and certification
All 194 Member States of the World Health Organization will be engaged by work under this objective, which aims to certify all regions of the world polio-free and ensure that all poliovirus stocks are safely contained by 2018. This work includes finalizing international consensus on long-term biocontainment requirements for polioviruses. Making sure that these standards are applied is a key element of certifying eradication. Through the period of this Plan, all six WHO regions will need to have Regional Certification Commissions in place to review documentation from all countries and verify the absence of WPV in the presence of certification-standard surveillance.

4. Legacy planning
This objective aims to ensure that the world remains permanently polio-free and that the investment in polio eradication provides public health dividends for years to come. The work involves mainstreaming long-term polio functions such as IPV immunization, containment and surveillance, leveraging lessons for other major health initiatives and transitioning the polio infrastructure as appropriate. At present, polio-eradication staff comprise the single largest source of external technical assistance for immunization and surveillance in low-income countries. Polio-funded personnel are responsible for helping countries reach hundreds of millions of the world's most vulnerable children with the polio vaccine and other health interventions such as measles vaccines and anti-malarial bednets. Careful planning is essential to ensure that lessons learnt during polio eradication, as well as the assets and infrastructure built in support of the effort, are transitioned responsibly to benefit

other development goals and global health priorities. This will require thorough consultation with a range of stakeholder groups.

Implementing the Plan

17. An important aspect of the Plan's success is putting the right checks and balances in place to ensure that the milestones are met, corrective actions are implemented as needed and the programme is administered with the greatest efficiency and effectiveness possible to achieve results.

18. A Monitoring Framework will be used to assess progress against the four objectives and corresponding milestones laid out in the Plan. This framework outlines the high-level areas of work required to achieve the four objectives and the details of the activities to be implemented under each area of work, their milestones and how they will be measured. While interruption of WPV cannot be guaranteed by a particular date, recent trends in vaccinating the most difficult-to-reach children in all infected areas suggest the potential to stop the transmission of WPV by 2014 and certification of the end of WPV transmission by 2018.

19. Consisting of all WHO Member States, the World Health Assembly provides the highest level of governance of the GPEI. WHO regional committees allow for more detailed discussion by Member States and provide input to the WHO Executive Board and the World Health Assembly meeting.

20. National authorities have primary responsibility at all levels of government for the achievement of the Plan's objectives. National governments in both polio-affected and polio-free countries play a critical role in maintaining sensitive surveillance and high population immunity, including through strengthened routine immunization services.

21. The Plan also explains the role of the independent bodies that monitor the activities and advise on corrective actions as needed. These groups, listed in Table 1, inform the decision-making of the governing bodies and the Polio Oversight Board, which manages the work of the polio partnership.

Table 1: Objectives of the Plan and advisory and monitoring bodies

Objectives	Advising and monitoring
1. Poliovirus detection and interruption	Independent Monitoring Board (IMB)
2. Immunization systems strengthening and OPV withdrawal	Strategic Advisory Group of Experts (SAGE)
3. Containment and certification	Global Certification Commission (GCC)
4. Legacy planning	WHO regional committees and World Health Assembly

22. The **Polio Oversight Board (POB)** oversees the management and implementation of the GPEI through its core partner agencies. The POB is composed of the heads of GPEI core partner agencies, who meet quarterly to review GPEI operations and ensure high-level accountability across the GPEI partnership. The POB's decisions are executed through the Polio Steering Committee (PSC) and its core subsidiary bodies.

23. The **Polio Partners Group (PPG)** informs the work of the POB, represents GPEI stakeholders and donors and ensures the GPEI has the necessary political commitment and financial resources to reach the goal of polio eradication.

Overcoming the risks

24. Unexpected factors and external risks can delay or compromise the GPEI's ability to achieve the Plan's four major objectives. Recognizing risks, identifying mitigation options and articulating contingency plans enhance the GPEI's ability to rapidly react to problems, adjust its strategies as needed and minimize setbacks. Six major forward-looking input and implementation risks, listed in Table 2, have been identified.

Table 2: Input and implementation risks

Input risks	Implementation risks
Insufficient funding	Inability to operate in areas of insecurity
Inability to recruit and/or retain the right people	Decline in political and/or social will
Insufficient supply of appropriate vaccines	Lack of accountability for quality activities

25. At the time of finalizing the Plan, the greatest input risk is insufficient funding for the six-year US$ 5.5 billion budget. The most serious implementation risk is the inability to operate and reach children in areas of insecurity.

26. The insecurity in Pakistan and Nigeria has caused tragic losses and poses a new and real threat to the programme as of 2013. However, the leaders of Afghanistan, Nigeria and Pakistan remain fully committed at all levels to stop the transmission of polio in their respective countries, and efforts are under way to address the security challenges. The GPEI has developed an overarching framework for insecure areas that is being tailored to each setting. The framework is built on some primary principles: that the programme must be institutionalized within the broader health agenda and – as for all humanitarian efforts – must maintain neutrality. Basic elements of the framework include:

1. **Operational adjustments to polio campaigns**: reduce the exposure of the programme and vaccinators to potential threats by holding campaigns that are of shorter duration or lower profile;

2. **Programme safety and security**: enhance coordination between civilian and security services to inform local risk assessments, integrate these into operations plans and, where necessary, provide security to improve the physical safety of vaccinators and facilities;

3. **Community demand**: improve local community demand to increase access to vaccination and basic health services through a combination of awareness-raising activities related to the disease, its consequences and its prevention, and, where helpful, by coupling OPV with the delivery of other services/interventions;

4. **Religious leaders' advocacy**: markedly step up advocacy by international, national and local Islamic leaders to build ownership and solidarity for polio eradication across the Islamic world, including for the protection of children against polio, the sanctity of health workers and the neutrality of health services;

5. **Measures to prevent poliovirus spread**: reduce the spread risk from insecure areas through measures such as intensive vaccination in surrounding areas and the vaccination of travellers moving in and out of the infected areas.

27. This framework will be regularly assessed, and further measures will be introduced in any areas with continued transmission after the end-2014 working target date of stopping transmission.

Financing the Plan

28. The Plan's efficient and effective implementation requires as much funding as possible at its outset to ensure the certainty and predictability of financial resources. Full funding of the Plan is critical to:

- help protect the gains the GPEI has made to date;
- enable the allocation of resources to ensure the greatest impact over the long term;
- allow the GPEI to implement the Plan's major objectives concurrently, creating greater opportunity for success.

29. A thorough activity and cost analysis was conducted by the GPEI, resulting in a budget of US$ 5.5 billion to achieve the Plan's objectives through 2018.[3] While interruption cannot be guaranteed by a particular date, and various factors could intervene, this budget reflects the fact that the endemic countries are now on a trajectory to interrupt transmission by the end of 2014.

30. The budget includes the cost of reaching and vaccinating more than 250 million children multiple times every year, monitoring and surveillance in more than 70 countries, and securing the infrastructure that can benefit other health and development programmes. The costs of the programme are directly related to the number and quality of vaccination campaigns. The budget gives special attention to improving the quality of OPV campaigns needed to boost the immunity levels of children in the hardest-to-reach areas of Afghanistan, Nigeria and Pakistan.

31. A section on financial resources describes the assumptions made when calculating the Plan's costs and eventual contingencies should there be a delay in achieving the key indicators in specific geographical or programme areas. The financial requirements for the period are presented in a *Financial Resource Requirements* (*FRR*) document with corresponding costs and underlying assumptions per major budget category. The FRR information is reviewed and updated every four months.

32. A strategy is in place to obtain long-term, predictable funding for the 2013-2018 period, to ensure that a lack of funding is not a barrier to implementation and thus to eradication.

Ending polio for all time

33. Ending one of the world's most enduring diseases will create a "global public good", in that the benefits of a polio-free world will extend to all children everywhere, in perpetuity, protecting them forever from this debilitating, preventable disease. The GPEI has identified and reached more than 2.5 billion children, many of them living in some of the most

[3] This does not include the Government of India funding of its polio programme for the six-year period.

challenging areas and vulnerable communities worldwide. GPEI-funded personnel and its infrastructure have served as a vehicle for the distribution of other priority health interventions including measles vaccines, vitamin A supplements, anti-malarial bednets and anthelminthics (deworming pills). The GPEI has also served as a foundation for the surveillance of epidemic-prone diseases such as yellow fever and avian influenza in areas with fragile health systems and for humanitarian response to natural disasters and other crises. Full implementation of the Plan will both eradicate polio forever and enable the benefits to be extended, improving the immunization rates of children who never before have been reached with life-saving vaccines. Beyond ending polio, it will lay the groundwork for transitioning the lessons of the polio programme and, potentially, much of the extensive GPEI infrastructure to delivering additional public health dividends.

34. Ending polio will also produce important economic benefits. A 2010 study[4] estimated that the GPEI's efforts will generate net benefits of US$ 40-50 billion for the world's poorest countries, largely in savings from avoided treatment costs for paralytic polio and in gains in productivity. The enhanced delivery of other health interventions, broader disease surveillance capacity and improved vaccine delivery systems created by polio-eradication efforts add to the economic benefits.

35. As a result of the GPEI, polio today harms a relatively small number of children worldwide. However, this situation will change rapidly if eradication is not completed, as polio is an epidemic-prone disease. Ongoing endemic transmission in three countries will continue to threaten polio-free areas everywhere, unless it is eradicated entirely. Recent large-scale outbreaks in polio-free countries provide a graphic reminder of this threat. As recently as 2009-2011, approximately half of all polio cases were due to the international spread of polio from endemic areas to polio-free countries; approximately one third of the 2011 GPEI budget was spent on outbreak response in previously polio-free countries. Failure to eradicate polio now could result in as many as 200 000 new cases every year, within 10 years.

36. Support from the global community to fully fund the *Polio Eradication & Endgame Strategic Plan 2013-2018* will pay dividends for generations to come. Success in implementing the Plan will mean that the global partnership developed a workable, scalable model for reaching the most marginalized populations with the most basic of health interventions – a blueprint for success that could be used for future efforts to ensure that the most neglected children in the world have the opportunity to lead better, healthier lives.

[4] Duintjer Tebbens RJ et al. Economic analysis of the global polio eradication initiative. *Vaccine*, 2010, 29 (2):334-343.

1. Statement of intent

1.1 The goal of the *Polio Eradication & Endgame Strategic Plan 2013-2018* is to complete the eradication and containment of all wild, vaccine-related and Sabin polioviruses, such that no child ever again suffers paralytic poliomyelitis.

2. Background

2.1 On 26 May 2012, the World Health Assembly called for the development of a comprehensive polio endgame strategy.[5] This *Polio Eradication & Endgame Strategic Plan 2013-2018* (the Plan), developed in consultation with national health authorities, scientific experts, global health initiatives (e.g. the GAVI Alliance), donors and other stakeholders, outlines the strategic approach to the eradication of all remaining polio disease – due to both wild and vaccine-related polioviruses – the management of poliovirus risks in the post-eradication era and the development of a process for transitioning the Global Polio Eradication Initiative (GPEI) infrastructure as the initiative comes to completion. The consultations included, among others, the global Polio Partners Group (PPG), national and international technical advisory groups (TAGs) and the Independent Monitoring Board (IMB) of the GPEI. In November 2012, the Strategic Advisory Group of Experts on Immunization (SAGE) reviewed the Plan and endorsed its major components. In January 2013, the Executive Board of the World Health Organization reviewed the document and provided further guidance for its finalization.

2.2 This Plan supersedes the *GPEI Emergency Action Plan 2012-2013*[6] and incorporates elements of the emergency/national action plans of the three remaining endemic countries, which outline specific activities to complete WPV eradication in specific geographies. The Plan is based on the epidemiology of polio globally at the end of 2012, the recent rate of oral polio vaccine (OPV) campaign quality improvements in the remaining polio-infected areas, new understanding of the risks posed by vaccine-related polioviruses, and the recent development of new strategies and tools for managing post-eradication risks. In recognition of the urgency of strengthening immunization systems, particular attention has been given to aligning this Plan with the goals, objectives and major activities of the Global Vaccine Action Plan (GVAP).[7]

2.3 Beyond 2014, this Plan will be complemented by new biannual operational plans that will outline the specific activities and tactics needed to achieve the Plan's objectives, based on the evolving epidemiology of polio, the priorities for managing the vaccine-related and post-eradication risks, and the agreed priorities of the polio legacy work. To allow flexibility and modifications in approach, the Plan and its implementation will be formally reviewed on an annual basis. With full implementation of this Plan, polio will be the first disease of humans to be eradicated from the earth in the 21st century.

2.4 This document is intended for use by individuals and organizations involved in polio-eradication efforts. Potential users of the document include:

- National polio and immunization programme managers and staff;
- Partners supporting the GPEI;
- WHO and UNICEF country and regional focal points for polio-eradication and immunization efforts and UNICEF health staff;
- National Interagency Coordinating Committees (ICCs);

[5] Resolution WHA65.5, "Poliomyelitis: intensification of the global eradication initiative".
[6] The Emergency Action Plan is available at http://www.polioeradication.org/resourcelibrary/strategyandwork/emergencyactionplan.aspx.
[7] Resolution WHA65.17, "Global vaccine action plan".

- Polio-eradication oversight and management bodies;
- Polio-eradication and immunization technical advisory bodies.

3. Overview

3.1 What's new?

3.1 The *Polio Eradication & Endgame Strategic Plan 2013-2018* for the first time brings together a comprehensive approach to completing polio eradication. Five new, major elements that distinguish this Plan from the previous ones are:

- its strategic approaches to end all polio disease (wild and vaccine-related);
- an urgent emphasis on improving immunization systems in key geographies;
- the introduction of new, affordable IPV options for managing long-term poliovirus risks and potentially accelerating WPV eradication;
- risk-mitigation strategies to address new threats, particularly insecurity in some endemic areas, and contingency plans should there be a delay in interrupting transmission in such reservoirs;
- a concrete timeline to complete the GPEI.

3.2 Previous plans focused primarily on interrupting wild poliovirus (WPV) transmission, followed by the elimination of vaccine-derived polioviruses (VDPVs). This Plan incorporates innovative tactics, strategies and tools that will enable the programme not only to interrupt WPV transmission but in parallel to address the risks associated with VDPVs. This fundamental shift in approach makes the most of the recently-developed bivalent OPV (bOPV) and new inactivated polio vaccine (IPV) options at a time when immunization and surveillance performance are expected to be at their strongest – thus improving the probability of success.

3.3 In the Plan, the strengthening of immunization systems is given the same urgency and importance as improving OPV campaign quality in areas of highest programme priority. Strengthened immunization systems will serve both as a stronger base for building population immunity to interrupt WPV transmission and as a sustainable platform for the introduction of new vaccines (i.e. IPV options) to help manage long-term poliovirus risks. This Plan commits the GPEI to intensified efforts to strengthen immunization systems using polio-funded staff, assets and tools and increased collaboration with immunization partners in key geographies.

3.4 The development and introduction of new vaccines is a major development in the management of poliovirus risk. In addition to expanding the use of bOPV, this Plan exploits a new understanding of the impact of IPV on mucosal immunity and new, low-cost options for its wide-scale use. The Plan outlines how the development and licensure of affordable IPV options will be fast-tracked. This will facilitate the withdrawal of OPV from routine immunization programmes (and thereby the elimination of VDPVs) and may also help accelerate WPV eradication in key reservoirs.

3.5 Recognizing the increasing risk of delays due particularly to insecurity in some endemic reservoirs, the Plan outlines a five-pronged framework to enhance programme safety and coverage in such areas, as well as additional measures to reduce the risk of international spread.

3.6 By changing from the sequential to the parallel management of the WPV and VDPV risks, the GPEI is able to establish clear timelines and milestones for completing the GPEI.

3.2 The major objectives

There are four major objectives with corresponding areas of work in the *Polio Eradication & Endgame Strategic Plan 2013-2018*:

1. Poliovirus detection and interruption
This objective is to stop all WPV transmission by the end of 2014 by enhancing global poliovirus surveillance, effectively implementing national emergency plans to improve OPV campaign quality in the remaining endemic countries and ensuring rapid outbreak response. This area of work gives particular attention to addressing the risks that emerged as increasingly important in late 2012, mainly insecurity, as the programme began to reach chronically underserved places and populations more systematically. This objective also includes stopping any new polio outbreaks due to a circulating vaccine-derived poliovirus (cVDPV) within 120 days of confirmation of the index case. The objective's primary geographic focus is on the three endemic countries and the countries at highest risk of importation in Africa and southern Asia.

2. Immunization systems strengthening and OPV withdrawal
This objective will help hasten the interruption of all poliovirus transmission and build a stronger system for the delivery of other lifesaving vaccines. To eliminate all VDPV risks, in the long term all OPV must be removed from routine immunization programmes. As WPV type 2 (WPV2) was eradicated in 1999 and the main cause of VDPV outbreaks is currently the type 2 component of OPV, this component must be removed from the vaccine by mid-2016. Preparation for this removal entails strengthening immunization systems – especially in areas of highest risk, introducing at least one dose of IPV into routine immunization programmes globally, and *then* replacing the trivalent OPV with bivalent OPV in all OPV-using countries. This objective affects all 145 countries worldwide that currently use OPV in their routine immunization programmes.

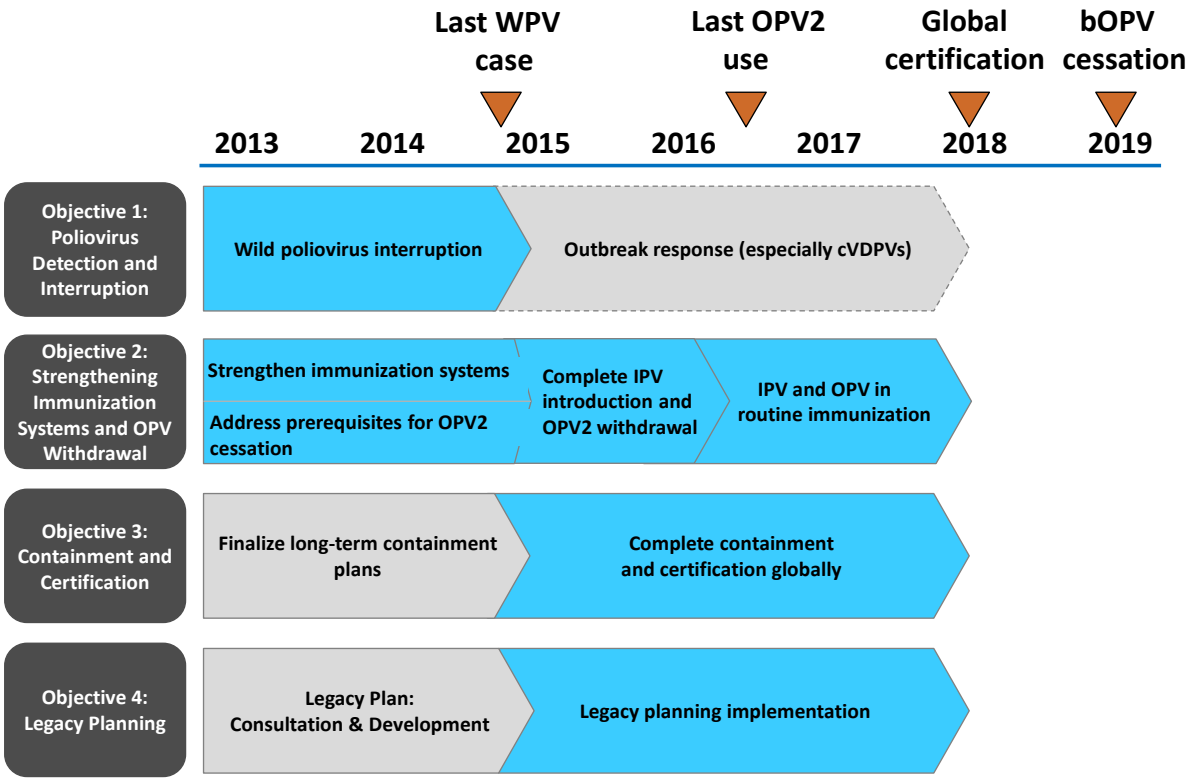
3. Containment and certification
This objective encompasses the certification of the eradication and containment of all WPVs in all WHO regions by the end of 2018, recognizing that a small number of facilities will need to retain poliovirus stocks in the post-eradication era for vaccine production, diagnostics and research. Criteria for the safe handling and biocontainment of such polioviruses, and processes to monitor their application, are essential to minimize the risk of poliovirus reintroduction in the post-eradication era. Consequently, this area of work includes finalizing international consensus on long-term biocontainment requirements for polioviruses and the timelines for their application. Verifying the application of these requirements, under the oversight of the Global Certification Commission, will be a key aspect of the processes for certifying global eradication. All 194 Member States of the World Health Organization are affected by work towards this objective.

4. Legacy planning

As the polio programme approaches key eradication milestones, successful legacy planning will include mainstreaming essential polio functions into ongoing public health programmes at the national and international levels, ensuring the transfer of lessons learnt to other relevant programmes and/or initiatives, and transitioning assets and infrastructure to benefit other development goals and global health priorities. Thorough consultation as well as planning and implementation processes are required to ensure the investments made in polio eradication provide public health dividends for years to come. Work under this objective will lead to the development of a comprehensive legacy plan by the end of 2015.

As illustrated in Figure 1, the four major objectives of the Plan are not sequential but will run in parallel. From 2013 to 2015, the main emphasis in terms of country-level implementation will be on the first and second objectives; increasing emphasis will be given to the operational aspects of the third and fourth objectives as key milestones are achieved. A high-level Monitoring Framework (Annex B) tracks progress against these working targets.

Figure 1: Polio Eradication and Endgame Strategic Plan[a]
This figure shows that with full funding, the objectives can be pursued in parallel, with working target dates established for the completion of each.



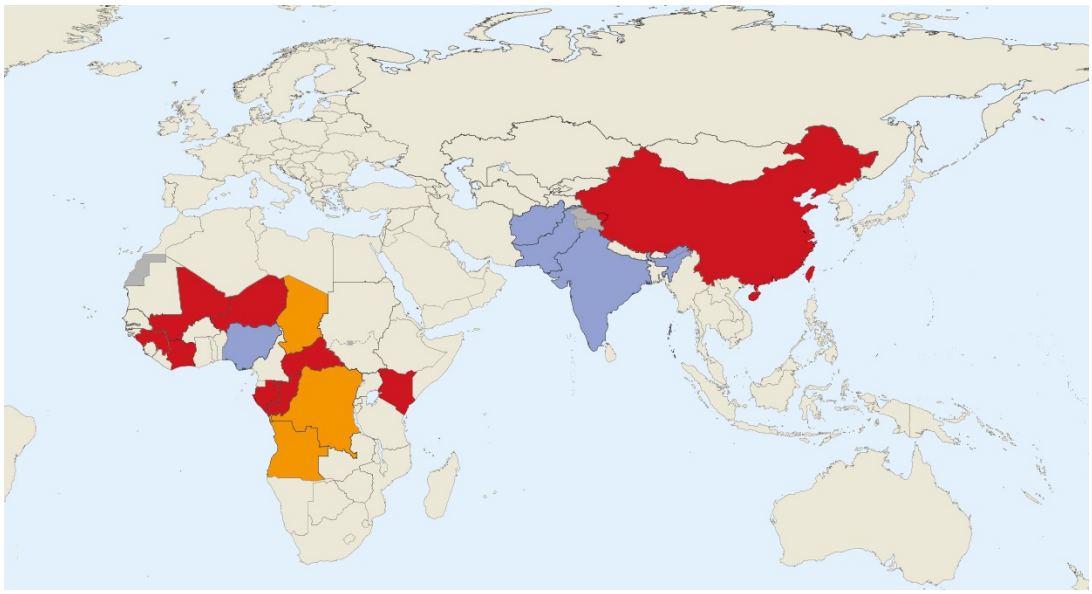
[a] Essential activities (e.g. surveillance, laboratory network and IPV in routine immunization) will be mainstreamed beyond 2019.

4. Context

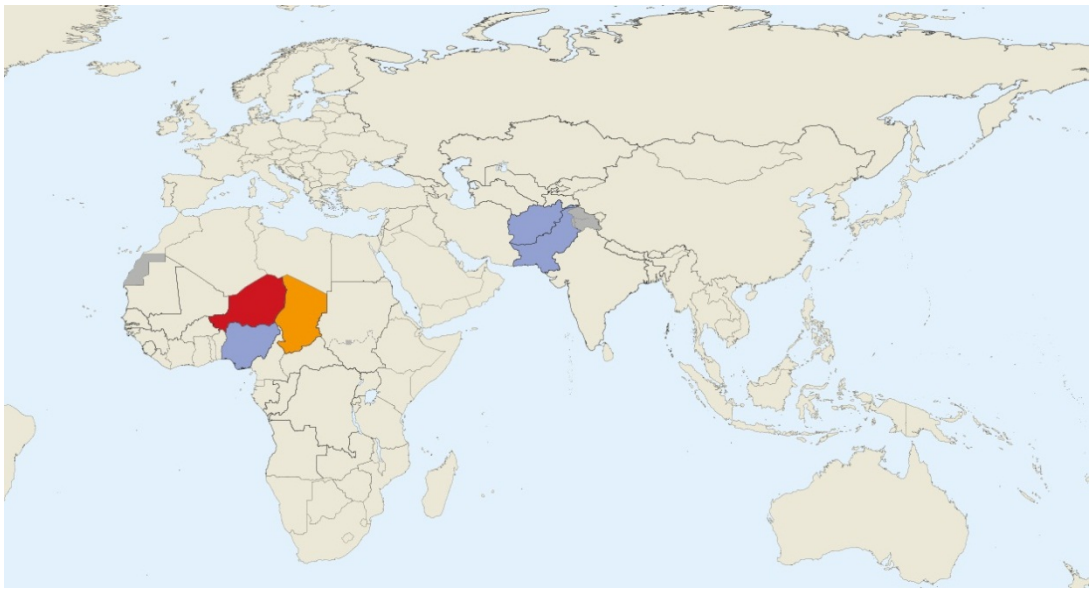
4.1 Where we are today

Figure 2: Countries with cases of wild poliovirus, 2011 and 2012

2011



2012



Countries with endemic transmission of indigenous WPV.
Countries with re-established transmission of WPV.
Countries with outbreaks following importation of WPV.

2011	2012
Last case in India	Last cases in Angola and Dem. Rep. of the Congo
3 countries with re-established transmission	1 country with re-established transmission
11 outbreaks in 9 countries	1 outbreak
16 countries, 650 cases	5 countries, 223 cases

4.1 The World Health Assembly, the annual meeting of the Ministers of Health of all WHO Member States, first committed to polio eradication when it adopted resolution 41.28 in 1988 calling for the worldwide eradication of the disease by the year 2000. That marked the launch of the GPEI, spearheaded by national governments, WHO, Rotary International, the US Centers for Disease Control and Prevention (CDC) and UNICEF.

4.2 At that time, endemic WPV transmission existed in more than 125 countries and each year more than 350 000 children were paralysed for life by polio. Since 1988, the GPEI has reduced the global incidence of polio by more than 99.9%, three of six WHO regions have been "certified" polio-free (the Region of the Americas in 1994, the Western Pacific Region in 2000 and the European Region in 2002), and one of the three WPV serotypes (type 2) has been eradicated (last isolated in 1999).

4.3 Through the GPEI, more than 10 billion doses of OPV have been administered to more than 2.5 billion children worldwide; more than 10 million people are walking today who otherwise would have been paralysed; and over 1 million childhood deaths have been prevented through the administration of vitamin A during polio campaigns.[8]

4.4 In January 2012, a fourth WHO region (the South-East Asia Region) took a major step towards polio-free certification as India passed the milestone of one year without a single case. As India moved towards this milestone, however, case numbers doubled in 2011 in the three remaining polio-endemic countries: Afghanistan, Nigeria and Pakistan. Given the increasing evidence from recent outbreaks of the terrible consequences of failing to complete polio eradication,[9] but also the potential for success as shown by India, in May 2012 the World Health Assembly declared the completion of polio eradication a "programmatic emergency for global public health" and called for a marked increase in the intensity of eradication activities in the poorest performing regions.

4.5 In all three remaining polio-endemic countries, national Emergency Action Plans were established to overcome the remaining barriers to reaching every child with polio vaccines; in each country, oversight bodies reporting to heads of state were further extended from the national to subnational levels to intensify political and administrative accountability for the quality of key eradication activities. The core GPEI partners intensified their activities to reflect this emergency and a massive surge of technical assistance was deployed to the highest risk areas for polio to assist governments with strategy implementation. In September 2012, the Secretary-General of the United Nations hosted a high-level meeting on the polio-

[8] An estimated 1.1 to 5.4 million childhood deaths were averted as of the end of 2010. Duintjer Tebbens RJ, Pallansch MA, Cochi SL et al. Economic analysis of the Global Polio Eradication Initiative. *Vaccine*, 2010, 29 (2):334-343.

[9] Notably outbreaks in adults in the Democratic Republic of the Congo in 2010-2011 caused by wild poliovirus type 1.

eradication emergency during the sixty-seventh session of the United Nations General Assembly, to reinforce national and international commitment to achieving eradication and mobilizing the necessary financing. The gathering was attended by the heads of state of the three countries where the disease is endemic, the heads of the partner agencies, donors and other stakeholders.

4.6 As a direct result of emergency actions taken by GPEI partners and national governments, 2012 witnessed the lowest number of new polio cases in fewer districts of fewer countries than at any previous time in history. Globally, 223 cases were reported in 2012, a 66% decline compared with 2011. At the end of 2012, Angola and the Democratic Republic of the Congo successfully stopped transmission of re-established poliovirus and Chad was on track to do the same (its most recent case was on 14 June 2012). Five countries reported cases in 2012 compared with 16 in 2011. In two of the endemic countries, Pakistan and Afghanistan, case numbers declined by 65% and 42% relative to 2011, respectively. In Nigeria, case numbers doubled compared with the same period in 2011, but by the end of 2012 there was strong evidence of improving programme performance in the historically worst-performing areas.

Figure 3: Polio-infected districts, 2012

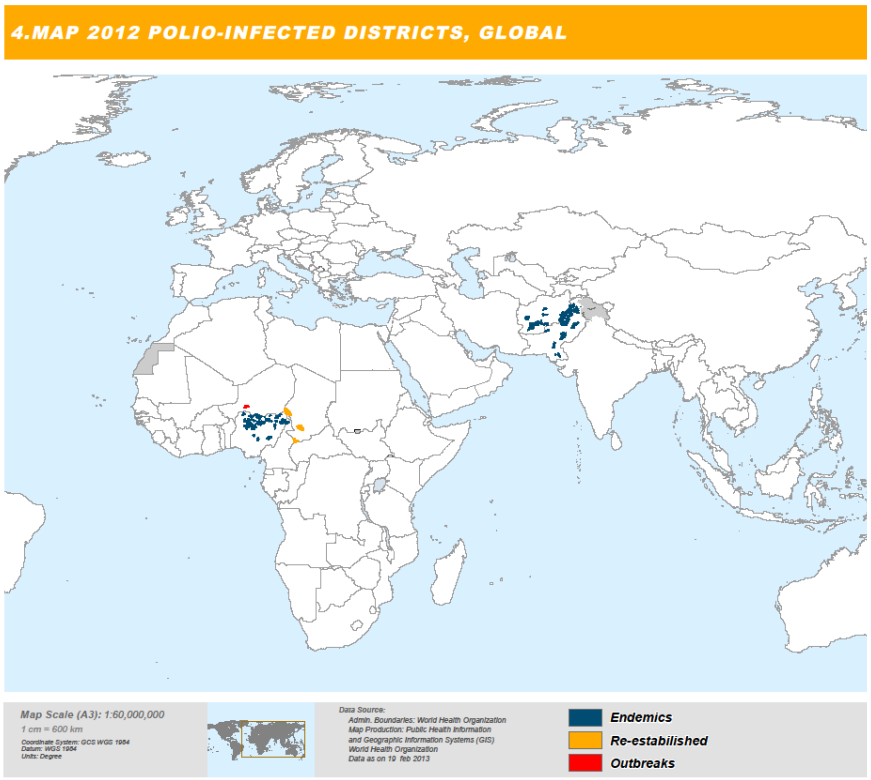


Table 3: Wild poliovirus cases by quarter, 2012

Global - by Quarter

Quarter	TOTAL
Q1	**54**
Q2	**50**
Q3	**74**
Q4	**45**
TOTAL	223

Global - by Type & by Quarter

Quarter	W1	W3	TOTAL
Q1	44	9	**54***
Q2	43	7	**50**
Q3	70	4	**74**
Q4	44	1	**45**
TOTAL	201	21	223

By Region & by Quarter

Quarter	AFRO	EMRO	TOTAL
Q1	33	21	**54**
Q2	34	16	**50**
Q3	39	35	**74**
Q4	22	23	**45**
TOTAL	128	95	223

* Includes one WPV1/WPV3 mixture

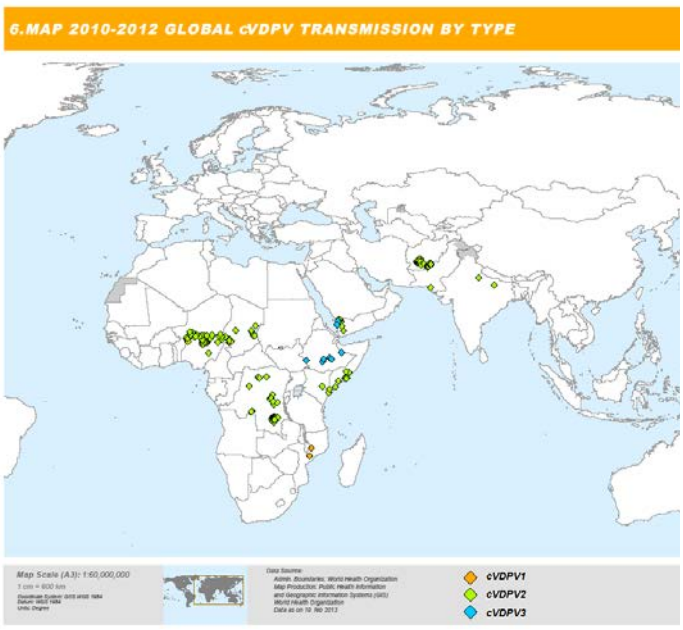
4.7 Throughout the global polio-eradication effort, viruses from endemic areas, particularly India and Nigeria, have regularly reinfected polio-free areas, leading to importation-associated outbreaks and, in four previously polio-free countries, the re-establishment of persistent transmission. Although international spread was limited to only one event in 2012 in Niger resulting from a virus genetically linked to transmission in Nigeria, importations will remain a significant and constant threat until all WPV transmission is interrupted globally.

4.8 In January 2013, the WHO Executive Board reinforced the importance of full OPV vaccination of travellers, per the recommendations of WHO publication *International travel and health.*

4.9 As the GPEI has worked to eradicate WPVs globally, it has come to better understand the risks that vaccine-related polioviruses pose to a polio-free world. Vaccine-associated paralytic poliomyelitis (VAPP) was well documented prior to the launch of the eradication effort and it was understood that VAPP could eventually be eliminated by stopping the use of OPV globally after wild virus eradication. Only in 1999-2000, however, was it proven that VDPVs could regain the capacity to cause polio outbreaks (i.e. become circulating VDPVs or cVDPVs). It is now understood that VDPVs can also, very rarely, result in chronic infection (i.e. immunodeficiency-associated vaccine-derived poliovirus) in individuals with certain congenital immunodeficiency syndromes.

4.10 In 2012, for the first time ever, more countries suffered a polio outbreak due to a cVDPV (primarily as the result of a type 2 virus) than due to a WPV, reaffirming the importance of rapidly addressing this risk (Figure 4). Fortunately, the substantial body of knowledge built since the first detection of a cVDPV in 1999-2000 has now culminated in the tools and strategies needed to eliminate VDPVs in parallel with WPV eradication during the 2013-2018 period.

Figure 4: Circulating vaccine-derived poliovirus cases by type, 2010-2012



4.2 Acknowledging the past – Lessons learnt

4.11 Since the launch of the GPEI, three major deadlines were established: interruption of transmission by 2000, certification of eradication in 2005 and, most recently, interruption of transmission by the end of 2012. Consequently, as part of this Plan's development, the GPEI embarked on a critical review of the programme to assess:

- how lessons from past successes and failures should inform future strategy;
- whether the remaining endemic countries are on a trajectory to complete eradication;
- the strength of the case for completing eradication, taking into account the new resources required through 2018.

4.12 The combination of these evaluations has provided the GPEI with a better understanding of why past deadlines were missed, how close the remaining endemic countries are to achieving their goals and how critical this global eradication effort continues to be.

Lesson 1: One size does not fit all

4.13 The GPEI missed its first target date of 2000 for interrupting WPV transmission globally. This was due in part to the late launch of OPV campaigns in key geographies, including some plagued by high case rates and intense transmission. At that time, interruption of transmission in any particular country was expected to occur within two to three years of the launch of National Immunization Days (NIDs). The launch of these campaign activities as late as 1999-2000 in countries such as the Democratic Republic of the Congo and Sierra Leone meant that a 2000 deadline was poorly planned, inadequately financed and impossible to achieve. Equipped with a better understanding of the critical importance of OPV campaigns in interrupting transmission, the GPEI doubled the number of supplementary immunization activities (SIAs) conducted in the period from 2000 to 2005. This was supported by a tenfold increase in technical support staff and the introduction of house-to-house vaccination. By 2005, six endemic countries remained – down from more than 20 in 2000. Although only six remaining endemic countries globally marked an improvement, the target of certification of eradication by 2005 had not been achieved. Moreover, the programme retained its existing approaches, merely intensifying them, thereby missing opportunities to truly innovate, refine tactics to the specific country context or improve immunization systems.

Lesson 2: Technological innovation cannot overcome gaps in programme management and community engagement

4.14. In the mid-2000s, the GPEI recognized that some areas posed exceptional challenges to stopping poliovirus transmission due to high population density, poor sanitation and a very high force of infection. This complicated the situation in India and Egypt in particular because, unlike the other infected areas at that time, where the main issue was a failure to reach children, both countries had high levels of vaccination coverage but were not achieving high enough serological conversion and mucosal immunity levels to interrupt transmission.

4.15 In 2005, monovalent OPV vaccines (mOPV1, mOPV3), which provided higher per dose seroconversion rates but tackled only one poliovirus serotype at a time, were developed and introduced as a means to address this issue. Egypt stopped transmission within six months of the introduction of mOPV1, leading many to believe that intensive use of mOPV could overcome persistent transmission in other areas. India introduced mOPV1 and mOPV3 in 2005 but – over the course of the next five years – veered between alternating type 1 and 3 outbreaks. Other endemic countries, particularly Nigeria and Pakistan, continued to have widespread transmission. This demonstrated that in the remaining endemic countries, which faced challenges of basic management and community engagement, technological solutions alone were not sufficient. By 2010, although only four countries still remained endemic, many more had suffered major importation-associated outbreaks due to weak immunization systems.

The GPEI learnt that:

- due to underlying factors that affect poliovirus transmission, all countries will not respond to OPV campaigns and stop transmission with similar speed;
- in some contexts, it is necessary to tackle issues and focus interventions at a micro level to achieve coverage levels;
- programme performance data are often not accurate enough to guide programme planning and corrective action;
- technical solutions cannot compensate for basic management and accountability issues, nor political, societal and cultural factors;
- strong immunization systems are essential to prevent reinfection and outbreaks.

Lesson 3: A combination of innovations tailored to the country context can deliver success in even the most challenging conditions

4.16 To rapidly drive immunity levels above the thresholds needed to interrupt poliovirus transmission in the remaining four endemic countries, the GPEI needed to develop more effective tactics and tools both to reach the remaining missed children and to more effectively seroconvert them, especially in areas with a high enteric disease burden due to extremely poor sanitary conditions. It was necessary to more systematically identify who these children were and how they could be reached. Furthermore, the GPEI had to consider how to more accurately monitor the success of these efforts. This represented a substantial departure from previous approaches that were mainly focused on technical solutions with insufficient attention to operational tactics or societal issues.

4.17 The GPEI built on the technical innovations that had contributed to success in Egypt and focused on improvements in operations, monitoring and social mobilization. This included the development of a set of new tactics and tools including, but not limited to, strategies for "underserved" populations, the Short Interval Additional Dose (SIAD) strategy,[10] seroprevalence surveys and modelling, universal finger-marking, migrant and

[10] The SIAD approach involves administering two doses of monovalent OPV over the course of one or two weeks.

transit strategies, independent monitoring and Lot Quality Assurance Sampling (LQAS)[11] surveys. At the same time, the GPEI pursued the rapid development and licensure of a new bivalent formulation of OPV (bOPV), which maximized the impact of each contact with a child by tackling both of the remaining WPV serotypes with a new vaccine that achieved an efficacy close to that of each of the monovalent vaccines.

4.18 These approaches were first and most systematically applied in India. By 2010, over 95% of children in India were being reached in OPV campaigns, but the large birth cohort (26 million children per year) meant that the small percentage of children being missed still represented a population sufficient to maintain transmission. These missed children existed mostly in underserved populations, outside the usual health systems – nomads, slum dwellers, children of construction and brick kiln workers, or other mobile and migrant groups. Armed with the new bivalent vaccine and a more thorough understanding of its underserved and at-risk populations, India intensively applied a range of new tactics for reaching and protecting these children. On 13 January 2011, India finally recorded its last case of polio due to an indigenous virus in a two-year-old girl near Kolkata. Translating these approaches to the remaining endemic areas and instituting the requisite accountability mechanisms to substantially enhance the quality of vaccination campaigns is a core goal of the Plan.

India was able to interrupt transmission because of its ability to apply a comprehensive set of tactics and tools to reach and immunize all children. Innovations were introduced in:

- microplanning
- operations
- monitoring and accountability
- technology (e.g. bOPV)
- social mobilization
- surge support

4.3 New evidence that WPV transmission can be interrupted by the end of 2014

4.19 Lessons learnt from more than 20 years of successes and failures in polio eradication have informed the national Emergency Action Plans of the three remaining endemic countries. The full implementation of these plans and the intensification of necessary approaches to identify, access and immunize at-risk children who have been persistently missed are key components of the GPEI's strategy to interrupt poliovirus transmission globally (outlined in detail under Objective 1). New evidence from each of the remaining endemic countries strongly suggests that their polio-eradication programmes showed marked improvements in reaching and vaccinating chronically missed children in 2012. While interruption cannot be guaranteed by a particular date and various factors could intervene,

[11] The Lot Quality Assurance Sampling (LQAS) method classifies areas of interest corresponding to "lots" as having acceptable or unacceptable levels of vaccine coverage. This method detects pockets of low vaccine coverage and therefore directs focused vaccination efforts.

the remaining endemic countries are now on a trajectory to interrupt transmission by the end of 2014.

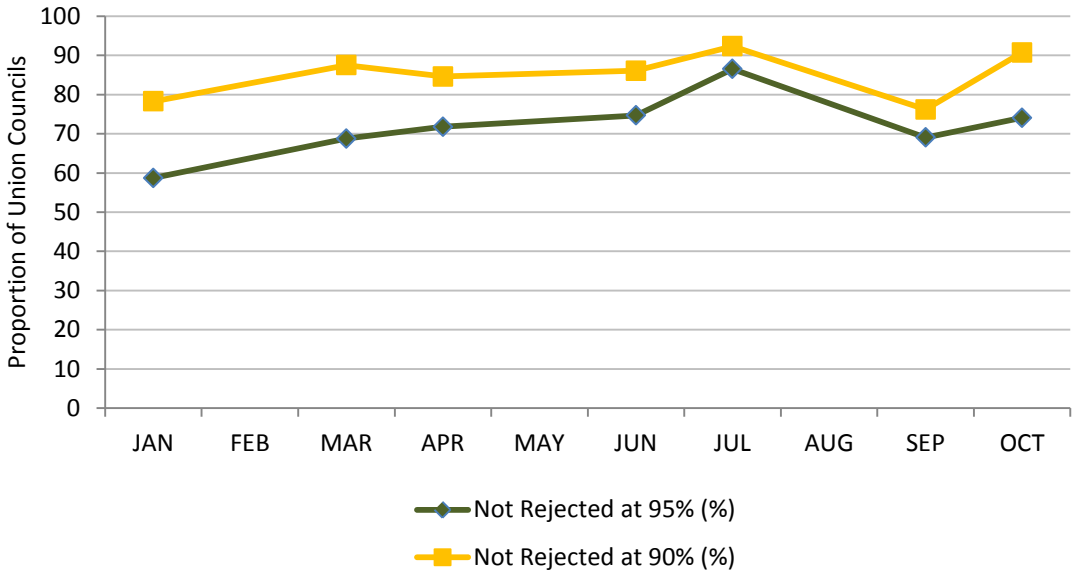
Evidence of progress

4.20 The most critical challenge to interrupting WPV transmission in the last poliovirus reservoirs is boosting OPV coverage to exceed the immunity levels needed to interrupt transmission. Accessing certain at-risk populations – particularly those children that have persistently been missed – has been the key challenge.

4.21 The year 2012 saw major breakthroughs in both SIA quality and access to missed children in most of the key poliovirus reservoir areas of each endemic country. In Nigeria, the proportion of very high-risk Local Government Areas in which vaccine coverage reached the estimated target threshold of 80% for stopping poliovirus transmission in that setting increased (Figure 5) from 10% in February 2012 to 70% in February 2013. In Pakistan, the proportion of highest-risk districts achieving the estimated target threshold of 95% in that setting increased from 59% in January 2012 to a peak of 74% in October; increasing insecurity in late 2012 compromised the capability to collect similar monitoring data through January 2013. In the 11 lowest performing districts in Southern Region of Afghanistan at highest risk for persistent transmission of polioviruses, the number of children inaccessible during the OPV campaigns declined from more than 60 000 in mid-2012 to some 15 000 by December 2012 (Figure 6).

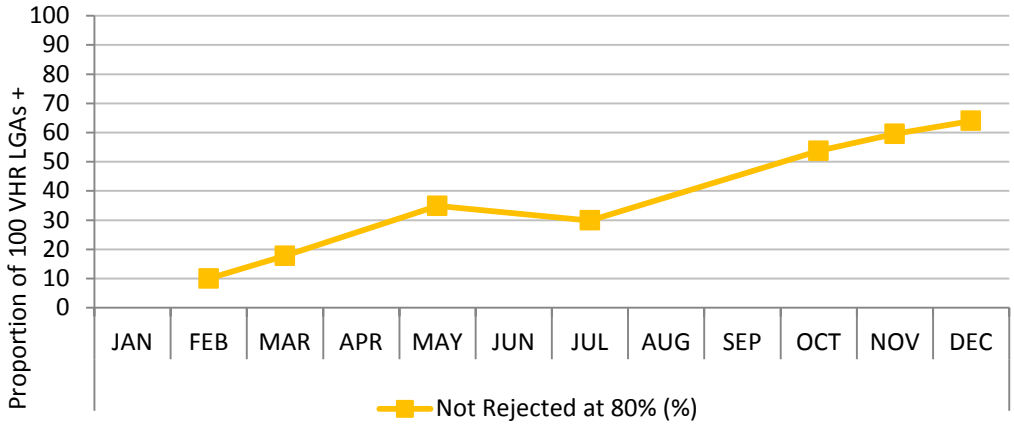
Figure 5: Improvement in SIA quality for select Pakistan districts[a] and Nigeria Local Government Areas,[b] 2012[c]

Pakistan



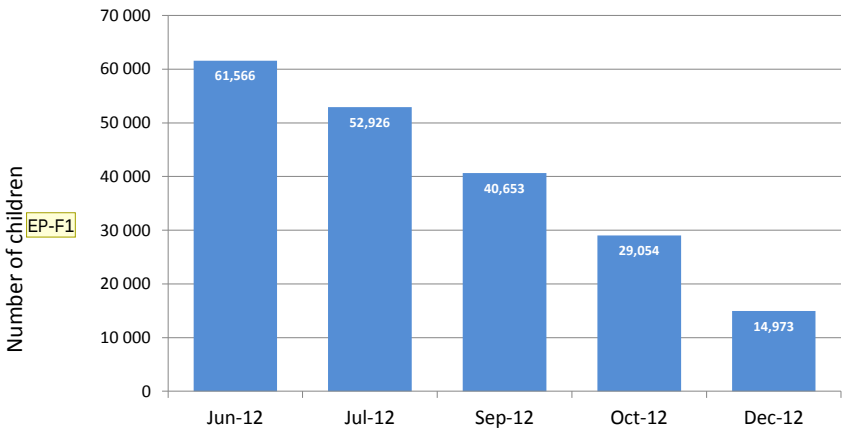
[a] Data based on past LQAS methodology, which has been updated per new global guidelines.
[b] December 2012. Nigeria using latest LQAS methodology.
[c] Trends based on data generated with LQAS.
NB: November and December 2012 data are not represented as LQAS was not conducted in Karachi and Khyber Pakhtunkhwa province due to insecurity.

Nigeria



+ Very high-risk Local Government Areas.
Source: WHO.

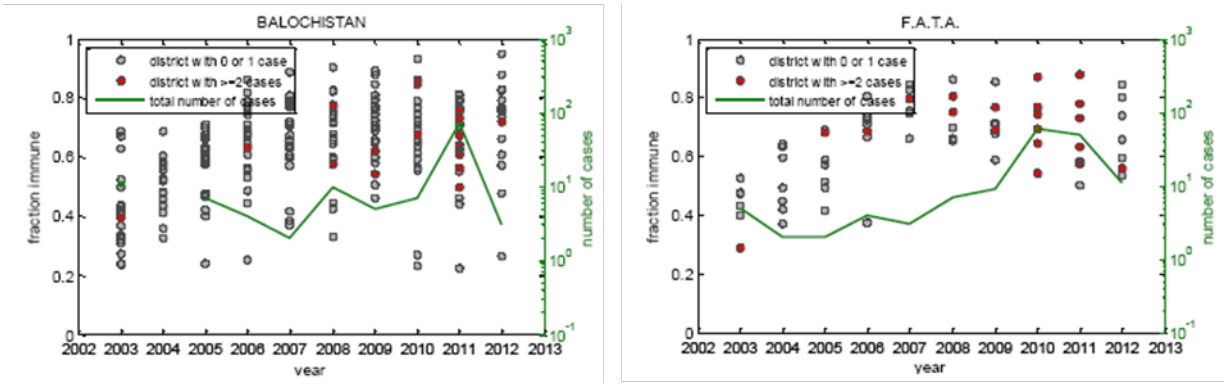
Figure 6: Reduction in inaccessible children in 11 low-performing districts in Southern Region Afghanistan,[a] June 2012-December 2012



[a] Government of Afghanistan data. Surveys not conducted every month.

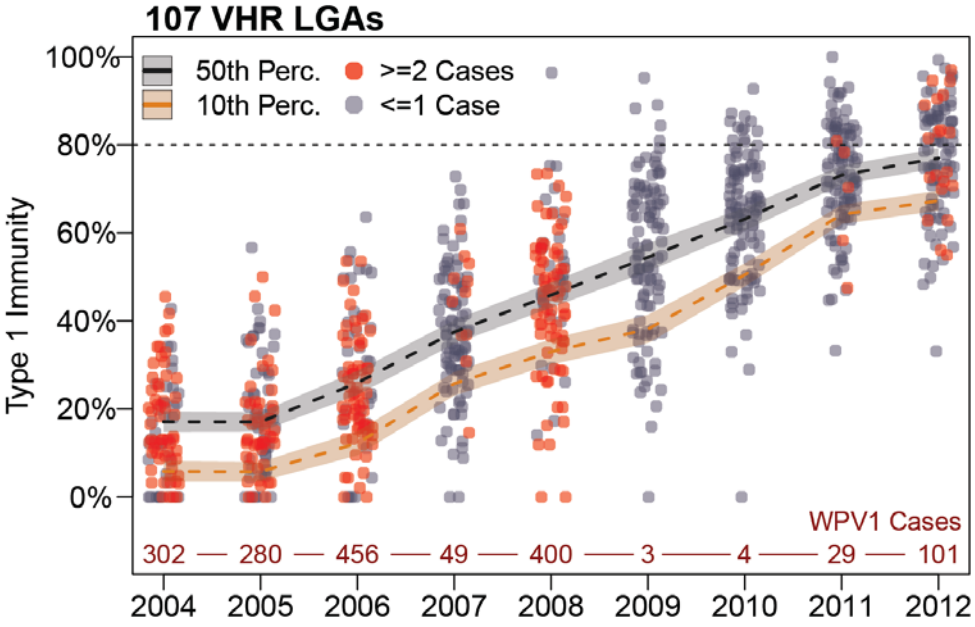
4.22 As a result of improved SIA quality, population immunity is rising. Past experience and trend line statistical evidence suggests the threshold for interrupting poliovirus transmission is 80% immunity in Nigeria and Afghanistan, and 90% immunity in Pakistan. Based on an analysis of the number of OPV doses children were receiving in each country by the end of 2012, estimates suggest the proportions of immune children are approaching these benchmarks (Figures 7 and 8).

Figure 7: Type 1 immunity changes over time for two key areas of Pakistan,[a] 2002-2013



[a] Government of Pakistan data.
NB: In the column of each year, a dot appears for each district in the state: red for 2+ cases and gray for 1 or 0 cases in that year. The height of each dot indicates estimated immunity based on non-polio acute flaccid paralysis (left y-axis). The total annual incidence of WPV1 cases in the state is shown by the green trace (right y-axis). Any breaks in the green trace are years of zero cases.
Source: Global Good analysis, 2013.

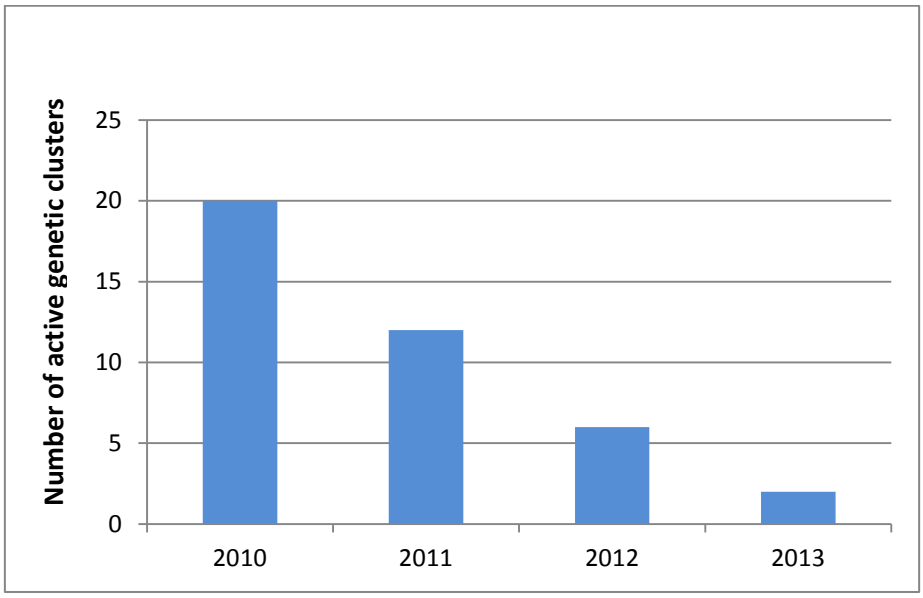
Figure 8: Type 1 immunity changes over time in very high-risk Local Government Areas of northern Nigeria,[a] 2004-2012



[a] Nigeria data analysis and modelling report, March 2013, EMOD polio team, Global Good fund
Source: Global Good analysis, 2013.

4.23 Most significantly, these improvements in OPV campaign performance and population immunity result in a substantial decrease in poliovirus genetic diversity and geographic extent, particularly in Afghanistan and Pakistan. In 2012, the number of WPV genetic clusters in these countries decreased markedly (Figure 9) and increasingly focused transmission concentrated in limited geographic areas, or reservoirs.

Figure 9: Decline in wild poliovirus genetic clusters in Pakistan and Afghanistan, 2010-2013



AFP, Acute flaccid paralysis.
Source: WHO.

4.4 The case for completing polio eradication

4.24 The benefits of reaching eradication continue to substantially outweigh the costs, even if there is a delay in interrupting the remaining WPV transmission in one or more countries.

Direct benefits of eradication and risks of polio reintroduction

4.25 The public health consequences of failing to complete polio eradication are dire. Research indicates that in a world where polio control (versus eradication) was the aim – and high-level population immunity waned as a result of the discontinuation of SIAs – taking into account current immunization levels, polio cases would be expected to increase rapidly to at least 200 000 cases annually in low-income countries, a rate comparable to the situation in 1998.[12] Not only would this generate significant public health and individual costs but it would place enormous strain on country health systems in managing large-scale polio outbreaks and epidemics.

4.26 From an economic perspective, completing polio eradication continues to provide significant benefit. A 2010 analysis of the long-term impact of the GPEI estimates that achieving eradication will generate net benefits of at least US$ 40-50 billion, mostly in low- and low-middle-income countries, from 1988 to 2035.[13] This study also finds that GPEI efforts disproportionately benefit low-income countries, with more than 85% of the net benefits experienced there. These findings hold even when taking into account rising programme costs and varying the assumptions on programme effectiveness. Other studies on

[12] Thompson K, Duintjer Tebbens RJ. Eradication versus control for poliomyelitis: an economic analysis. *The Lancet*, 2007, 369 (9570):1363-1371.
[13] Duintjer Tebbens RJ, Pallansch MA, Cochi SL et al. Economic analysis of the Global Polio Eradication Initiative. *Vaccine*, 2010, 29 (2):334-343.

the benefits of eradication have similarly found the health and net benefits to substantially exceed the financial costs of polio-eradication efforts.[14]

Indirect and intangible benefits of eradication efforts

4.27 The impact of the GPEI extends beyond polio, benefiting other global and country health priorities. Support to measles campaigns, the distribution of vitamin A supplements and enhanced global surveillance and response capacity for epidemic-prone diseases are just three areas that have benefited from polio-eradication staff and infrastructure and delivered clear public health dividends. Conservative estimates peg the value of the GPEI's coordination with other health initiatives at US$ 17-90 billion in benefits associated with[15] the distribution of vitamin A supplements and an estimated 1.1 (conservative) to 5.4 (maximum) million childhood deaths averted as of the end of 2010.[16] Looking ahead, a well-organized and supported legacy plan that builds on relevant aspects of the polio network's lessons and infrastructure would drive gains across other health priorities. The GPEI infrastructure can provide a strong platform for addressing other vaccine-preventable diseases (VPDs) and support national health systems. Exploring this potential forms a core part of the Plan.

4.28 The significant and incalculable "intangible" impact of the global eradication programme cannot be disregarded. The programme's size and scope have required collaboration and cooperation across countries and institutions, and between the public and private sectors. New relationships, communication channels and processes have been developed that can benefit global health more broadly. Vulnerable populations, including those in insecure areas, have been reached as never before. Achieving eradication can provide further momentum for similarly ambitious mortality and morbidity reduction goals (e.g. measles elimination) and demonstrate the impact that coordinated and concentrated action can achieve.

4.29 The GPEI has developed this comprehensive Plan to address all aspects of polio eradication, exploit the unique opportunity to stop all polio disease once and for all, and complete the initiative. The Plan builds on new tactics and progress in interrupting WPV transmission and the development of new tools and strategies for managing the risks of vaccine-derived poliovirus. This Plan provides the best ever opportunity for completing polio eradication and capitalizing on the huge national and international investments in this initiative that have been made to date.

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[14] Thompson K, Duintjer Tebbens RJ. Eradication versus control for poliomyelitis: an economic analysis. *The Lancet*, 2007, 369 (9570):1363-1371; Musgrove, P. Is polio eradication in the Americas economically justified? *Bulletin of the Pan American Health Organization*, 1988, 22 (1):1-16; Bart KJ, Foulds J, Patriarca P. Global eradication of poliomyelitis: benefit–cost analysis. *Bulletin of the World Health Organization*, 1996, 74 (1):35-45; Kahn MM, Ehreth J. Costs and benefits of polio eradication: a long-run global perspective. *Vaccine*, 2003, 21 (7-8): 702-705; Aylward B, Acharya A et al. Global public goods for health. In: Smith RD, Beaglehole R, Woodward D, Drager N, eds. *Global public goods for health: Health economic and public health perspective*. Oxford, Oxford University Press, 2003:33-54.

[15] Duintjer Tebbens RJ, Pallansch MA, Cochi SL et al. Economic analysis of the Global Polio Eradication Initiative. *Vaccine*, 2010, 29 (2):334-343.

[16] Ibid.

5. Objective 1: Poliovirus detection and interruption

Poliovirus Detection and Interruption		
Main Objectives	**Outcome Indicators**	**Major Activities**
Complete the interruption of wild poliovirus transmission globally and more rapidly detect and interrupt any new outbreaks due to vaccine-derived polioviruses	**All wild poliovirus transmission stopped by end-2014** **All new cVDPV outbreaks stopped within 120 days**	**1. Strengthen global surveillance** **2. Maintain an appropriate SIA schedule** **3. Enhance OPV campaign quality** **4. Enhance the safety of OPV operations** **5. Prevent and respond to polio outbreaks**
Monitored by the IMB		

5.1 Introduction

5.1 The *GPEI Strategic Plan 2010-2012* saw a number of breakthroughs. The intense focus on interrupting transmission led to success in India – widely considered the country with the most technically challenging conditions for interrupting poliovirus transmission in the world. The 2010-2012 Plan also resulted in the lowest ever number of outbreaks caused by importations into polio-free areas and the interruption of transmission in two of the countries in which transmission had been re-established (i.e. Angola and the Democratic Republic of the Congo).

5.2 The launch of the *Global Polio Emergency Action Plan* in May 2012 put the programme on an emergency footing to overcome the challenges in the remaining three endemic countries and vigorously protect polio-free areas. By the end of 2012, the GPEI reported the lowest number of cases ever globally, in the fewest number of countries. Major gains were made towards overcoming the chronic challenges to interrupting transmission in the remaining endemic countries. However, in some of the key reservoir areas, new, emerging risks were threatening these gains, particularly attacks that caused the death of polio workers in Pakistan and Nigeria, requiring new approaches to ensure the safety of workers while addressing the underlying issues that contributed to these attacks.

5.2 The goal

5.3 With Objective 1, the GPEI aims to take advantage of the breakthroughs, to complete the interruption of WPV transmission globally and to more rapidly detect and interrupt any new outbreaks due to VDPV. The key working targets on the path to this objective are to achieve

the interruption of WPV 1 by the end of 2014, and to stop all new outbreaks due to cVDPVs within 120 days of an index case.

5.3 What is required to interrupt transmission?

5.4 Interruption of WPV transmission requires rapid detection of all poliovirus transmission (WPV and VDPV) anywhere in the world, overcoming the obstacles to reaching all children with OPV in the three remaining endemic countries, and protecting areas prone to outbreaks and reimportation by maintaining immunity levels above the thresholds needed to interrupt transmission and by rapidly responding to any new outbreaks.

5.4 What will be done?

Major activities:

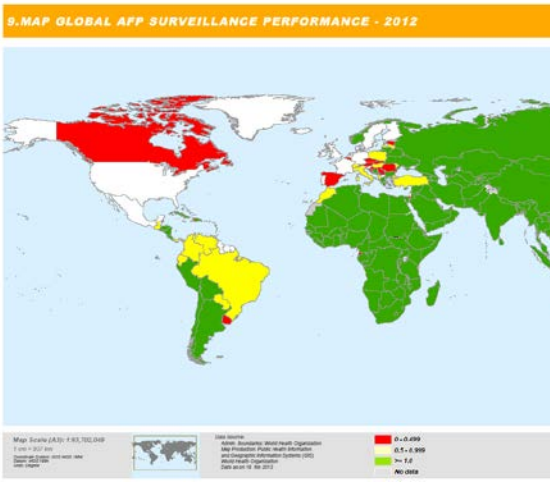
1. Strengthening global surveillance to detect virus circulation
2. Maintaining an appropriate supplementary OPV immunization schedule
3. Enhancing OPV campaign quality to interrupt endemic transmission
4. Enhancing the safety of OPV campaign operations in insecure areas
5. Preventing and responding to polio outbreaks

Activity 1: Strengthening global surveillance to detect virus circulation

5.5 Global surveillance for poliovirus is fundamental to achieving and sustaining global polio eradication. Sensitive surveillance is vital for the programme to rapidly detect all circulating poliovirus and to guide eradication activities. Acute flaccid paralysis (AFP) surveillance (Figure 10) will remain the primary mechanism for the detection of poliovirus, with emphasis on endemic and high-risk countries. In addition, environmental surveillance will be further scaled up as a complement to AFP surveillance for detecting the presence of poliovirus in infected areas and populations. This will facilitate the more rapid identification of outbreaks in high-risk areas, provide additional information to validate the interruption of transmission and help document the elimination of vaccine-related strains after OPV cessation.

Acute flaccid paralysis surveillance

Figure 10: Global acute flaccid paralysis disease surveillance performance, 2012



5.6 For the three regions not certified polio-free at the end of 2012, the priority will be to close remaining gaps in AFP surveillance. Based on the global epidemiology of polio in mid-2012, the areas of greatest initial focus will be northern Nigeria, the Federally Administered Tribal Areas/Khyber Pakhtunkhwa (FATA/KP) Pakistan, southern Afghanistan and, potentially, bordering areas of neighbouring countries, which regularly become reinfected due to population movements and poor routine immunization coverage (such as the countries bordering Lake Chad and west African countries bordering Nigeria). These areas will require particularly intensive AFP and possibly supplementary surveillance activities to detect and respond to any residual transmission.

5.7 In these areas, particular attention will be given to ensuring documented, active (at least monthly) AFP surveillance at all major reporting sites. As hospital involvement is critical to sensitive surveillance, the review of AFP surveillance procedures at major hospitals in risk areas is ongoing, with a schedule of regular refresher trainings for staff at these establishments. In areas where performance is suboptimal, the focus will be on staff training, the institution of appropriate management and accountability structures, and in-depth analysis of surveillance data. In addition, the GPEI is working to institutionalize systems for modifying surveillance networks through the tracking of health-care providers visited by AFP cases and updating reporting networks as needed.

5.8 Special efforts will also be made to track AFP sensitivity in marginalized and at-risk populations. For example, in Pakistan, health-care providers for Pashtun, migrant and nomadic groups will be specifically identified and incorporated into the surveillance reporting and informant networks. The focus will also be on expanding networks of community informants to supplement these more official channels and, potentially, establishing rewards for polio-confirmed AFP cases. Finally, where orphan viruses are detected, an investigation will be conducted and surveillance procedures will be reviewed, as appropriate.

5.9 In areas at particular risk of missed transmission, in addition to the above, targeted AFP community searches, six-monthly active case searches and case searches during vaccination campaigns will be conducted to complement existing AFP surveillance activities. Regional and national plans will elaborate specific activities and budgets, based on quarterly regional risk assessments.

5.10 In polio-free countries, regular risk analyses (quarterly for those regions not yet certified as polio-free, and six-monthly for the three certified regions) will identify areas of suboptimal surveillance for targeted corrective actions. For the three regions that are certified polio-free – the Americas, Europe and the Western Pacific – the priority will be to sustain AFP surveillance at certification standard.[17] In endemic and at-risk countries, an even higher standard will continue to be applied. A similar principle will operate for those countries that

[17] Certification-standard performance is defined as the achievement of a non-polio AFP rate of at least one non-polio AFP case per 100 000 population aged <15 years, with adequate stool specimens collected from at least 80% of cases. Specimens are defined as "adequate" if two specimens are collected within 14 days of onset of paralysis, at least 24 hours apart, arriving in the laboratory in good condition. All specimens must be analysed in a laboratory accredited by WHO.

have been polio-free for several years in regions that have not yet been certified. This will be achieved through mobilizing heightened political commitment to the goals of the polio endgame, allocating additional resources where needed – including for laboratory capacity – and increasing WHO regional office support to countries to revitalize AFP surveillance. Oversight of surveillance quality will be reinforced by Regional Certification Commissions (RCCs).

Environmental surveillance

5.11 The systematic sampling of sewage for polioviruses currently occurs in dozens of locations across four countries as part of the GPEI. This environmental surveillance will be geographically expanded to help identify any residual transmission in endemic areas, to provide early indication of new importations into recurrently reinfected areas, and to document the elimination of Sabin viruses following the tOPV-bOPV switch and eventual bOPV cessation. This is planned to include sites in Afghanistan, Nigeria and high-risk areas and routes for importation as well as selected areas where OPV cessation must be monitored particularly closely due to a history of cVDPV emergence, or the presence of a national OPV production facility. Consequently, at least 15-20 additional sampling sites will be added by the end of 2015.

Special surveillance

5.12 AFP and environmental surveillance will be complemented by special surveillance studies where needed with four specific approaches. First, there will be expanded use of serological surveys, on at least an annual basis, to more rapidly assess and validate population immunity levels, stratified by age group, in any areas with persistent poliovirus transmission. Second, large-scale stool surveys and expanded contact sampling, particularly from all inadequately-sampled AFP cases, will be used to more rapidly rule out ongoing poliovirus transmission in recently reinfected and/or endemic areas that are no longer reporting polio cases. Third, special studies will be scaled up among patients with primary immunodeficiency syndromes to more systematically detect immunodeficiency-associated vaccine-derived polioviruses (iVDPVs) in both industrialized and middle-income countries. Finally, special environmental surveillance studies will be conducted for species C enteroviruses in areas with recurrent cVDPV emergences and/or risk factors for cVDPV emergence.

Activity 2: Maintaining an appropriate supplementary OPV immunization schedule

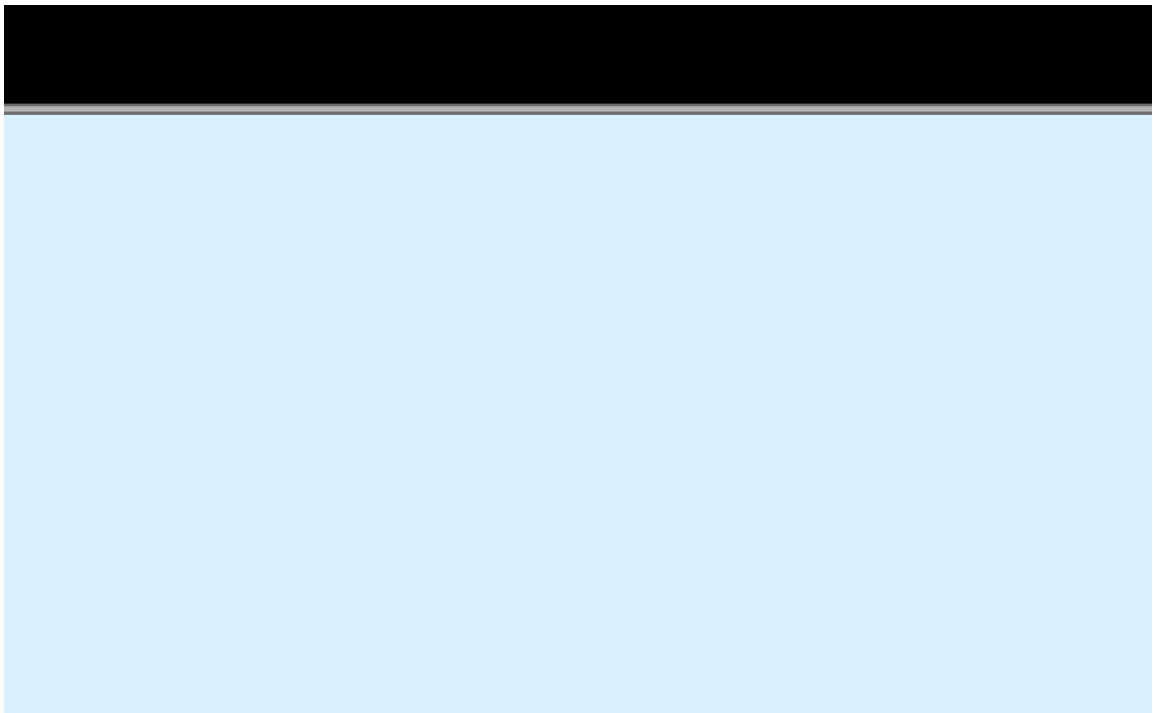
5.13 SIAs are, along with AFP surveillance and routine immunization, a fundamental part of the overall strategy for polio eradication. SIAs are essential for simultaneously boosting both the humoral and intestinal immunity of infected populations to interrupt virus transmission and to maintain population immunity above the threshold for reinfection in high-risk polio-free areas. SIAs can also reduce the risk of cVDPV emergence and spread in areas at risk. Planned SIAs that are conducted on a national or subnational basis are typically referred to as National or Subnational Immunization Days (NIDs or SNIDs). House-to-house mop-up campaigns, outbreak response campaigns and Short Interval Addition Dose (SIAD) activities are all types of SIAs.

5.14 The planning of NIDs and SNIDs is guided by a combination of risk assessments and epidemiology. The need for these SIAs in different areas will vary by risk and programme objectives. In 2013-2014, polio-endemic areas of Afghanistan, Nigeria and Pakistan will require the most intensive schedules of NIDs and SNIDs to rapidly build the immunity needed to interrupt transmission. In areas at highest risk of recurrent importation from these endemic areas, particularly in west and central Africa, the objective of the continued NIDs/SNIDs during this period is to mitigate the potential for an outbreak following a WPV reintroduction. Finally, in areas with a history of cVDPVs, such as Somalia, SIAs will be conducted to reduce the conditions favouring VDPV emergence and spread. Table 4 and Figure 11 illustrate the planned SIA schedules for these settings. The specific SIA plans for the entire 2013-2018 period are available in the document entitled *GPEI Financial Resource Requirements 2013-2018*.

Table 4: Planning framework for OPV campaign schedules

Country Status/Risks	Country/Area (examples)	Annual SIA Rounds, 2013-2018
Polio endemic	Northern Nigeria, Pakistan, southern Afghanistan	6-8
Recurrent polio importations	West Africa, Chad, Sudan, South Sudan	2-4
Recurrent cVDPV emergence	Northern India, Somalia, Ethiopia, eastern DR of the Congo	2-4

Figure 11: Indicative OPV campaign plans in Africa, 2013-2018



Activity 3: Enhancing OPV campaign quality to interrupt endemic transmission

5.15 Interrupting polio transmission requires that population immunity reach a level where poliovirus is unable to find sufficient numbers of susceptible individuals to sustain transmission. This has been achieved in all but the three remaining polio-endemic countries of the world. Even in these countries, the virus only persists in populations on the margins of society, in areas where health services are largely non-existent and oversight and management are weakest. Routine immunization coverage in these areas is low and repeated SIAs have fallen short of reaching enough children a sufficient number of times with OPV. To achieve interruption of poliovirus transmission in these settings, SIA and immunization management and quality will be enhanced.

Enhancing SIA management and quality

5.16 Overcoming the challenges in these last pockets of poliovirus transmission requires that the full experience and strength of national governments, local leaders and their GPEI partners be brought to bear on these areas. The lessons learnt from successes in other challenging settings, coupled with a commitment to innovative local problem solving, are essential for success. Particular emphasis and attention are needed in the seven major areas outlined in the following section. For each of the remaining endemic countries, further details on the application of these approaches are available in Annex A.

Microplanning

5.17 The local microplan is the blueprint that maps out all the necessary components – the houses, the vaccination teams and their daily tasks, key influencers, social mobilizers, timings and logistics – for ensuring vaccinators reach all children with OPV. Incomplete and poor-quality microplans in these polio persistent areas are one of the primary reasons for poor campaign quality and accountability. Despite years of campaigns and guidance, microplans are still grossly inadequate in some areas in each of the remaining endemic countries. However, serious efforts are now under way to correct this root problem.

5.18 In Nigeria, the programme introduced house-based microplans for the first time in 2012, heavily informed by the success in areas of India that overcame similar issues with missed areas and missed populations. The development of house-based microplans requires a physical walk-through of all areas by local leaders and supervisors to determine daily vaccinator work areas by enumerated households. These microplans are tightly linked with vaccinator tally sheets, capturing the teams' work by household and allowing cross verification. This is in contrast to previous microplans that simply named an area, established an estimated number of children that the team should cover and allowed the teams to simply record tallies of their achievements, making it difficult to hold them accountable for missed children or areas.

5.19 In Afghanistan, microplans are being improved further in volatile Southern Region to define how much accessibility the programme has in each area and to identify individuals or groups who have access. The approach is guided by the principle that all populated areas are accessible to someone. These community-based, access-enhanced microplans allow the programme to identify exactly which type of person is acceptable in each context to guide planning and ensure that trusted faces are presented at each doorway. In Pakistan, the targeted violence against health workers in late 2012 has required more extreme

modifications to microplanning. Health-worker safety has become paramount and assessments of local law enforcement and security officials now form an integral part of the local microplans.

5.20 In all three endemic countries, the microplans are being expanded to ensure the integration of social mobilization activities, including details of local influencers, and to more effectively reach children outside of households. More robust, monitored plans are being developed for teams at marketplaces and major transit points, incorporating the detailed mapping of nomadic groups and their traditional routes of travel and temporary settlement areas. New technology is also being used in some areas to enhance campaign microplanning through digital mapping to validate and refine the plans and to identify missed areas.

Front-line vaccination workers

5.21 At the heart of the polio-eradication programme globally are the front-line workers who ensure that polio vaccines reach every child. When vaccinators and supervisors with the right profiles are recruited, trained and supported through effective supervision, even the most difficult areas achieve very high coverage. In the areas where the virus continues to circulate, one inevitably finds weaknesses in this aspect of the programme. The situation is no different in the persistent poliovirus transmission areas of Afghanistan, Nigeria and Pakistan. In recognition of the importance of these front-line workers, many of whom put themselves at personal risk, all three countries raised the daily wage rates for vaccinators in 2012.

5.22 A major emphasis in each of the remaining endemic countries will be to establish vaccinator selection committees with local membership and find workers who are both acceptable to the local community and as accountable as possible to local authorities. Standards for team composition will be disseminated and tracked to ensure that teams have the right mix of members who are acceptable to local communities, can enter households to find all available children and can be held accountable for their performance.

5.23 These programmes will also seek to retain a higher proportion of vaccinators and to overhaul training procedures with a focus on interactive skill-based training wherein team members demonstrate their abilities before heading out to the field. Data from many countries, most recently Pakistan, show a strong correlation between caregiver satisfaction with team performance and vaccine acceptance; caregivers are more likely to refuse OPV when they are not satisfied with team performance. Maintaining trained and motivated on-the-ground staff who understand the community dynamics, speak the local language and are socially acceptable to deliver OPV and interact with mothers is key to success. A new interpersonal communication skills kit is being produced and special training conducted in several high-risk areas of Nigeria and Pakistan to ensure vaccinators are able to present themselves to caregivers both courteously and professionally. In Afghanistan, a similar module was rolled out in select districts of Kandahar in the last quarter of 2012. The focus in the future will be to apply such strategies more broadly and consistently, especially through 2013-2014.

Social mobilization and community engagement

5.24 Experience throughout the GPEI has shown that poliovirus circulation stands little chance of surviving in fully mobilized communities, even in the most difficult contexts. Many countries have also demonstrated the importance of demand-generation for OPV to create local ownership. In the areas of persistent transmission in the three remaining endemic countries, both significant gaps and real opportunities for generating demand for OPV exist. Securing the buy-in of the most marginalized and disaffected communities to accept OPV is particularly vital to complete polio eradication. Past strategies have proven successful, as demonstrated by decreasing vaccine avoidance in all country programmes (Figure 12). Looking ahead, the GPEI's major emphasis will be to focus communication and social mobilization activities to the specific social, cultural and political context of each infected area, with less of the larger global or national flavour of the campaign. Communication activities will be tailored to specific target audiences, with greater engagement with those individuals who can credibly deliver messages to those most sceptical of the programme.

5.25 Fundamental to improved acceptance of OPV is to understand the needs of communities through appropriate social research and to match those needs with the capacity of the programme to deliver them. This research may show that communities want additional health interventions, such as deworming tablets. Such findings will be analysed and, where feasible, systematically integrated into operational and financial planning. Equally, the social research may indicate basic infrastructure and service demands, such as sanitation or schooling. The GPEI will work with the government and relevant partners to supplement efforts to meet these needs according to the programme's capacities.

5.26 Social mobilization networks (Figure 13 and Table 5) have been scaled up in all remaining polio-endemic countries in 2012, with early data showing that, in communities where these volunteers are deployed, there are higher rates of campaign awareness, increased conversion of refusals and reduced numbers of missed children. These networks include two types of mobilizers: those who work at the household level, going door-to-door to engage and promote polio vaccination with parents and caregivers, and those who reach out to community and religious leaders to seek their support for OPV campaigns. For the household level, mobilizers are trained and supported to recognize and address the concerns of communities, provide accurate information through locally appropriate channels and enable parents to make informed decisions. Interpersonal communication skill building is aimed at establishing trust with parents and caregivers to immunize their child with OPV every time it is offered. At the community level, influential local people such as imams, priests, village heads, school teachers, businesspeople and landowners are identified and engaged to act as key influencers at community meetings, make announcements in places of worship or go door-to-door to encourage resistant parents and caregivers to accept OPV. Such influencers are highly effective in creating a supportive and safe environment and in building confidence in the safety and efficacy of the vaccine.

5.27. From a message creation perspective, social data will be utilized to develop appropriate content, deliver information through credible sources and identify channels that reach all communities. Political advocacy and mass media will continue to play an important role, reinforcing local outreach. As endemic polio has now been restricted to communities with

large and predominantly Muslim populations, a greater effort is under way to ensure the right mix of voices are in place to support eradication efforts. International and regional support will help ensure that advocacy plans and partnerships engage and enlist the help of such diverse and sometimes opposing groups as political parties, academics, and religious and cultural groups. Partnerships with a broad spectrum of religious and medical institutions are being rolled out and will be expanded in all polio priority areas through 2014.

Monitoring

5.28 In 2012, major gains were made in the monitoring of OPV campaign performance in the remaining endemic countries. A standard monitoring framework now covers the three phases of campaign activity – from planning to implementation to post-campaign assessment. Technological advances in data transmission over mobile networks have helped these countries to improve the timeliness of their information flows. All three countries have established emergency operation centres at the national and critical subnational levels to review standardized information, often flowing at near real-time speed, on campaign preparedness and implementation. Standards for campaign preparations have been communicated to local officials in all three countries' infected areas. Performance in meeting those standards is now measured at predefined intervals in advance of each campaign, accompanied by criteria for deciding when an activity should be postponed due to inadequate preparation.

5.29 Once campaigns have started, the emphasis shifts to in-process monitoring. The local evening vaccinator team meeting becomes the critical platform for identifying gaps in implementation and taking immediate corrective action. All the endemic countries are revising their monitoring procedures to ensure that missed children are identified each day, examining the reasons they were missed and the progress in covering them. Indicators on daily performance are also transmitted to emergency operation centres where they are analysed and flagged for action, especially in Nigeria and Pakistan. When implementation is complete, end-process evaluations are used to gauge the overall quality and identify areas needing further work or focus during the next SIA. Market surveys and independent monitoring provide data across all campaign areas. Of particular importance, the remaining endemic countries have also adopted the new "gold standard" for gauging campaign quality – Lot Quality Assurance Sampling (LQAS). This methodology strikes the best balance between ease of field implementation and statistically-reliable results that can be used to track trends over time in the most sensitive areas.

5.30 For social mobilization interventions, pre-, intra- and post-campaign monitoring is being used to ensure real-time course corrections in planning, implementation and assessment in all infected areas. To facilitate this, the GPEI has begun to refine the LQAS and independent monitoring processes to produce more consistent social data for understanding the reasons for missed children. These data guide catch-up activities and direct "intra-round" communications planning to increase OPV acceptance. This is being complemented in 2013-2014 with special investigations using a standardized tool to answer specific questions, such as the reasons for persistent transmission in areas of reported high coverage, the social and operational issues in areas with clusters of zero-dose non-polio AFP cases, and areas with chronic refusal households.

5.31 Monitoring systems for communications will continue to evolve through the endgame period. The PolioInfo system – now implemented in Afghanistan, India, Nigeria and Pakistan – already allows for regular monitoring of field-level activities, linked to a global database. Standard indicators are regularly monitored and presented in a dashboard format, to measure communication performance, identify issues, develop higher-impact messaging and demonstrate programme results. Media monitoring and other tactics will be scaled up to ensure discussion in the public sphere remains supportive of the eradication effort.

Surge support

5.32 Achieving repeated high-quality OPV campaigns in the persistent polio transmission areas requires a level of rigour and attention that is often overwhelming for the weak health system infrastructures in these areas. A consistent contributing factor for continued poliovirus circulation in persistent pockets is an outright lack of trained human resources and technical expertise – health-worker positions sometimes remain vacant for years, if they even exist at all. The GPEI approaches this gap in two ways: to quantify the health-worker gaps and work with officials to find solutions; to fill the gaps with a surge of additional human resources at the subdistrict level to supplement the existing capacity until vacancies are filled. Success in India showed that this approach can successfully provide the level of field presence and accountability required to achieve quality campaigns relatively rapidly. Before 2012, none of the three endemic countries had this kind of support. In 2012, that situation was reversed, with WHO and UNICEF recruiting more than 5000 field-level technical and social mobilization workers on behalf of the governments to assist local eradication efforts.

5.33 The focus in 2013-2014 is to optimize the number, distribution and skill set of this human resource surge and to track the progress in filling health-worker vacancies. Particular attention is given to further equipping and training these field-level staff so they provide the most effective support possible to local government counterparts to interrupt polio and improve immunization coverage rates.

Technical innovations

5.34 Vaccines remain the core tool of the GPEI and the focus of technical innovation and research. The development and expanded use of bivalent OPV (bOPV) in 2009-2010 has allowed the programme to maximize immunogenicity to the remaining WPV serotypes (types 1 and 3) for each contact with vulnerable children. This resulted in record-low levels of WPV type 1 and 3 in circulation globally in 2012, with data suggesting that WPV type 3 may now be on the verge of eradication. The GPEI has also spearheaded the development of other vaccine products, including monovalent OPVs, and conducted key research to reduce the costs of IPV use and to better understand its impact in developing country settings. As global polio eradication achieves various milestones, the GPEI will tailor its use of these vaccines to best fit the epidemiological context and goals.

5.35 The GPEI is also innovating the way programmes are monitored by taking advantage of advances in geographic information systems and data transmission over mobile-phone networks. In both Nigeria and Pakistan, campaign data that used to be laboriously compiled on paper and transmitted by hand or fax increasingly flow in real time through entry into smartphones. In Nigeria, the precise location of polio cases is fixed and mapped using global positioning devices (GPS) and geographic information systems (GIS) that allow more in-

depth analysis of locations where polio continues to occur. Nigeria is also leading the way in an unprecedented effort to use digital geographic tools to identify areas where children have not had the opportunity to be vaccinated and allow real-time analysis of areas that have been missed or overlooked so they can be pursued. This is the first time these tools have been used in this way and on this scale.

Operational tactics

5.36 As detailed in the section on "Lessons learnt", the GPEI continues to challenge and test its fundamental operational tactics to find better ways of achieving its goals. One example is the expanded use of the Short Interval Additional Dose (SIAD) strategy, which exploits shorter intervals between campaigns to more rapidly boost immunity. This scheme is particularly relevant in security compromised areas to fully take advantage of windows of opportunity, in outbreak situations to rapidly boost immunity, and in areas where persistent management weaknesses have left children unprotected for a long period of time. Use of the SIAD strategy will be considered in each of these situations in all polio-endemic and outbreak countries, as appropriate.

5.37 Other examples of operational innovations include the programme's exploration of better ways to disburse funds to front-line workers. The payment of thousands of volunteer vaccinators over vast geographical areas in settings with poor infrastructure and management accountability systems is a big challenge and a considerable risk to achieving high-quality SIAs. In the remaining endemic countries, mechanisms for the direct disbursement of funds to front-line workers are now in place in many areas to reduce the number of transactions between fund source and vaccinator, minimize gaps in payments and eliminate "ghost teams" and underage vaccinators. Discussions are now under way in Nigeria to push this further by exploring the possibility of using vaccinator mobile phones as a method of payment.

Research priorities to improve campaign impact

5.38 Research to identify and assess strategies that may further improve the impact of each campaign is another area within this activity. The current priorities for assessment are:

- expanded target age groups: experience from large outbreak response activities in 2010-2011 suggests that expanding the target age group for OPV beyond five years of age in SIAs may accelerate the interruption of polio transmission due to a number of factors, particularly improved coverage among the very young;
- inactivated poliovirus vaccine: increasingly strong evidence indicates that a supplementary dose of IPV can substantially boost mucosal immunity in OPV-vaccinated populations, potentially accelerating eradication.

Although extending these approaches to the remaining endemic areas has substantial communications and logistical implications, both are being evaluated further for use in endemic reservoir areas.

5.39 The polio programme in Pakistan is collaborating with Aga Khan University to pilot the use of IPV with OPV in 2013 as an additional tool to rapidly build an immune response in children that have not been easily reached through regular polio campaigns or routine immunization. Pakistan will investigate the operational feasibility of using IPV with OPV in

campaigns in districts of the FATA and Balochistan, where difficult access and management issues have prevented the programme from building immunity to the levels needed to interrupt transmission. These efforts will be combined with other health promotion activities and the mobilization of paediatricians to address families' other health concerns.

Activity 4: Enhancing the safety of OPV campaign operations in insecure areas

5.40 Although the GPEI has long experience in working in insecure areas, only in late 2012 were polio vaccination workers targeted during OPV campaigns by violent, coordinated attacks that left workers injured or dead. This development establishes a new reality in some of the remaining infected areas, to which national programmes must adapt as they extend their reach to those last populations and places where WPV remains endemic or, in the case of Somalia, where the cVDPV outbreak is persistent. These places and populations are often characterized by a long history of neglect, receiving little or no services or external assistance, which has contributed to an environment favourable to suspicions, conspiracy theories and other issues that appear to underpin the violent reaction the programme has encountered in its work to reach some of these areas.

5.41 Addressing this new reality has required the establishment of a new overarching framework for operating in insecure areas, with tailored approaches for each priority insecure setting. The basic elements of this framework include:

- **operational adjustments to polio campaigns:** SIA operational adjustments are being made to reduce the exposure of the programme and vaccinators to potential threats (e.g. phased or low-profile campaigns, fixed site, etc.), based on district-specific risk assessments;
- **programme safety and security:** coordination between civilian, health and security services is being enhanced to improve the physical safety of vaccinators and facilities where necessary (e.g. through provincial security coordination committees, police escorts, etc.), again based on district-specific risk assessments;
- **community demand:** particular attention is being given to improving the local community demand for access to vaccination and basic services through a combination of awareness-raising activities around the disease, its consequences and prevention and, if appropriate, by coupling OPV with the delivery of other services or interventions;
- **religious leaders' advocacy:** advocacy is being increased by international, national and local Islamic leaders to build ownership and solidarity for polio eradication across the Islamic world, encouraging the protection of children against polio, the sanctity of health workers and the neutrality of health services;
- **measures to prevent poliovirus spread:** increased emphasis is being given to reducing the risk of spread from such areas by continuing an intensive SIA strategy in surrounding areas and ensuring the vaccination of travellers in and out of infected areas to the degree possible. Permanent immunization teams have been established on the periphery of access-compromised areas in an effort to increase the opportunities for immunizing any children moving in and out of these areas. Such teams are also operating around-the-clock at important border crossings between Pakistan and Afghanistan, to cover travellers between the two countries and reduce the international spread of the virus.

5.42 This overall approach and the tactics at the national level in particular will be formally reviewed and adjusted on a six-monthly basis to assess lessons learnt and take corrective or

new actions as needed. If the polio programme and local community are unable to address these security threats in some areas, or are unable to access sufficient children to stop transmission, a series of contingency strategies and tactics will be implemented. Additional actions at that time could include a combination of new measures to further reduce the risk of spread from any remaining infected area(s) (e.g. consideration of a standing recommendation for vaccination of travellers under the International Health Regulations); steps to further increase the impact of each immunization contact in these areas (e.g. expanded target age groups; house-to-house delivery of IPV, potentially using hand-held jet injectors); extraordinary negotiations to access children through ceasefires, Day of Tranquility or similar measures when virus transmission is restricted to a very small area; and exceptional measures for the safety and security of vaccinators in very limited areas.

Activity 5: Preventing and responding to polio outbreaks

5.43 The primary strategy for reducing the risk of polio outbreaks following WPV importations or due to the emergence of a cVDPV will be the rapid strengthening of immunization services, as outlined in Objective 2 of this Plan. This will be complemented by continued SIAs in areas at highest risk of importations and/or cVDPV emergence as summarized in Activity 2 above.

5.44 In addition, to further reduce the international spread of polioviruses, all countries will be urged to fully implement WHO's existing recommendations for the vaccination of travellers, as outlined in Chapter 6 of WHO publication *International travel and health* and reinforced by the WHO Executive Board in January 2013.[18] In 2014, the Director-General of WHO may convene a Review Committee, under the International Health Regulations (2005), to advise on the need for a standing recommendation in 2015 on the vaccination of travellers to and from any area with persistent poliovirus transmission.

5.45 A more aggressive approach to outbreaks of both WPV and VDPV will be implemented with the goal of stopping any new poliovirus outbreak within 120 days of the index case. Building on experience from more than 100 WPV and VDPV outbreaks over the last 10 years, the new response tactics will include implementing a minimum of five response rounds (each covering a minimum of 1 million people), expanding the target age group for the first two rounds (e.g. to less than 15 years of age or the entire population, depending on the epidemiology), and reducing the interval between the first three rounds (e.g. from 4-6 weeks to 2-3 weeks). Joint national and international rapid assessments will be conducted at three and six months following the index case to assess the quality of the outbreak response and plan course corrections.

5.46 Whereas outbreak response activities have historically been driven by isolation of a poliovirus from a paralysed child, during the eradication and endgame period environmental data will also be used more systematically to guide outbreak response planning and implementation. For endemic and other high-risk areas, the detection of a positive environmental sample will help to guide the geographic extent as well as the duration of a response. In previously polio-free areas, the detection of a positive environmental sample will trigger both a virologic and epidemiologic investigation to guide heightened surveillance and, if appropriate, an immunization response.

[18] *International travel and health* 2012. See http://www.who.int/ith/chapters/en/index.html.

5.5 Who oversees this work?

The Independent Monitoring Board

5.47 Independent oversight of polio-eradication activities is provided by the Independent Monitoring Board (IMB).

6. Objective 2: Immunization systems strengthening and OPV withdrawal

Immunization Systems Strengthening & OPV Withdrawal		
Main Objectives	**Outcome Indicators**	**Major Activities**
Strengthen immunization services in "focus countries", introduce IPV and withdraw OPV2 globally	**OPV type 2 withdrawn globally by end-2016** **At least 10% annual increase in DTP3 coverage achieved in 80% of high-risk districts of all focus countries from 2014 to 2018**	**1. Increasing immunization coverage** **2. Ensuring appropriate IPV, bOPV and mOPV products** **3. Introducing IPV**
Monitored by the SAGE		

6.1 Introduction

6.1 High immunization coverage has been an important strategy for the GPEI since its inception. For the polio endgame, however, high immunization coverage is essential to optimize the management of the immediate and long-term risks of poliovirus. In addition to facilitating the interruption of WPV transmission and reducing the risk of WPV importation and spread, high immunization coverage is the best strategy for reducing the risk of cVDPV emergence before, during and after the withdrawal of oral poliovirus vaccines.

6.2 In addition to reducing the immediate and long-term polio risks, this imperative establishes a significant opportunity for the GPEI to effectively help strengthen immunization systems. Most of the world's under-vaccinated children live in countries that either remain endemic for polio or have experienced multiple poliovirus importations and outbreaks. The GPEI has acquired extensive experience in reaching the most difficult-to-reach children in these countries, substantial GPEI human and material resources are currently deployed in the polio-endemic and high-risk countries, and there is strong interest within countries and among immunization partners, particularly the GAVI Alliance, to take concerted action with the GPEI to improve immunization systems in these countries. Exploiting such an apparent opportunity has to date proven quite difficult in many countries, particularly those with intensive SIA schedules.

6.3 A strong foundation exists for the GPEI to rapidly align with broader efforts to strengthen immunization systems. At a strategic level, polio eradication is a key objective under the GVAP, the framework approved by the World Health Assembly in May 2012 for

achieving the Decade of Vaccines vision by delivering universal access to immunization.[19] At an operational level, at least some activities supporting eradication have been part of immunization programmes in all countries, and polio-funded workers already contribute to broader immunization activities, albeit at widely varying levels across countries. This forms the basis for the GPEI's more focused and strategic alignment with the goals of the GVAP and the GAVI Alliance during the 2013-2018 period. Polio eradication and immunization managers will work together to realize programmatic synergies in support of national plans and strategies.

6.4 The importance of enhancing immunization coverage against polio is reflected in the fact that in 2012 more countries reported outbreaks caused by a cVDPV than a WPV. A number of countries with persistently low immunization coverage have experienced repeated cVDPV emergences, often resulting in prolonged outbreaks.

6.5 To minimize the immediate and long-term risks of polio, the essential elements of the polio endgame therefore include strengthening immunization coverage and changing the polio vaccines used in both routine and supplementary immunization activities. In May 2008, in line with guidance from the SAGE, the World Health Assembly endorsed the principle of synchronized OPV cessation globally. Recognizing that WPV2 was eradicated in 1999 and that more than 90% of the cVDPV cases in recent years were caused by the vaccine-derived type 2 strain, in 2012 the SAGE further recommended the withdrawal of OPV2 as the first step towards complete withdrawal of all oral polio vaccines. In November 2012, the SAGE recommended that all countries introduce at least one dose of IPV in their routine immunization programme to mitigate the risks associated with the withdrawal of OPV2.

6.2 The goal

6.6 Objective 2 aims to systematically use the GPEI infrastructure to more effectively strengthen immunization services, particularly in a set of "focus countries", thereby contributing to broader global immunization targets, facilitating the introduction and increased impact of IPV, and reducing the risks of cVDPV emergence before, during and after the withdrawal of OPV serotypes from immunization programmes globally. The key milestones on this objective's path include the achievement of at least a 10% year-on-year increase in diphtheria–tetanus–pertussis vaccine third dose (DTP3) coverage in the majority of worst-performing districts in focus countries from 2014, the introduction of at least one dose of IPV in all OPV-using countries in 2015 and the withdrawal of OPV2 globally in 2016.

6.3 What is required?

6.7 To introduce IPV and replace tOPV with bOPV (types 1 and 3) globally, the GPEI and immunization partners will assist the 145 countries that currently use tOPV in their immunization programmes, while giving particular attention to improving immunization

[19] Information on the Decade of Vaccines collaboration is available at http://www.who.int/immunization/newsroom/press/decade_of_vaccines_commitment_every_woman_child_october_2012/en/index.html.

coverage in a number of focus countries that harbour the greatest number of unimmunized children and where the risk of cVDPV emergence and persistence is often greatest. In focus countries, it is likely to require polio-funded and other immunization staff to work together to find new ways of collaborating and define how to join forces most efficiently in support of national plans.

6.4 What will be done?

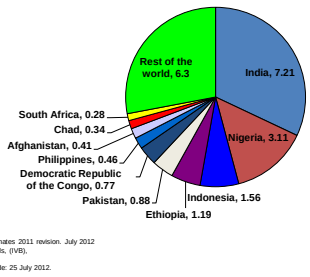
Major activities:
1. Increasing immunization coverage
2. Ensuring appropriate IPV, bOPV and mOPV products
3. Introducing IPV
4. Withdrawing OPV from routine and supplementary immunization activities

Activity 1: Increasing immunization coverage

6.8 Increasing immunization coverage will have several direct benefits for polio-eradication efforts, including minimizing the risk, rate and extent of polio outbreaks; helping to control polio transmission if there are delays in eradication in the remaining endemic areas; reducing the emergence of VDPVs; and, increasing the impact of IPV and bOPV following withdrawal of OPV2.

6.9 Geographically, the GPEI is best positioned to assist with immunization systems strengthening in those countries where it has deployed the most significant number of staff at the subnational level, as part of the intensified global eradication effort. Because persistent polio transmission has correlated closely with weak immunization services, these same countries contain most of the world's under-vaccinated children (Figure 14). The majority of these countries have already been identified as priorities for targeted support based on a low national level of immunization coverage (DTP3<70%) by GAVI, WHO and UNICEF. These focus countries for the GPEI's intensified attention to immunization systems strengthening include Afghanistan, Chad, the Democratic Republic of the Congo, Ethiopia, India, Nigeria, Pakistan, Somalia and South Sudan as well as Angola. Of these countries, all but Ethiopia, India and Angola are also identified under GAVI's policy for fragile states that allows for support more closely tailored to a country's situation.

Figure 14: Under-immunized or unimmunized children worldwide, 2011

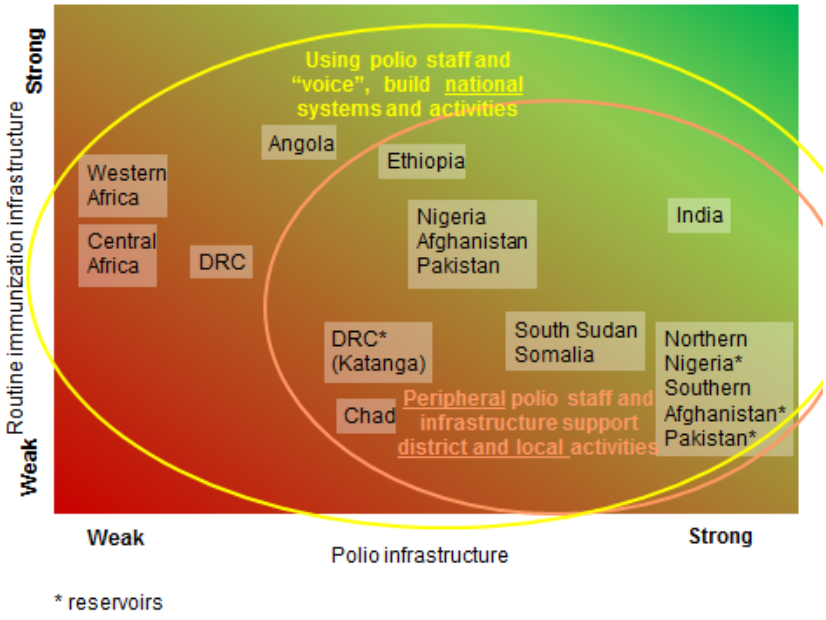


6.10 Immunization programmes in the focus countries face challenges in a number of specific areas where the GPEI can potentially provide support, including:

- programme management and accountability
- human resource capacity and supervision
- programme monitoring, vaccine-preventable disease surveillance and data use
- vaccine management, supply and cold chain
- communications, health education and social mobilization
- political support, funding and advocacy.

6.11 A coordinated approach will be developed between the GPEI, GAVI Alliance and other immunization partners to support national authorities in pursuing revitalized and focused immunization strategies to increase coverage in these countries (Figure 15). The goal in these focus countries is to contribute to at least a 10% year-on-year improvement in DTP3 coverage rates in the worst-performing high-risk districts for polio from 2014. The progress will be monitored through regular programme evaluations and rapid surveys to assess coverage.

Figure 15: Countries with weak routine immunization systems and strong GPEI presence



Source: WHO/UNICEF.

6.12 The first step in the focus countries will be for the GPEI, GAVI and other immunization partners to support the respective national authorities to develop annual integrated action plans for strengthening immunization services. Details will be elaborated and a workplan with milestones and deadlines finalized by the end of 2013. Within this framework, the GPEI staff activities in poor-performing districts will be specifically directed towards strengthening national and local capacity in the following four areas:

- **management**, including systematic use of accountability frameworks, enhanced data management, evidence-based planning, training and vaccine supply management;

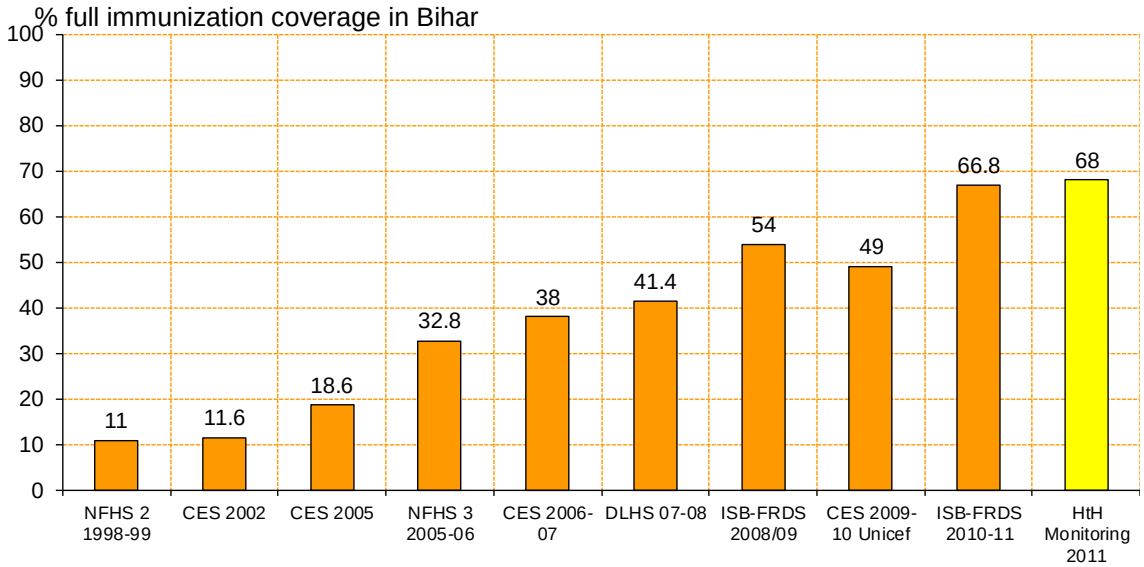
- **microplanning**, including population mapping, harmonization of routine immunization microplans with polio SIA microplans to enable more complete session planning, vaccine supply management and cold-chain logistics;

- **mobilization**, including top-level advocacy, engagement of local community leaders and household-level outreach. Social mobilization activities will be focused on generating demand for immunization, providing details on when and where immunization sessions are held, mobilizing caregivers to attend sessions, and addressing parent and caregiver concerns regarding the safety and utility of vaccines;

- **monitoring**, of immunization sessions, local community coverage and acceptance of vaccines, social mobilization efforts, availability of health workers, vaccine delivery and other immunization session logistics, and overall quality and impact of services. The application of real-time collection and analysis will generate local data for immediate corrective action and increased accountability.

6.13 The impact of such GPEI activities on immunization coverage rates, when combined with political commitment and the support of local authorities, is best illustrated by the experience in the state of Bihar, India (Figure 16), where during the period of the most intense polio-eradication activities, assessed coverage for fully immunized children increased from around 30% to nearly 70%. In the 41 most challenging, high-risk blocks (subdistrict unit) in which the polio programme resources were most focused, full immunization coverage rose even higher than the state average.

Figure 16: Immunization coverage in Bihar, India, 1998-2011



NFHS: National Family Health Survey
CES: Coverage Evaluation Survey
DLHS: District Level Household and Facility Survey
ISB-FRDS: Immunization Survey-Bihar, Formative Research and Development Service
HtH Monitoring: House to House Monitoring
Source: WHO

6.14 In Africa, the GPEI currently funds 90% of the over 1000 personnel associated with WHO regional offices for Africa's Immunization and Vaccine Development (IVD) effort. A full 53% of IVD staff time is already spent working on multiple diseases, while only 47% is spent on polio alone. Many of these IVD staff are now deeply involved in activities that directly support immunization systems, performing roles and activities that range from implementing the Reaching Every District (RED) strategy to providing supportive planning and contributing to the development of GAVI applications for health systems strengthening support.

6.15 GPEI contributions to the focus country initiatives to strengthen immunization systems will be supported and coordinated at the international level by the GPEI's spearheading partners (WHO, Rotary International, CDC and UNICEF) and the BMGF. Of these organizations, WHO, UNICEF, CDC and the BMGF all have dedicated staff supporting immunization systems strengthening at the country level, while Rotary International contributes to immunization as a key part of its PolioPlus Programme. The GAVI Secretariat will assist coordination with Alliance members, also reinforcing GPEI and GAVI support behind a unified effort at the country level. Increasing collaboration on immunization across these organizations, as well as with GAVI, is fundamental to the Plan.

6.16 In December 2012, the GAVI Alliance Board committed to working with the GPEI on immunization systems strengthening, stating that it "approved GAVI playing a complementary role to the GPEI in the polio-eradication effort, specifically through routine immunization within GAVI's strategy and mission using existing structures, processes and procedures". The GAVI Board also "approved GAVI exploring the suitability and possible use of IFFIm [Innovative Financing Facility for Immunization] as one potential financing mechanism, to support this activity within GAVI's strategy and mission using existing structures, processes and procedures"[20]. Following this decision, GPEI partners and GAVI initiated work to strengthen complementary approaches in their support for focus countries. This support will be reflected in national workplans that will be finalized in 2013.

6.17 To drive planning for increased GPEI support to immunization systems strengthening, the polio programme has identified key activities within each of the above-mentioned programme areas (Table 6) for further consolidated in 2013. To support these activities, the target is that by the end of 2014, at least 50% of polio-funded field personnel's time will be devoted to specific, measurable activities to help national authorities strengthen immunization systems and services.

Table 6: Select activities across key immunization focus areas

Focus area	Select activities
Management	• **GPEI field workers:** Updating of terms of reference for staff in polio-endemic countries to incorporate key measurable activities to support routine immunization strengthening; staff will support governments to monitor fixed and outreach immunization sessions, track vaccine supply/availability, support health-worker training, develop mechanisms to

[20] See GAVI Alliance Board Meeting 4-5 December 2012 Final Minutes. Available at http://www.gavialliance.org/library/minutes/searchtext/board%20decisions/.

	identify children not immunized through routine immunization while in households during supervisory visits and monitoring SIAs (especially newborns), and drive community demand for and engagement with routine immunization • **Performance improvement through supportive supervision and in-service training:** Improvement of the core competencies of district and subdistrict immunization managers and health workers • **Supply systems (in particular cold chain):** More regularly collected and tracked vaccine management data to identify supply issues (including stock-outs, wastage) and rapid corrective action; training rolled out where necessary to educate providers on proper handling, usage and disposal of vaccines and consumables
Microplanning	• **Harmonization of routine immunization microplans with polio microplans:** Local-level coordination on microplans to deliver greater detail on hard-to-reach populations and settlements for routine immunization outreach services • **New tools:** Expansion of the use of GIS and GPS tools to improve microplanning and monitoring for polio in Nigeria for use in routine immunization programmes • **RED approach:** Application of the best practices from the Reaching Every District (and Community) approach to local programme planning
Mobilization	• **Community engagement**: GPEI support of government partners/community organizations/non-governmental organizations (NGOs) to use existing polio channels and best practices to mobilize and engage communities for immunization • **Evidence-based social mobilization:** Social mobilization and communications tailored to local barriers to routine immunization, based on monitoring data obtained locally
Monitoring	• **Systematic monitoring:** Monitoring of immunization sessions, availability of immunization staff, logistics, vaccines and cold chain and rapid assessments of local community coverage and reasons for under-vaccination • **Performance indicators:** Rationalized, standardized and widely used by programme managers and development partners, to improve immunization programme performance • **New tools:** Developed and field-tested for improving the ability to verify immunization status and confirm coverage data • **Record quality:** Identification of mechanisms for increased retention and improved design of home-based and clinic immunization records

	• **Local and global data systems:** Developed with initial deployment of improved immunization information systems in focus countries • **Stronger focus on data quality:** Expertise shared in data quality and use, including home-based records, survey methodologies, and assisting countries with information system transitions • **VPD surveillance:** Assistance with further expansion of surveillance for vaccine-preventable diseases to monitor disease control and changing epidemiology and to guide programme actions

Activity 2: Ensuring appropriate IPV, bOPV and mOPV products

6.18 As progress towards WPV eradication accelerated in the late 1990s, a new risk to a polio-free world became apparent. In rare cases in areas with extensive immunity gaps, VDPVs were able to mutate to the extent that they acquired characteristics of WPV. These VDPVs – especially type 2 – are causing cVDPV outbreaks, which are associated with permanent paralysis, including bulbar polio, and death, similar to WPV outbreaks. More rarely, VDPVs have been shown to persist for years in some individuals with primary immunodeficiency syndromes.

6.19 By 2005, expert polio-eradication and immunization advisory bodies concluded that addressing these risks in a comprehensive manner and eliminating all paralytic polio disease would ultimately require stopping all use of OPV globally as part of the polio-eradication endgame.[21]

6.20 Currently 145 countries use tOPV to vaccinate children against polio in their routine immunization programmes. The tOPV contains the poliovirus type 1, 2 and 3 serotypes. The use of this vaccine led to the successfully eradication of WPV2 in 1999. At the end of 2012, 90% of cVDPV cases were being caused by viruses derived from the type 2 component of the OPV. In 2012, five polio outbreaks due to cVDPV type 2 were detected, in Afghanistan, Chad, the Democratic Republic of the Congo, Kenya, Nigeria, Pakistan and Somalia (the outbreaks in Nigeria and Somalia represent ongoing transmission for longer than 36 months). Given this and the long-term risks of VAPP and iVDPVs, the use of specific OPV serotypes will be phased out globally from all immunization activities and programmes, beginning with the withdrawal of OPV2 and the replacement of all tOPV with bOPV (types 1 and 3) in global routine immunization programmes by mid-2016.

6.21 To safeguard against the withdrawal of the type 2 serotype, in November 2012 the SAGE recommended that at least one dose of IPV be introduced into all routine immunization programmes prior to the switch from tOPV to bOPV. This IPV dose is expected to:

- prevent paralytic polio in individuals exposed to a cVDPV type 2 or WPV2;

[21] Resolution WHA61.1, "Poliomyelitis: mechanism for management of potential risks to eradication".

- improve the immunological response to mOPV type 2 if required to be given in response to a WPV2 or cVDPV2 outbreak after tOPV cessation;
- reduce transmission of cVDPV type 2 or WPV2 should either be introduced after tOPV cessation;
- boost immunity to WPV1 and WPV3 in vaccine recipients, which may further accelerate WPV eradication.

6.22 The introduction of IPV into all low- and low-middle-income OPV-using countries will require a combination of volume purchasing of existing IPV products – which could lead to an overall reduction in price-per-dose costs – and developing alternative low-cost IPV options that can potentially be priced at less than one dollar per dose. Two alternative, low-cost options currently under development for the near to medium term include:

- the licensing of intradermal fractional (one fifth) dose IPV;
- the development of new, adjuvanted and antigen-sparing intramuscular IPV products.[22]

6.23 Given that countries may have a preference for either the intradermal or the adjuvanted intramuscular IPV option and that insufficient evidence exists at this time to recommend one approach over the other, both options are being pursued. At the start of 2013, both options faced regulatory and/or development challenges. It may be possible to address these challenges in the near term (24 to 48 months) through active engagement with manufacturers and national regulatory authorities; with intensive support from the international community; through the development of a multi-dose policy for IPV; and with rapid mapping of regulatory pathways.

6.24 Recognizing that the development of new, low-cost IPV options may not meet the timeline for a "tOPV-bOPV switch", the GPEI is working with manufacturers and other stakeholders to develop a strategy by the end of 2013 to allow the introduction of IPV in low- and low-middle-income countries using existing products at substantially reduced prices, with a transition to lower-cost products as they become available. The GAVI Alliance will consider supporting IPV in eligible countries as part of its Vaccine Investment Strategy by the end of 2013. In addition, by 2018 options should be available to safely produce IPV in developing-country settings (e.g. Sabin-IPV) to ensure all countries have the opportunity to produce IPV for their immunization programmes.[23]

6.25 The recent availability (since 2009) and proven efficacy of bOPV against the remaining WPV1 and WPV3 serotypes are central to the OPV2 withdrawal strategy. A sufficient and secure international supply of this product for an eventual tOPV-bOPV switch will be available by early 2015 for countries procuring WHO prequalified OPV. Those countries that currently rely on national OPV production will need to develop and license a bOPV by the end of 2015. The GPEI will prioritize its work with manufacturers in these countries to ensure that all have sufficient access to bOPV in advance of OPV2 withdrawal.

[22] Resik S et al. in the Cuba study, *Journal of Infectious Diseases*, 2010, demonstrated that one fractional dose (one fifth or a full dose) after multiple OPV doses may be sufficient to establish immunity base (seroconversion and priming). See Resik S et al. Randomized controlled clinical trial of fractional doses of inactivated poliovirus vaccine administered intradermally by needle-free device in Cuba. *Journal of Infectious Diseases*, 2010, 201 (9):1344-1352.

[23] SAGE meeting, 10-12 April 2012: see http://www.who.int/immunization/sage_conclusions/en/index.html.

6.26 Following the tOPV-bOPV switch, bOPV will be the vaccine of choice for responding to all WPV1 or WPV3 outbreaks and mOPV type 2 will be the vaccine of choice for responding to any cVDPV type 2 outbreak or a WPV2 release from a laboratory or production facility. A stockpile of 500 million doses of mOPV type 2 as bulk will be available by the end of 2015 for this purpose. After the tOPV-bOPV switch, the GPEI will ensure rapid access to stand-alone IPV (up to 10 million doses) for countries and areas contiguous with, but outside the area of, an outbreak to rapidly reinforce population immunity. Ideally, this can be achieved through the careful management of the global IPV buffer stock. The detection of an ambiguous vaccine-derived poliovirus (aVDPV) type 2 may trigger a pre-emptive IPV response in the immediate area.[24]

6.27 Following bOPV cessation (by the target date of 2019), a combination of mOPVs and IPV will be used to respond to any WPV or VDPV outbreak, regardless of serotype. An international stockpile of 300 million doses of both mOPV type 1 and mOPV type 3 will be established by the end of 2017 for this purpose.

Activity 3: Introducing IPV

6.28 To boost population immunity against type 2 polioviruses prior to OPV2 cessation and to maintain a polio type 2-primed/protected population thereafter, the SAGE recommended in November 2012 that all countries introduce at least one dose of IPV into their routine immunization programmes. As summarized above, this will help maintain population immunity against type 2 polioviruses, improve the response to mOPV type 2 or an additional dose of IPV in a type 2 polio outbreak, reduce the transmission of a reintroduced type 2 poliovirus and thereby substantially reduce the consequences of a subsequent circulating poliovirus – in terms of paralytic disease – and facilitate the containment of outbreaks. [25] Evidence demonstrates that this could also accelerate WPV eradication by boosting immunity to WPV1 and WPV3. For countries at particular risk of cVDPV emergence, this approach may need to be complemented with additional measures, such as pre-cessation tOPV campaigns to boost immunity or the introduction of two routine IPV doses. Recognizing that the risks associated with eventual bOPV cessation may be similar to those associated with OPV2 cessation, it is recommended that countries plan to continue administering at least one dose of IPV in their immunization programmes for at least five years after bOPV cessation.

6.29 Lessons learnt in the introduction of new vaccines in low- and middle-income countries over the past decade (e.g. of *Haemophilus influenzae* type b, pneumococcal or rotavirus vaccines) will be beneficial to IPV introduction. Countries will need to perform proper planning and preparation building upon existing checklists for cold-chain, logistics and

[24] aVDPVs are vaccine-derived polioviruses that are either isolated from people with no known immunodeficiency, or isolated from sewage whose ultimate source is unknown.

[25] Sutter RW, Kew OM, Cochi SL, Aylward RB. Poliovirus Vaccine–Live. In: Plotkin SA, Orenstein WA, eds. *Vaccines*, 6th ed. Philadelphia, PA, W.B. Saunders Company, 2012 (in press); Alexander LN et al. Vaccine policy changes and epidemiology of poliomyelitis in the United States. *Journal of the American Medical Association*, 2004, 292 (14):1696-1701; Estívariz CF et al. Paralytic poliomyelitis associated with Sabin monovalent and bivalent oral polio vaccines in Hungary. *American Journal of Epidemiology*, 2011, 174 (3):316-325. Epub 2011 Jun 17.

vaccine management, health-care worker training and supervision, waste management, injection safety and adverse events following immunization (AEFI) monitoring. GPEI partners, particularly WHO and UNICEF, in conjunction with the GAVI Alliance and other immunization partners, will help countries prepare for the introduction of IPV. Relevant support activities will include the training of health workers, communications development, cold-chain management and the development of vaccine management strategies.

6.30 The introduction of IPV in routine immunization will require intensive outreach to caregivers and providers. Communications strategies will depend on the nature of the OPV phase-out and IPV introduction and will be determined based on the acceptance of immunization, the presence of political opposition or anti-vaccine lobbies, and the operational approaches to including IPV in the schedule while OPV is still being offered. A clear rationale for OPV and IPV administration will be provided to the media, medical institutions and religious, traditional and political leaders. Public communication to caregivers will focus on the success of polio eradication, which opens the door for the provision of new vaccines such as IPV to complete the existing polio programme. Advocacy among technical experts for public support and endorsement of IPV and OPV will be critical in this area.

6.31 Given the geographic scope of this vaccine shift, social research will be undertaken in all priority countries to determine acceptability of IPV and, as necessary, develop tailored messages for specific audiences. This work will inform the preparation of nuanced communications that can be delivered prior to the vaccine introduction (at least six months in advance) to help prepare caregivers and providers for the change. Social mobilizer networks, trained health workers and credible community and religious leaders will be relied upon to deliver or endorse messages to caregivers and providers at the local level. If necessary, these messages will be supported through the mass promotion of IPV and routine immunization in print, radio, television and new media.

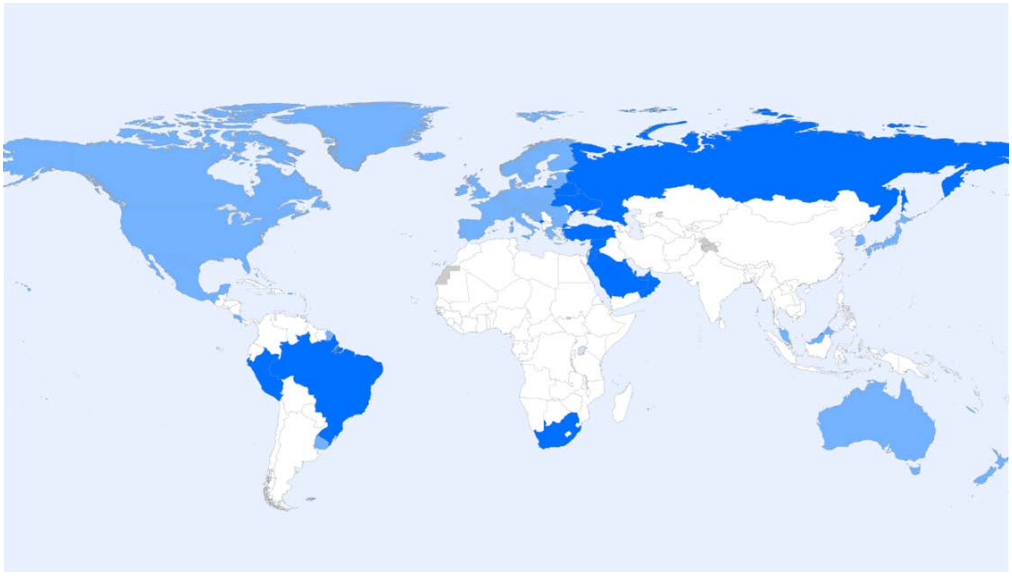
Activity 4: Withdrawing OPV from routine and supplementary immunization activities

6.32 Prior to the withdrawal of OPV2 – by replacing tOPV with bOPV in all OPV-using countries, six prerequisites must be in place:

1. validation of the elimination of persistent cVDPV type 2 and confirmation of WPV2 eradication;
2. an mOPV type 2 stockpile and response capacity;
3. surveillance capacity and an international notification requirement for all Sabin, Sabin-like and cVDPV type 2 viruses;
4. sufficient bOPV products for all OPV-using countries;
5. affordable IPV option(s) for all OPV-using countries;
6. phase II biocontainment of all cVDPVs type 2 and WPVs.

6.33 In addition to these prerequisites, achieving the global withdrawal of OPV2 will require meeting a combination of logistical, communications, vaccine-supply and programmatic challenges. Substantial logistical challenges must be addressed to synchronously switch all 145 OPV-using countries (Figure 17) from tOPV to bOPV, withdraw the tOPV field stocks, and safely destroy or contain residual type 2 Sabin vaccine viruses.

Figure 17: Countries using oral polio vaccine, April 2013



6.34 With these challenges in mind, four basic principles will guide the withdrawal of OPV2:

- the complete cessation of use of all tOPV globally must occur by a fixed date;
- cessation should be coordinated across all countries using tOPV;
- all remaining stocks of tOPV at the time of cessation must be collected and destroyed;
- the process must be documented.

In practice this means that an indicative target date should be established internationally three years in advance of type 2 cessation, with a firm date established at least 12 months in advance of the switch to bOPV and cessation of tOPV use. This will enable vaccine manufacturers, suppliers and national health authorities to plan appropriately. National plans must include:

- logistics plans detailing the quantities of bOPV required for the replacement of tOPV, transport and storage requirements for the withdrawal of the remaining stocks of tOPV, and the designation of secure collection points during the withdrawal phase;
- training and communications plans for health workers to ensure they understand the reasons for and process of the switch, and can communicate these effectively to the communities they serve;
- training, logistics and communications plans for the introduction of a dose of IPV into routine immunization schedules (see above).

Key elements of stopping tOPV use and withdrawing the remaining stocks will ideally include:

- ensuring that the last shipments of tOPV to the national and subnational levels are closely managed during six months, before the agreed target date for cessation;
- conducting national stocktakes of vaccine at all levels six months as well as one to two months prior to cessation and one month after cessation;
- designating secure collection points for tOPV, which will accept vaccine from one month prior to one month after cessation of use.

Following the transition from tOPV to bOPV, all remaining stocks of tOPV must be destroyed or securely stored at the national level, within three months. Documentation of the process of tOPV's withdrawal from use and the collection and destruction of remaining stocks will be critical for National Certification Committees and the Regional and Global Certification Commissions. As this will be the first global withdrawal of an OPV serotype, it will be essential to constantly evaluate the process to validate assumptions and document best practice for eventual bOPV withdrawal.

6.35 A comprehensive communications strategy for caregivers and parents whose children will receive the new vaccine schedule and training of the health workers who will implement it will accompany this logistical work. IPV introduction has been successful in all countries that have made the switch, often with little or no public outreach regarding the change. Research on the social acceptance of IPV from western Uttar Pradesh and Bihar, India suggests that IPV will be accepted if communities are clearly informed of the reason for the transition and receive assurances of IPV safety and effectiveness. However, the reaction to IPV introduction coupled with a switch to bOPV requires more social research, especially in communities where trust in OPV or immunization is generally weak. A clear rationale for OPV and IPV administration will be provided to caregivers, and the switch will be communicated as an improvement and acceleration of the existing polio programme and not as a move to resolve any type of vaccine failure. Communications efforts will engage social mobilizer networks, credible community and religious leaders, and mass promotion in print, radio, television and new media.

6.36 Following the global certification of total WPV serotype eradication, bOPV will be withdrawn from routine use worldwide, ensuring the elimination of all polioviruses. As with the withdrawal of tOPV, substantial logistical challenges will need to be addressed to synchronously stop routine bOPV use, withdraw remaining OPV field stocks and safely destroy or contain the residual Sabin strain viruses. The experience gained during the withdrawal of tOPV will be of tremendous use during this final step in the removal of all oral poliovirus vaccines.

6.5 Who oversees this work?

The Strategic Advisory Group of Experts on Immunization

6.37 Activities under Objective 2 are overseen by the Strategic Advisory Group of Experts on Immunization (SAGE).

7. Objective 3: Containment and certification

Containment & Certification		
Main Objectives	**Outcome Indicators**	**Major Activities**
Certify the eradication and containment of all wild polioviruses by end-2018 and enhance long-term global security from poliomyelitis	**Global polio eradication certified by end-2018**	**1. Containing poliovirus stocks** **2. Certifying the eradication of WPVs**
Monitored by the GCC		

7.1 Introduction

7.1 Following interruption of WPV transmission globally, the safe handling and containment of WPV infectious and potential infectious materials in laboratory and vaccine production facilities will be essential to minimize the risk of reintroducing WPV into the population. A reintroduction of WPV from a poliovirus facility would risk the potentially serious consequences of re-establishing poliomyelitis. After the cessation of OPV use globally, the reintroduction of an OPV/Sabin virus strain from a poliovirus facility would risk the emergence of a cVDPV, and again the potentially serious consequences of re-establishing poliomyelitis. Most facility-associated poliovirus risks can be eliminated through the destruction of WPV and OPV/Sabin infectious and potentially infectious materials. However, poliovirus facilities will be necessary in a number of countries to continue essential international functions, including IPV production, OPV stockpile management, vaccine quality assurance, diagnostic reagent production, virus reference functions and research. Minimizing the number of essential facilities worldwide reduces the risk of reintroduction, facilitates national and international oversight, and ensures that global containment standards can be met.

7.2 The primary requirements for certifying a WHO region as free of WPV are:

- the absence of any WPV for a minimum of three years in all countries of the region;
- the presence of certification-standard surveillance in all countries during that three-year period;[26]
- the completion of Phase I biocontainment activities for all facility-based WPV stocks.

Certification at the regional level is assured by independent Regional Certification Commissions (RCCs) that report in turn to the Global Certification Commission (GCC). RCCs are supported by independent National Certification Committees (NCCs) that assess, verify and present the required national documentation on polio-free status to the RCC. Members of RCCs and NCCs are independent leading experts in relevant disciplines (public

[26] See footnote 16 for the definition of certification-standard performance.

health, epidemiology, virology), acting in their personal capacity, without direct responsibility for polio eradication in their country or region.

7.2 The goal

7.3 The goal of Objective 3 is to certify the eradication and containment of all WPVs by the end of 2018 to enhance long-term global security from poliomyelitis.

7.3 What is required?

7.4 The global certification of WPV eradication – and verification of the elimination of vaccine-related viruses – will require ensuring highly sensitive poliovirus surveillance and full application of relevant poliovirus biocontainment requirements globally. Chronic gaps in surveillance sensitivity will need to be addressed in both recently infected countries and countries that have long been certified as polio-free, overcoming complacency, weak health systems, geography, insecurity and other challenges to identifying and investigating paralysed children. International consensus will need to be established on the timelines and phasing for implementation of biocontainment requirements for the safe handling of residual polioviruses (e.g. for vaccine production, research and diagnostic facilities); the necessary inventorying, destruction and containment activities will then need to be implemented and verified in all countries. In addition, international consensus will be required on the criteria and processes for reintroducing live poliovirus vaccines to respond to any reintroduced or emergent polioviruses after OPV cessation.

7.4 What is the current situation?

7.5 The first Global Action Plan (GAP) for containment of WPV was developed in 1999 with the recognition that containment needed to be addressed in advance of eradication certification. Implementation of the first GAP identified the national laboratory survey and inventory as an essential first-step towards containment. These activities were started in 2000 in the WHO Western Pacific Region and subsequently expanded to other regions. Following the outbreak of cVDPV in Hispaniola (2000-2001), the GAP was updated to include containment of VDPV in addition to WPV (GAPII). National survey and inventory activities were completed in all countries of the WHO Western Pacific, European and American Regions by 2008.

7.6 The renewed discussions on OPV cessation that were prompted by the confirmation of cVDPVs in turn prompted the development of a third edition of the GAP. The Global Action Plan to minimize post-eradication poliovirus facility-associated risks (GAPIII) outlines relevant biosafety levels and safeguards for handling wild, Sabin and Sabin-derived polioviruses following eradication and eventual OPV cessation.

7.7 Containment activities have commenced in all six WHO regions. In the WHO Region of the Americas, European Region and Western Pacific Region, all Member States have completed the Phase I containment survey and inventories for WPV materials. In the three WHO regions that are not yet certified (African, Eastern Mediterranean and South-East Asia Regions), 40 Member States have completed Phase I containment activities. In total, 155 of

194 (80%) WHO Member States have collectively surveyed more than 200 000 biomedical facilities (some of which are large institutions with multiple laboratories) to identify those with WPV infectious or potentially infectious materials. To date, approximately 550 facilities with WPV infectious or potentially infectious materials have been identified in 46 countries. This includes six facilities for producing Salk Inactivated Polio Vaccine (IPV). The majority of the remaining 39 Member States to complete Phase I are located in south-east Asia and sub-Saharan Africa; the latter is thought unlikely to possess a substantial number of facilities with WPV materials due to infrastructure challenges. Nevertheless, it is planned that these countries will complete the Phase I work in the near future.

7.8 RCCs have accepted final documentation for polio-free status from 86% of Member States (167 of 194). This includes all Member States of the already certified WHO Region of the Americas (Pan American Health Organization), European Region and Western Pacific Region. The majority of the remaining countries that have not yet submitted final documentation are in Africa; in the WHO South-East Asia Region, only India remains and in the Eastern Mediterranean Region, only Afghanistan and Pakistan remain, for which the RCC has not yet accepted final documentation. The certification of the South-East Asian Region is anticipated by mid- to end-2014. If Afghanistan, Nigeria and Pakistan interrupt all WPV transmission by the end of 2014 as targeted, the remaining WHO African Region and the Eastern Mediterranean Region could potentially be certified by the end of 2017, with global certification occurring as early as the following year.

7.5 What will be done?

Major activities:
1. Containing poliovirus stocks
2. Certifying the eradication of WPVs

Activity 1: Containing poliovirus stocks

7.9 A revision of GAPIII is required based on two updates to the strategic path forward: the OPV2 cessation timeline and the requirement for global access to IPV. The timelines and phasing of activities in GAPIII will be finalized to align appropriately with the risks and timelines of these aspects of the programme. The process for addressing these issues will begin with the development of a revised timeline, followed by broad public consultation and specific consultation with vaccine manufacturers. The final step in the process of developing a post-eradication containment policy will be its adoption by the World Health Assembly as part of the comprehensive post-eradication endgame strategy. International agreement on the timing and implementation of the plan will ideally be established by the end of 2014, potentially with a World Health Assembly resolution to that effect in 2015.

7.10 The first stage of biocontainment is to complete laboratory survey and inventory activities in all polio-free countries and prepare for the implementation of containment activities prior to global certification. These activities have largely been completed globally with the exception of the persistent polio-infected countries and those that have suffered recurrent reinfections. Following confirmation that WPV transmission has been interrupted for one year, appropriate legislation and regulation will need to be initiated in all countries in preparation for the completion of all WPV containment within six months. At the time of the

tOPV-bOPV switch, safe-handling requirements will be increased for all Sabin type 2 polioviruses in advance of their full containment.

7.11 Countries retaining WPVs for the purposes of Salk-IPV production and/or essential quality assurance/quality control, laboratory or research functions may constitute the greatest residual WPV risks. At the end of 2012, five countries had active Salk-IPV production sites: Belgium, Denmark, France, the Netherlands and Sweden. The number and location of countries that retain WPVs for necessary quality assurance/quality control, laboratory and research functions will be finalized with completion of Phase 1 biocontainment activities globally (i.e. inventory and destruction of viruses and infectious materials). These areas will require full application of the *primary*, *secondary* and *tertiary* biocontainment safeguards outlined in GAPIII to minimize the risk of inadvertent or intentional WPV reintroduction. These safeguards are good facility design and management (primary safeguards), the location of essential facilities in areas with high levels of immunity (secondary safeguards) and location in areas with good personal, domestic and environmental hygiene standards (tertiary safeguards). Essential facilities using or retaining WPV materials after eradication will be expected to meet all p*rimary*, *secondary* and *tertiary* safeguards, while those retaining only OPV materials after cessation of OPV in routine immunization will be expected to meet *primary* and *secondary* safeguards. The safeguards will need to be in place for WPV2 by 2015; those for WPV1 and WPV3 will need to be in place by 2018.

Activity 2: Certifying the eradication of WPVs

7.12 A fourth WHO Region – South-East Asia – could potentially be certified polio-free in 2014, contingent on the timely submission of full documentation by all relevant NCCs and their acceptance by the South-East Asia Region RCC.

7.13 At its meeting in mid-2012, the GCC noted that prior to OPV2 cessation it will have to formally "conclude" that WPV2 has been eradicated globally. As a first step, RCCs from all WHO regions would need to provide the GCC with evidence towards this conclusion, based on the absence of WPV2 for more than 10 years and on regional surveillance quality. The GCC could consider this evidence as early as mid-2014, provided that an appropriate complement of GCC members has been established and that fully functional RCCs exist in all six WHO regions.

7.14 In advance of the global certification of all WPV eradication, the GCC will need to finalize data requirements from the three certified polio-free regions, clarify the role of environmental surveillance as a supplemental surveillance strategy, and establish mechanisms for reviewing and verifying documentation on the containment of laboratory stocks and IPV introduction.

7.15 For the three WHO regions that have been certified polio-free – the Region of the Americas and the European and Western Pacific Regions – the immediate priority will be to again achieve and maintain certification-standard performance in all areas with an AFP surveillance policy by 2015 to ensure the capacity to detect and respond to any cVDPV emergence following the planned tOPV-bOPV switch. This will be achieved by the ongoing work of RCCs and NCCs to monitor the polio-free status of countries in these regions, mobilizing increased support and political commitment to the global goals of the polio

endgame, allocating additional resources where needed – including for laboratory capacity – and providing WHO regional office support to countries for revitalizing their AFP surveillance.

7.16 For the three WHO regions yet to be certified polio-free (as of the end of 2012), the priority will be to close remaining gaps in AFP surveillance by 2014 (particularly in northern Nigeria, in West, Central and the Horn of Africa, and in Pakistan and Afghanistan) in advance of a global tOPV-bOPV switch. Particular attention will be given to ensuring that active surveillance is conducted and documented at least monthly at all major reporting sites, expanding networks of community informants and, potentially, establishing rewards for polio-confirmed AFP cases. As in the certified regions, RCCs and NCCs are expected to play an important role in sustaining certification-standard AFP surveillance performance at the national and subnational levels.

7.6 Who oversees this work?

The Global Commission for Certification and Regional Certification Commissions

7.17 The GCC oversees the overall process of certification. RCCs provide the GCC with documentation of certification activities under their oversight.

8. Objective 4: Legacy planning

Legacy Planning		
Main Objectives	**Outcome Indicators**	**Major Activities**
Develop a plan to ensure polio investments contribute to future health goals, through documentation and transition of lessons learnt, processes and assets of the Global Polio Eradication Initiative	**All wild poliovirus transmission stopped by end-2014** **All new cVDPV outbreaks stopped within 120 days**	**1. Mainstreaming polio functions** **2. Leveraging the knowledge and lessons learnt** **3. Transitioning the assets and infrastructure**
Monitored by the World Health Assembly		

8.1 Introduction

8.1 Achieving the first three objectives of the *Polio Eradication & Endgame Strategic Plan 2013-2018* will lead to the completion and closure of the GPEI. As the initiative enters its final stages, in collaboration with the global health community the GPEI will plan to ensure that investments made in the cause of polio eradication are built on to benefit other development goals.

8.2 The goal

8.2 Objective 4 aims to ensure that the investments made to eradicate poliomyelitis contribute to future health goals, through a work programme that systematically documents and transitions the GPEI's knowledge, lessons learnt and assets. A key milestone for this objective will be the establishment of a comprehensive polio legacy plan by no later than the end of 2015.

8.3 What is required?

8.3 The three principal aspects of the polio legacy work are:

- mainstreaming essential long-term polio immunization, surveillance, communication, response and containment functions into other ongoing public health programmes to protect a polio-free world;
- ensuring that the knowledge generated and lessons learnt during more than 20 years of polio-eradication activities are shared with other health initiatives;
- where feasible, desirable and appropriate, transitioning the capacities, processes and assets that the GPEI has created to support other health priorities.

8.4 What is the current situation?

8.4 During 25 years of operations, the GPEI has mobilized and trained millions of volunteers, social mobilizers and health workers. It has reached into households untouched by other health initiatives, mapped and brought health interventions to chronically neglected

communities and established a standardized, real-time global surveillance and response capacity. While all of these activities have been carried out primarily for the purpose of polio eradication, they have simultaneously benefited other health work, principally through the GPEI's surveillance and response capability for other vaccine-preventable diseases and the delivery of basic health services by polio vaccination teams.

8.5 One major achievement stands out: over the past 25 years the GPEI has accessed the chronically unreached, marginalized and most vulnerable populations in the world. In doing so, valuable lessons have been learnt and the polio programme has developed the knowledge, capacities and systems to overcome the logistic, geographic, social, political, cultural, ethnic, gender, financial and other barriers to working with the most marginalized, deprived and often security-compromised children and communities. This has provided the opportunity for polio workers to deliver and support a range of additional basic health services, including anthelminthics, vitamin A supplements, measles mortality-reduction activities, bednets and routine immunization. Key elements of the GPEI that allowed it to reach chronically missed children include the programme's detailed microplanning and mapping, the tracking of mobile and migrant groups, social mobilization programmes, and systematic training and deployment of vaccination teams.

8.6 The GPEI's far-reaching access has delivered a global surveillance capacity for vaccine-preventable diseases and a response capacity for both health and humanitarian emergencies in some of the world's most demanding settings. Through its integrated AFP surveillance and laboratory capability, the GPEI receives regular and credible reporting on any instance of AFP and is able to respond appropriately. This unprecedented surveillance capability originated from the need to identify, notify and investigate many tens of thousands of AFP cases worldwide every year. It has facilitated surveillance and response for other diseases including measles, tetanus, meningitis, yellow fever and other VPDs, and assisted in the global response to both public-health and humanitarian emergencies such as the severe acute respiratory syndrome outbreak, the Pakistan floods of 2010-2011 and the South-East Asian tsunami of 2004.

8.7 The sharing of GPEI assets and lessons with other global health initiatives is an essential element of the polio legacy. It should include the GPEI's experience in strengthening immunization systems (including modifying polio-eradication tools and innovations to benefit immunization systems), establishing best practices in data management, community engagement and mapping, and building a motivated and trained health workforce for the global public good. The polio workforce already contributes to this work and will continue to do so throughout the endgame Plan. Closer linkages between measles and rubella programme activities and the GPEI have recognized benefits for both programmes. The SAGE, the IMB and donors have all recommended that countries and global immunization partners assess the potential synergies and take active steps to transition the polio infrastructure and lessons learnt to support other health priorities, such as the achievement of measles and rubella elimination targets and the strengthening of immunization systems.

8.5 What will be done?

Major activities:

1. Mainstreaming polio functions
2. Leveraging the knowledge and lessons learnt

3. Transitioning the assets and infrastructure

Activity 1: Mainstreaming polio functions

8.8 Countries and organizations involved in polio eradication will need to plan the integration of activities undertaken for polio eradication into their ongoing functional structures and to transition staff, as needed. This mainstreaming of technical operations will be an essential part of securing the legacy of polio. It covers a number of categories:

- ensuring the continued integration of polio immunization (utilizing IPV) and communications activities into national and international immunization programmes;
- fully integrating polio surveillance and response activities into national and global disease alert and response mechanisms;
- ensuring the appropriate containment of polioviruses according to agreed international and national standards, regulations and protocols in countries that maintain poliovirus stocks.

Activity 2: Leveraging the knowledge and lessons learnt

8.9 Through its more than 20 years of operation, the GPEI has developed a set of lessons or best practices that are of potential benefit to other health programmes and priorities. By examining its areas of operation at both the national and international levels, it should be possible to identify key lessons that may be relevant to the broader health community. This exercise will include an examination of the following indicative areas:

- strategic planning and policy development;
- partnership management and donor coordination;
- programme operations and tactics;
- oversight and monitoring.

This process will be undertaken by the GPEI's spearheading partners in consultation with national governments and other key stakeholders and will focus on the GPEI's knowledge rather than its tangible assets.

Activity 3: Transitioning the assets and infrastructure

8.10 To outline the tangible assets that have been created through the polio-eradication initiative, to establish the activities and contributions that polio-funded staff are conducting and making beyond polio-eradication efforts, and to look at what capacities could be at risk with the eventual closure of the polio-eradication programme, it is necessary to first comprehensively map the polio assets. This exercise will begin in 2013.

8.11 The consultative process is another major element of planning for the post-polio era. The purpose of the consultative process is threefold. First, to tell the polio story to a broader community that understands what polio eradication is but may not grasp the full extent of the programme's potential to benefit other health initiatives. This exercise will feed into the second purpose, which is to have broad stakeholder consultation on how the assets created through the global polio-eradication efforts could be used beyond polio. It is not a proscriptive exercise but is rather intended to stimulate discussion around the potential benefits of these assets to other programmes and initiatives. The third purpose of the process

is to consult with national governments on how polio assets could benefit their health priorities (e.g. strengthening immunization systems, disease surveillance and measles control). These consultations will take place in 2013 and 2014. This consultative stage will examine how polio assets and lessons learnt could contribute to other health priorities, including immunization and surveillance for other vaccine-preventable diseases.

8.12 An important element of the consultative process will be to examine funding and management issues relevant to transitioning GPEI assets and lessons learnt, including consultation with global donors, national governments, WHO governing bodies and GPEI partner agency leadership. The consultative process on the wider use of GPEI assets and infrastructure will address issues related to the management of the tangible assets, the transfer and/or integration of staff into other programmes and the funding of human resources and/or other assets with wider applicability to vaccine-preventable diseases and other health priorities.

8.6 Who oversees this work?

The World Health Assembly

8.13 The initial stages of the legacy planning process will be overseen by the governing bodies of WHO, making decisions on oversight and management as that plan develops.

9. Risks, risk mitigation and contingency planning

9.1 The *Polio Eradication & Endgame Strategic Plan 2013-2018* has been designed to achieve polio eradication taking into account the specific challenges of each of the four major objectives. Unexpected factors and external risks can delay or undermine the GPEI's ability to achieve the Plan's objectives. Recognizing risks, identifying mitigation options and articulating contingency plans enhance the GPEI's ability to rapidly react to problems.

9.2 Six major forward-looking risks have been identified under two headings:

Input risks

1. Insufficient funding
2. Inability to recruit and retain the right people
3. Insufficient supply of appropriate vaccines

Implementation risks

4. Inability to operate in areas of insecurity
5. Decline in political and/or social will
6. Lack of accountability for quality activities

9.1 Insufficient funding

9.3 Risks: All activities in this Plan must be funded, sufficiently in advance to allow implementation as scheduled and at a high standard. As outlined in Section 10.3, the GPEI projects a financial requirement of US$ 5.5 billion for the 2013-2018 period.[27] The larger the gap in financing, the more planned activities would need to be cut and the higher the risks of failure to complete eradication.

9.4 Risk-mitigation activities: To secure full funding, donors must have confidence that the GPEI will deliver and that the benefits of a polio-free world are worth the investment. Donor input has been incorporated into the GPEI strategy on an ongoing basis. In addition to traditional funders, innovative finance mechanisms and alternative sources of funding – including new donors – are being explored as part of the ongoing resource mobilization effort. Emphasis is being placed on upfront long-term commitments to provide greater certainty on the likelihood of full GPEI funding. Over time, if funding gaps appear, new opportunities for fundraising from traditional and non-traditional donors and other sources will be explored.

9.5 Multiple options are currently being developed to ensure a robust cross-agency resource mobilization effort following the Global Vaccine Summit[28] in Abu Dhabi in April 2013, to help operationalize funding commitments and fill any funding gaps. By mid-June, 2013, new resource mobilization structures are expected to be in place to guide and drive the post-Vaccine Summit fundraising effort.

[27] See section on financial resources and management.
[28] See http://globalvaccinesummit.org/.

9.6 Of equal importance is the careful stewardship of raised funds, active cost management and continued transparency with donors. Continuous improvement related to the GPEI's operations will be critical, particularly as vaccine and vaccination approaches evolve between 2013 and 2018. The GPEI will also maintain an increased level of transparency with key constituents – including donors – on the sources and uses of funds and how to manage deviations in either.

9.7 Contingencies: Without the necessary donor confidence and funding, the programme will not reach eradication in the planned timeframe and its focus and activities will necessarily be narrowed in relation to the size of the funding gap. If extreme, this restriction could occasion the paring back of activities, according to a predetermined GPEI priority scheme. This mandates the list of top five priorities that the GPEI strives most to protect: core staff, the Surveillance and Laboratory Network, endemic country SIAs, outbreak response and high-risk/other country SIAs. All other programme aspects would risk being cut.

9.2 Inability to recruit and retain the right people

9.8 Risk: Individuals with technical expertise, management skills and the ability to navigate the local, social and political dynamics are necessary for eradication completion. Quality will suffer without these individuals. Talent shortages have already been experienced. In addition, as the end-2014 projected date for WPV interruption approaches, the risk of turnover increases, as individuals seek alternative opportunities, assuming polio activities will be wound down, as does the risk of perverse incentives for the polio workforce not to complete eradication.

9.9 Risk-mitigation activities: First, the GPEI will systematically evaluate the consultants and the Stop Transmission Of Polio (STOP) team[29] resources and focus on retaining the highest performers. Second, the programme will recruit with a long-term mindset, reminding current and potential staff that they have an opportunity to secure longer-term employment, particularly under future legacy arrangements. Third, the GPEI will undertake a new recruitment drive to establish a global roster for key skill sets.

9.10 Contingencies: In very limited cases, the GPEI will consider more extreme measures to get the right people in the right places. These measures will include increased compensation and/or incentives to get the most talented staff to work in challenging geographies. Similarly, international staff could be reallocated to difficult areas. In addition, outsourcing will be considered.

9.3 Insufficient supply of appropriate vaccines

9.11 Risk: Owing to a variety of factors that include the need to respond rapidly to changing epidemiology, periodic vaccine supply shortages have been experienced, threatening and, in

[29] STOP participants are skilled, short-term consultants who provide field support to polio immunization programmes.

some cases, causing programmatic disruptions. In 2012, unanticipated cVDPV type 2 outbreaks in Somalia, Kenya and Chad required unexpected (and urgent) demand for tOPV. Additionally, the delisting of WHO prequalified bOPV and tOPV products from two major OPV suppliers contributed to an overall global shortage of OPV in 2012.

9.12 Risk-mitigation activities: For the tOPV-bOPV switch, the GPEI will bring in new suppliers, continue to support the possible re-entry of delisted products and maintain production (avoiding shutdowns) to ensure sufficient supply. To incentivize reliable production and supply, the programme will offer longer-term production contracts through 2016 and prioritize support to national manufacturers to ensure all countries have access to bOPV in advance of OPV2 withdrawal.

9.13 For the introduction of IPV, in addition to volume purchasing of existing IPV products, the GPEI is pursuing the development of two low-cost IPV options: adjuvanted intramuscular IPV and intradermal fractional dose IPV. The GPEI will also work closely with manufacturers and regulatory authorities to establish the basis for regulatory approval and licensure. Similar to OPV supply, the GPEI will seek to incentivize production through longer-term contracts.

9.14 Contingencies: Without sufficient vaccine supply, eradication will likely not meet the planned timelines. Assuming insufficient supply, vaccine delivery priorities will be based on the prevailing epidemiology. In the near term, this would mean a focus on the endemic countries and interrupting transmission. An IPV supply shortage could be managed by subsidizing whole dose IPV until low dose becomes available.

9.4 Inability to operate in areas of insecurity

9.15 Risk: For many years, the polio-eradication programme has operated successfully in countries with challenging security environments. However, threats to security increased significantly in 2012, as was forcibly demonstrated by the assassinations of polio-eradication health workers in Pakistan in December. In 2013-2014 in all three remaining endemic countries, complex security issues that the programme cannot control may delay expected progress in the areas of persistent transmission. In northern Nigeria these include the killings of polio workers and the increased threat of kidnapping of international staff in addition to the ramifications of ongoing conflict (although the situation appears to be improving as the government has experienced success in dealing with militants, resulting in fewer and less damaging attacks). The security threats in Pakistan involve the killings of polio workers and the Pakistan Taliban's vaccination ban in North and South Waziristan. In Afghanistan, the potential for increased instability is due to the eventual withdrawal of coalition forces. Pending elections in Afghanistan and Pakistan as well as the potential for rising tensions may complicate already difficult situations.

9.16 Risk-mitigation activities: The GPEI is introducing multiple strategies at the international level to help ensure the safety of staff and the ability to access children. They include investing in political and security analysis to better understand evolving contexts; strengthening security coordination and communications across GPEI partners; reinforcing the capacity for political and conflict analyses; and continuing the study of best practice in

the handling of security threats in a humanitarian context. Recognizing that each situation is unique, the GPEI has identified a range of tactics to improve execution quality. Of primary importance is gaining community acceptance. Creating new alliances and partnerships with Muslim and Islamic financial, social and development-oriented institutions will promote greater public confidence in areas where polio is making its last stand. The GPEI is deepening its engagement with the Organisation of Islamic Cooperation and other Islamic institutions to increase public support, access and demand for polio vaccination.

9.17 For the three remaining endemic countries and Somalia, the GPEI has established a Strategic Framework for Polio Eradication under Complex Security Threats. It outlines the security threats in each country and identifies key strategies to mitigate them and maintain continuity of programme operations. The basic elements of the framework are:

- operational adjustments to polio campaigns
- programme safety and security
- community demand
- religious leaders' advocacy
- measures to prevent poliovirus spread.

9.18 Host government capacity and strength of response are the most important factors in risk mitigation, supported by local threat assessment, security planning, coordination and strategic deployment of security assets. Within the Strategic Framework, a key element is the development of security access operations plans with the overarching principle to "Stay and Deliver" – maintaining polio-eradication programme criticality at a high level across the United Nations, ensuring safety and security mechanisms go beyond hardware and a bunker approach, and instituting strong local capacity for threat assessment, conflict analyses and negotiations with all parties. The framework will also seek to maximize the use of local versus international staff, who should have expertise in conflict, political mapping and associate skills. It will be complemented by structures and practices that promote transparency and accountability.

9.19 Strengthening security capacity – including an emphasis on training polio managers on security management, accountability and engagement strategies – will help prepare staff to handle issues as they arise. The engagement model going forward will focus on enhanced coordination and information sharing, including engagement with the UN Department of Safety and Security, UN security, resident coordinators, UN country teams and local government security forces.

9.20 Security analysis will also be disaggregated to a more local level to identify and engage non-traditional partners and decision-makers, and to allow for the effective identification of issues and the development of area-specific strategies. This approach has been used in limited ways in Afghanistan and has offered valuable insight into the nature, timing and duration of conflict and calm.

9.21 Finally, the GPEI is exploring the viability and potential of packaged health services delivery or "pluses". Fatigue associated with campaigns and distrust for the programme may be overcome if a larger set of health services are offered that deal with other acute needs (e.g. clean water).

9.22 Contingencies: A series of contingencies may be utilized in regions where insecurity cannot be managed and access to children is restricted despite the best efforts of national governments and the international community. Following WHO Executive Board deliberations and guidance in January 2013, an International Health Regulations committee would be convened to advise the Director-General of WHO on additional measures that should be implemented to reduce the risk of international spread, which might include recommendations on the vaccination of travellers in and out of inaccessible areas and, if necessary, travel restriction into those areas. Eradication efforts would rely heavily on vaccination points in and out of inaccessible areas, with an effort to increase the vaccination coverage of surrounding areas. Civil-military structures would be revisited to see how they may be helpful and the GPEI would consider substantially increasing incentives for periods of calm and invest in advocacy and mediation for corridors of peace for vaccination. In addition, the polio infrastructure would be used to support the rapid extension of immunization services in specific areas with the addition of IPV and, during windows of opportunity, an expanded age range of children (up to 15 years of age) would be vaccinated.

9.5 Decline in political and/or social will

9.23 Risk: Three different issues related to political and societal commitment may threaten the success of eradication efforts. The first is the loss of momentum often sustained during periods of political change, including elections and governmental transitions. The second is the risk that subnational-level political entities will resist national government commitment to eradication, complicating cooperation. The third is the risk of communities' reduced or limited interest in polio-eradication activities. The reasons for this waning consideration vary according to the local context, but include fatigue, problems with polio staff or health staff, misunderstanding, lack of information, religious and or local practices, marginalized or vulnerable groups, and mobile and nomadic population groups.

9.24 Risk-mitigation activities: Structures and mechanisms have been, and will continue to be, established in each of the endemic countries to ensure that strong support for eradication efforts at a national level are continued and that a similar commitment exists at the state and district levels. Eradication efforts must imperatively be institutionalized and not intertwined with individual political actors. In certain circumstances it may also be necessary for GPEI partners to consider assuming increased responsibility for national programmes and bringing in additional, experienced outside talent until federal-level transition is complete. Support from bilateral and multilateral organizations will be sought to help influence these types of situations. To counter community and health-worker disinterest, appropriate strategies will be developed to promote local ownership and advance leadership that helps communities embrace the goals of eradication, by addressing specific needs and requests.

9.25 Contingencies: If eradication efforts are impeded due to political resistance, and advocacy from the national, regional and international leadership does not translate into timely action, the GPEI may be left with little choice but to postpone activities and allow the situation to improve before resuming operations.

9.6 Lack of accountability for quality activities

9.26 Risk: Accountability against established programmatic targets and outcomes – at all levels (global, national, regional, district, organization, individual) – is critical to reaching key eradication milestones. While detailed plans on reaching these targets and outcomes exist at national levels, no legal framework holds the GPEI partners and countries accountable. The inability to impose meaningful consequences for missing or failing to achieve targets poses threats to the Plan's full execution.

9.27 Risk-mitigation activities: This strategic Plan details critical targets and indicators by objective, with specific ownership assigned against each, which will promote greater transparency and accountability, allowing the GPEI to clearly understand, at any point in time, whether and how much progress has been made and who is responsible. Furthermore, the GPEI is continuing its efforts to enhance its governance structure, for example by raising issues to the United Nations General Assembly and consistently keeping polio on the World Health Assembly agenda, and stressing global-level accountability and deliberating international health regulations for non-compliance. The World Health Assembly governs the scope and direction of the GPEI at the global level. At the management level, the GPEI has refined its structures to ensure greater accountability with management groups reporting to the Polio Oversight Board. At the national level, polio programme managers report directly to Presidential/Prime Ministerial Task Forces. [30] The IMB provides a vital independent oversight function and will be sustained and used as a mechanism to shine light on risk-bearing issues.

9.28 Contingencies: If plans are not followed and targets and outcomes are missed, it may be necessary to escalate issues to international bodies. In addition, although challenging to orchestrate in a manner that is not counter-productive, the GPEI may consider forms of punitive consequences as a last resort.

[30] More detailed information on governance and management structures is available in Chapter 11.

10. Enabling functions

10.1 Successful execution of the *Polio Eradication & Endgame Strategic Plan 2013-2018* will require collaboration across GPEI partners, national governments, donors and other relevant organizations and institutions. While national governments will primarily be responsible for the successful execution of the Plan at the local level, the GPEI and its partners will lead on a set of enabling functions to facilitate the successful execution of country operations. These functions are:

1. Strategic planning and priority setting
2. Resource mobilization and advocacy
3. Financial resources and management
4. Vaccine security and supply
5. Research and policy development

10.1 Strategic planning and priority setting

10.2 The GPEI's spearheading partners (WHO, Rotary International, CDC and UNICEF) and the BMGF are responsible for providing overall technical direction and strategic planning for the management and coordination of the GPEI, including the development of strategic plans for the GPEI and the delivery of accompanying budgets. Global strategic plans are developed by national governments in conjunction with the partner and donor community to ensure that national and stakeholder priorities are reflected. Once finalized, the spearheading partners and the BMGF work to ensure that all components of the strategic plans are implemented. This includes oversight of technical support for strategy implementation and a leading role in monitoring and evaluating all aspects of the plans.

10.3 Technical assistance is deployed to fill capacity gaps when relevant skills are unavailable within a national health system, to build capacity and to facilitate international information exchange. This technical assistance ensures sufficient human resource capacity for immunization campaign planning (including microplanning, logistics, forecasting and supply management) and maintaining the AFP surveillance network.

10.4 The GPEI has historically been required to change agreed plans and cancel immunization campaigns due to unpredictable funding. In the event that sufficient funds are not available to fully support the GPEI budget in 2013 and 2014 when the focus is upon achieving the interruption of WPV1 and WPV3, available resources will be allocated according to the following priorities:

Priority 1	core staff (12 months of funding)
Priority 2	Surveillance and Laboratory Network (6 months)
Priority 3	endemic country SIAs (6 months)
Priority 4	outbreak response (3 months)
Priority 5	high-risk/other country SIAs

From 2015 onwards, resource allocation priorities will be updated to reflect a greater emphasis on Objectives 2 and 3, in particular product development and preparation for IPV introduction.

10.2 Resource mobilization and advocacy

10.5 The GPEI's spearheading partners and the BMGF have developed a strategy to obtain long-term, predictable funding for the 2013-2018 period. This will ensure that the lack of funding is not a barrier to the Plan's implementation and thus to polio eradication. The integrated resource mobilization, advocacy and communications strategy aims for:

- traditional donors to maintain or increase their commitments;
- new and non-traditional donors to be activated;
- polio-affected countries to increase their domestic financial contributions;
- innovative financing mechanisms be identified and exploited.

10.6 Sustainable financing will require renewed commitments from governments and development partners as well as the recruitment of additional country support. The participation of civil society organizations is critical, as is the importance of individual and private-sector giving, such as that provided by Rotary International. Significant financial support comes from some polio-affected countries, which should be further strengthened. National governments should continue to play a leading role in identifying resource needs and sources of self-financing and coordinating with immunization partners to track the effective, efficient use of resources.

10.7 Resource mobilization is increasingly coupled with advocacy and communications activities to ensure donors have confidence that the GPEI will deliver and that the benefits of a polio-free world are worth achieving. A key element is ensuring ongoing confidence from partners, countries, donors, influencers and the engaged public, so each player remains supportive of the GPEI and committed to the long-term strategy. The GPEI is working with a broader set of advocacy partners, e.g. the Global Poverty Project,[31] with the capability to reach younger audiences and new markets. Additionally, the partnership has invested in reaching a wider set of influential people – former politicians, technical and scientific leaders, well-known business leaders, academics and others – to inform them about the immediate window of opportunity to eradicate polio and employ both their voices and their networks in support of the programme.

10.8 To support the Plan, coordinated advocacy efforts will be developed and implemented, targeting the polio-endemic countries, high-risk countries and polio-free areas. The advocacy efforts will address three areas:

- ensuring the sustained, high-level commitment of polio-endemic and high-risk countries' national governments to provide oversight and accountability for the full implementation of their national Emergency Action Plans and to allocate domestic financing;
- ensuring consistent commitment and ownership by subnational governments (provincial, state and lower levels as relevant) to closely evaluate the planning, implementation and monitoring of polio-eradication activities and to take immediate and appropriate actions to address local challenges;
- securing the support of the global community, including donor governments, multilateral organizations, private-sector organizations, civil society partners, the media and relevant

[31] See http://www.globalpovertyproject.com/.

religious institutions, to advocate with polio-affected governments and communities. This includes the engagement of multilateral fora, such as the African Union, the Organisation of Islamic Cooperation, the Commonwealth, the United Nations General Assembly, the Economic Community of West African States, the BRICS (Brazil, Russia, India, China and South Africa), and the Gulf Cooperation Council, to encourage polio-affected and high-risk countries to effectively implement their national plans and, when needed, to provide confidence to communities to allay their concerns about polio vaccinations.

10.9 Leading Islamic scholars and Muslim technical experts, under the aegis of Al-Azhar University, have formed an Islamic Advisory Group to leverage the historically strong role played by Islamic leaders in global eradication. This group will periodically assess the remaining and emerging socio-religious and political challenges to polio eradication in the remaining polio-affected parts of the Islamic world and propose solutions. Members will advocate within their constituencies and provide guidance on the social and religious responsibilities to protect children from vaccine-preventable disease and to eradicate polio. The work of this group will inform the efforts of relevant actors, such as the Organisation of Islamic Cooperation, the Gulf Cooperation Council, the Islamic Development Bank, other senior Islamic religious scholars and GPEI partner agencies and stakeholders.

10.10. Significant advocacy will also be necessary to engage the 145 WHO Member States to ensure the coordinated switch from tOPV to bOPV in their routine immunization programmes, to effectively implement the post-eradication elements of the Plan and to support the polio legacy planning process at the national, regional and global levels to ensure outcomes that are supported by the World Health Assembly.

10.3 Financial resources and management

10.11 The financial requirement for the activities contained in the Plan is projected to be US$ 5.5 billion. This figure does not include Government of India funding of approximately US$ 1.23 billion, or any other national or in-kind contributions (see *FRR*). This projection takes into account various scenarios and has been projected in consultation with relevant global, regional and country stakeholders.[32] An interagency resource mobilization strategy is being implemented with rigorous weekly follow-up to help mobilize funding commitments for 2013-2018. This strategy will be reviewed and revised after the Global Vaccine Summit to ensure the continued coordination of advocacy and resource mobilization activities. The US$ 5.5 billion cost model includes the following key assumptions:

- interruption of residual WPV transmission by the end of 2014;
- complementary OPV campaigns to boost type 2 immunity before the tOPV-bOPV switch and additional coverage as needed between 2014 and 2015, declining post-interruption;
- introduction of at least one dose of IPV in routine immunization prior to the tOPV-bOPV switch;

[32] An adjusted year of interruption of transmission would increase/decrease costs accordingly; however some flexibility is built into this budget.

- human resource surge capacity to support eradication efforts in remaining polio-endemic and high-risk countries;
- maintenance of outbreak response capacity through 2018;
- maintenance of 2013 levels of technical assistance, social mobilization, global laboratory requirements, and research and product development through 2018;
- maintenance of environmental surveillance through 2018;
- stockpile projections for 2014 and 2016 based upon existing contracts.

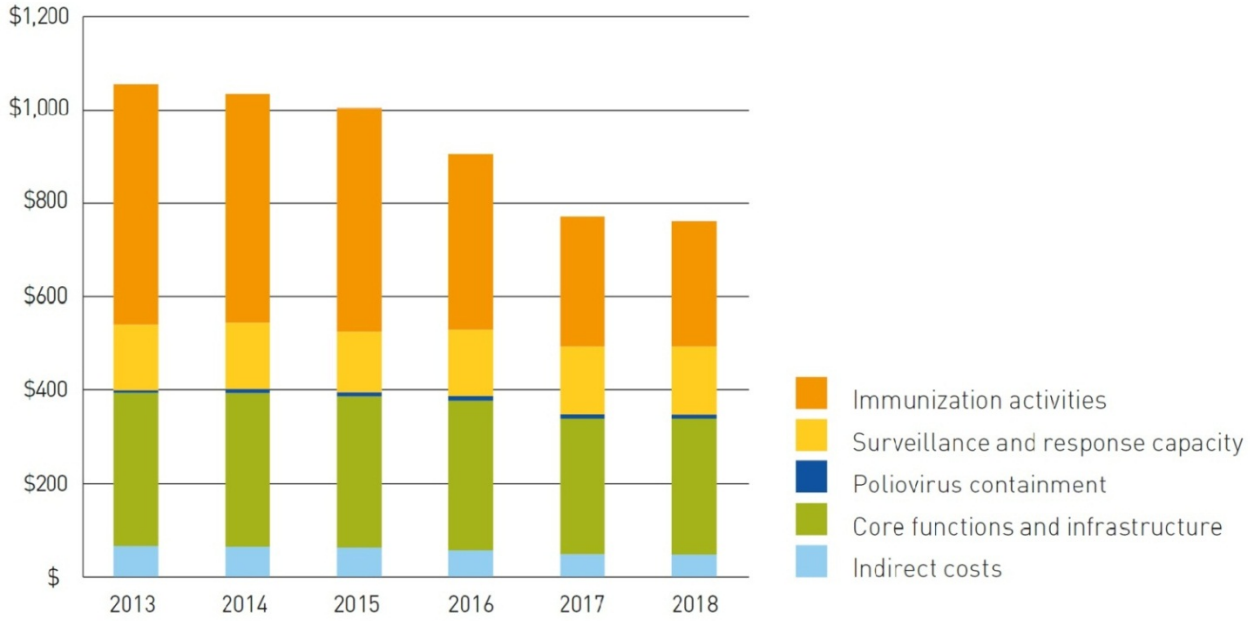
The key budget drivers are:

- the number of OPV campaigns;
- vaccine costs;
- technical assistance to countries;
- surveillance and laboratory costs;
- outbreak response capacity and stockpiles;
- IPV use in routine immunization.

The main cost components (Figure 18) are:

- immunization activities (OPV campaigns and IPV in routine immunization): 44%;
- surveillance and laboratory activities, response capacity, containment and certification: 16%;
- technical assistance: 19%;
- core functions (including surge capacity, research and development, ongoing quality improvement) and other indirect costs: 21%.

Figure 18: Plan budget by category, 2013-2018
(in US$ millions)



Source: GPEI, *Key Elements of the Financial Resource Requirements 2013-2018*, 14 February 2013. Available at http://www.polioeradication.org/Resourcelibrary/Strategyandwork/Financialresourcerequirements.aspx.

10.12 During the eradication and endgame period, OPV campaign activity will remain high through 2015 and then gradually decline. Technical assistance and surveillance costs will remain relatively stable. Some costs, such as those for innovation and campaign quality improvement, will decrease following the interruption of transmission. Other costs, such as the use of stand-alone IPV in routine immunization, will continue well after interruption of WPV globally.

10.13 The financial requirements for the period will be presented in an accompanying *Financial Resource Requirements* (*FRR*) document with corresponding costs and underlying assumptions per major budget category. The financial requirements will be reviewed and updated quarterly and the proportion of requirements under key budget categories adjusted as progress against key milestones is evaluated.

10.14 Although costs have not been modelled beyond 2018, reduced levels of continued funding will be needed beyond polio-eradication certification in 2018, including limited OPV campaigns and technical assistance continuing into 2020 as bOPV is withdrawn globally. Additionally, the GPEI expects certain costs associated with containment, surveillance and lab expenses to continue for up to five years post-certification.

10.15 The GPEI has continually evaluated costs throughout the implementation of polio-eradication activities and sought opportunities to ensure the good stewardship of available resources. An independent Value for Money (VfM) study for the GPEI was conducted from mid-2012 to early 2013. The study identified opportunities to create efficiencies and shift resources to other areas, improve risk-mitigation measures, enhance forward planning, discuss cost-sharing with other initiatives and expand the use of best practices to achieve greater value for money.

10.16 The VfM study findings included near-term opportunities to improve OPV buffer management and vaccinator training quality/frequency over the next 12 months; medium-term opportunities to adjust the scale of operations as areas become polio-free (improving target population estimates and optimizing SIA frequency) over the next one to two years; long-term opportunities to be captured in the legacy planning process and implementation of the legacy plan over the next two to six years; and best-practice opportunities where there is already good value for money that could be capitalized upon and expanded (i.e. cost-sharing, reaching the hard-to-reach, leveraging new technology). The near-term opportunities represent maximum potential cost savings of up to 6% for OPV costs (buffer management) and up to 3% for operations costs (training frequency). The medium-term opportunities represent maximum potential cost savings in the area of SIA campaigns of up to 11% through improving target population estimates, or up to 8% for optimizing the frequency of SIAs campaigns. The long-term opportunities could represent up to 13% cost savings in the area of technical assistance by optimizing expenditure on personnel, or up to 21% in cost increases to technical assistance avoided (risk-reduction) through improved long-term planning for the use of GPEI infrastructure and activities. The value of technical assistance that benefits other initiatives or areas is estimated to be up to 21%.

10.17 The VfM study improved the GPEI's understanding of the major cost drivers underpinning the FRRs, the key challenges to controlling costs and the potential risks that

could result in cost increases if not managed. Overall, through the process of developing the FRRs and conducting the VfM study, the date of interruption of transmission was identified as having the single biggest impact on the overall budget. The findings of the VfM study provide useful recommendations on the tools, planning processes and risk-mitigation measures the GPEI can apply to ensure that the budget envelope is respected, in particular during the period leading up to the interruption of WPV transmission.

10.4 Vaccine security and supply

10.18 Sufficient supply of OPV (bOPV and tOPV) to meet the global requirements for SIAs and the routine needs of countries is a key programmatic priority. The programme must have the capacity to respond to changing demand requirements due to epidemiological shifts in the virus, outbreaks in any one type and increased target populations, while also meeting global demand requirements for routine immunization. As the GPEI procurement partner, UNICEF has long-term arrangements with multiple suppliers to meet the projected demand and will endeavour to maintain a continuous buffer of 70 million doses of OPV to meet outbreak response and other unplanned vaccine requirements.

10.19 OPV demand projection is based on the annual SIA calendar and estimated routine immunization requirements, for UNICEF-procuring and non-UNICEF procuring countries. Long-term supply arrangements are in place in line with the projected SIA and routine demand for UNICEF-procuring countries in support of the implementation of the Plan. Supply is monitored continuously, with monthly and quarterly reviews to ensure supply by type meets planned SIA activities and is sufficient to meet routine needs. To support activities under Objective 2 – OPV2 withdrawal, ensuring a switch from tOPV to bOPV and providing one dose of IPV – supply requirements will be carefully planned in advance, including ensuring sufficient bOPV and IPV to support the tOPV-bOPV switch. Concurrently, global vaccine supply will be taken into consideration to ensure non-UNICEF procuring countries are able to access sufficient OPV supply for the tOPV-bOPV switch.

10.5 Research and policy development

10.20 An intensified research agenda has underpinned many of the approaches outlined in the Plan and will be critical in its implementation. Strategically guided by the Polio Research Committee (PRC) and the SAGE, the core elements of the research work are designed to accelerate eradication of the remaining WPV transmission and to ensure the necessary strategies and products are in place to manage the long-term poliovirus risks associated with the polio endgame.

10.21 To facilitate the tOPV-bOPV switch (and help prepare for the eventual cessation of all OPVs in routine immunization), the research agenda will help drive the risk management strategies through the implementation of the necessary prerequisites for the switch (validation of persistent cVDPV type 2 elimination and WPV2 eradication; stockpile of mOPV type 2 and response capacity; surveillance and international notification of Sabin, Sabin-like and cVDPV type 2; availability of licensed bOPV in all OPV-using countries; affordable IPV options for all OPV-using countries; and containment Phase II for cVDPV type 2 and WPV2 and Phase I for Sabin type 2). The work to ensure the availability of

affordable IPV options includes the realization of low-cost IPV options (i.e. new intradermal fractional dose and adjuvanted IPV formulations, Sabin IPV formulations and possibly new delivery technologies, e.g. needle-free administration).

10.22 Ongoing and new research projects are evaluating innovative methods to improve operations – particularly to help address persistent SIA coverage and surveillance gaps. A specifically established cross-partner Interagency Innovation Working Group is coordinating work to ensure innovative solutions to help address identified systemic challenges. Examples include assessing technologies such as GIS to more adequately identify missed areas or population groups during SIAs; evaluating community perceptions to communications strategies; examining the role of older age groups in outbreak settings; assessing the use of cellular-phone technology for data transmission in LQAS and to help prompt active AFP surveillance; and expanding the role of environmental sampling.

11. Governance, monitoring, oversight and management

11.1 Governance

11.1 As the primary WHO decision-making body, the **World Health Assembly**, comprised of all 194 WHO Member States, provides the highest level of governance of the GPEI (Figure 19). The World Health Assembly adopts the resolutions that determine the scope and direction for the GPEI globally and secures the commitment of all Member States to support the full implementation of the GPEI Strategic Plan. **WHO regional committees** allow for more detailed discussion by Member States, adopt resolutions on polio eradication and its impact at a regional level and provide input to **WHO Executive Board** deliberations that then inform the discussions at the annual World Health Assembly meeting.

11.2 Advisory and monitoring

11.2 A set of advisory, monitoring and technical groups inform the decision-making of WHO governing bodies and provide oversight of the management bodies.

11.3 The **Independent Monitoring Board (IMB)**, an independent body appointed by the Director-General of WHO after soliciting nominations from GPEI core partners (i.e., WHO, Rotary International, CDC, UNICEF) and the BMGF provides programmatic oversight of the GPEI, in particular the implementation of Objective 1 of the Plan. The IMB meets on a four-to-six-monthly basis to independently evaluate progress on the basis of polio epidemiology, poliovirus virology, standard performance indicators and other programme data. Additionally, the IMB provides assessments of the risks to the programme and informs the Polio Oversight Board. The IMB is comprised of global experts from a variety of fields relevant to the work of the GPEI. The IMB will continue in its functions until the end of 2015. The GPEI responds to the IMB's recommendations and guidance in managing eradication efforts.[33]

11.4 The **Strategic Advisory Group of Experts on immunization (SAGE)**, supported by the **SAGE Polio** and **GVAP Working Groups**, provides technical oversight for all GPEI global policy decisions on immunization. The SAGE will be the advisory body providing oversight on the implementation of Objective 2 of the Plan. The SAGE provides guidance to the World Health Assembly and informs the Polio Oversight Board. **Regional and national Technical Advisory Groups (TAGs)** are comprised of experts in related fields of polio eradication, and regularly convene to review a region or country's polio epidemiology and make recommendations for appropriate strategies to more rapidly achieve eradication.

11.5 The **Global Commission for Certification of the Eradication of Poliomyelitis (GCC)**, an independent body appointed by the Director-General of WHO, oversees the

[33] Reports of the IMB are available at http://www.polioeradication.org/Aboutus/Governance/independentmonitoringboard/Reports.aspx.

process for certifying the world as polio-free and will provide oversight on the implementation of Objective 3 of the Plan. **Regional Certification Commissions (RCC)**, independent bodies appointed by WHO regional directors, will certify their regions as polio-free once WPV transmission appears to have been interrupted in a region (i.e., 36 months after the last circulating WPV is detected), and provide the GCC with essential polio eradication documentation. **National Certification Committees** report to their respective RCC.

11.3 Oversight

National authorities

11.6 National governments are both the owners and beneficiaries of the GPEI. Polio-affected countries should undertake the full range of activities detailed in their country plans and summarized in this Plan and take primary responsibility for the achievement of the first three major objectives of this Plan. Achievement of country milestones requires polio-affected countries to ensure accountability at the national, subnational and district levels and, with GPEI partners, to plan, implement and monitor the activities to reach every child with polio vaccines. Concurrently, national governments in the three WHO regions certified as polio-free and polio-free Member States in the three remaining polio-endemic regions have a critical role to play in maintaining high population immunity and sensitive surveillance for AFP. National authorities are also responsible for fully implementing internationally agreed processes to manage the long-term risks following WPV eradication, including applying biocontainment requirements and mainstreaming polio functions as part of the legacy work.

11.7 The **Polio Oversight Board (POB)**, comprised of the heads of agencies of core GPEI partners, provides close oversight of the GPEI and programme management, and ensures high-level accountability across the GPEI partnership. The POB receives and reviews input from the various advisory and monitoring bodies (IMB, SAGE, GCC) and operational information from the **Polio Steering Committee (PSC)**. The **POB's** directives are implemented by the PSC through the various programme management bodies. The POB meets quarterly. The POB's deliberations are also informed by the global Polio Partners Group (PPG).

11.8 The global **Polio Partners Group (PPG)** serves as the stakeholder voice for the GPEI in the development and implementation of strategic plans for eradication and fosters greater engagement among polio-affected countries, donors and other partners to ensure the GPEI has the necessary political commitment and financial resources to reach the goal of polio eradication. PPG meetings are held at the ambassadorial/senior-officials level and results are reported to the POB.

11.4 Executive management

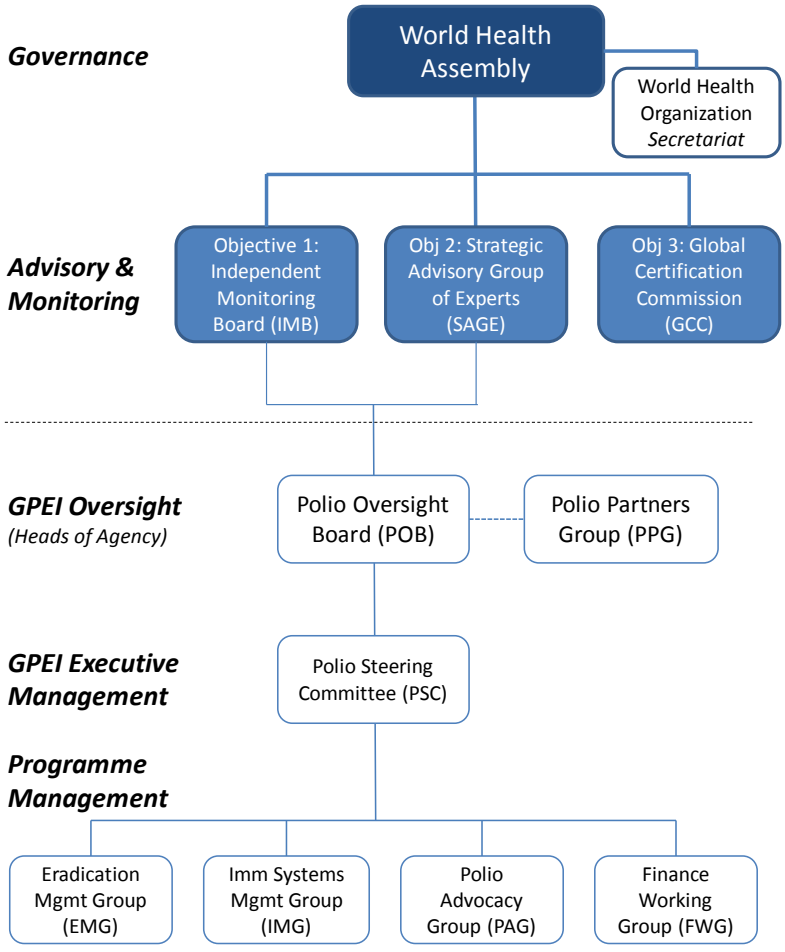
GPEI Partners

11.9 The GPEI's spearheading partners and the BMGF take primary responsibility for the management of activities described under the Enabling functions section (Chapter 10). This

includes responsibility for providing technical support to countries in the implementation of their polio-eradication efforts and the staffing surge to support national efforts. As part of the legacy, WHO and UNICEF will take responsibility for mainstreaming technical functions within existing and/or new or revised structures. The GPEI will coordinate the consultative aspect of the legacy process.

11.10 The **Polio Steering Committee (PSC)**, comprised of senior-level officials from the GPEI partner agencies, serves as the overall GPEI executive management body that closely reviews and monitors the global programme's various technical, financial and advocacy functions, provides direction and input to the work of the various management bodies, and also implements the directives of the POB. The PSC will drive the implementation of the objectives of the Plan and also provide necessary input to the advisory and monitoring bodies. The PSC's policy and strategy decisions are implemented through the GPEI management groups described below.

Figure 19: GPEI governance and oversight



Source: GPEI, http://www.polioeradication.org/.

11.5 Programme management

11.11 Four management groups that report to the PSC have overall responsibility for implementing the Plan, working with WHO and UNICEF regional offices, national governments, other stakeholders and country-level partners.

11.12 The polio **Eradication Management Group (EMG)** is responsible for the overall management of the activities under Objective 1: to achieve eradication in the endemic countries and those at highest risk of importation, attaining high-quality SIAs and surveillance while managing security risks. The work of the IMB, the SAGE, the GCC and RCCs and the regional and national TAGs informs and supports the work of the EMG.

11.13 The **Immunization Systems Management Group (IMG)** is responsible for the overall management of the activities under Objective 2: to strengthen immunization systems and introduce IPV and bOPV. The work of the IMB, the SAGE, the GCC and RCCs and the regional and national TAGs informs and supports the work of the IMG. The IMG also works closely with the Global Polio Laboratory Network and the PRC.

11.14 The **Polio Advocacy Group (PAG)** is responsible for the development and implementation of a cross-agency resource mobilization strategy to ensure that the required financing is available to fully implement the Plan. The PAG also works closely with and receives input from the communications staff of partner agencies and finance/resource management staff through the polio Finance Working Group.

11.15 The polio **Finance Working Group (FWG)** is responsible for closely tracking the programme's short- and long-term financing needs, developing consistent and accurate financial information for strategic decision-making and establishing processes to support the predictability of financing.

11.16 Additional groups reporting to the three management groups will be formed as needed to support key areas of responsibility and enabling functions. Management structures within the GPEI will be outlined in detail on the GPEI website at http://www.polioeradication.org/. These structures will be reviewed and modified regularly to reflect the changing needs of the initiative. In addition, the website will provide the terms of reference of GPEI management and functional support groups.

12. Monitoring

12.1 Monitoring Framework

12.1 The GPEI has developed a high-level Monitoring Framework to assess progress against the major milestones and targets laid out in the Plan. This contains both Output and Outcome indicators aligned with the major objectives of the Plan. Given the duration of the Plan, the Monitoring Framework is not intended to be a full monitoring and evaluation plan but aims instead to provide an overview of progress against the Plan's major objectives. As detailed workplans are developed for each of the objectives, in-depth monitoring and evaluation plans will also be developed. National plans should be referred to for details of national responsibilities, targets and progress indicators. The GPEI will provide detailed reporting on progress against key indicators to its oversight and governance bodies at agreed intervals to inform their work. The full framework is outlined in Annex B.

Annex A: Endemic country SIA quality specifics

Each of the three remaining endemic countries is implementing an Emergency Action Plan that focuses on eradication. Detailed endemic country eradication strategies reflecting the changing scenarios in each country and evolving epidemiology can be found in each country's plan at http://www.polioeradication.org/. This Annex describes plans to strengthen immunization systems and address the security situation in each country. The GPEI's Strategic Framework for Polio Eradication under Complex Security Threats is available upon request.

Afghanistan

"Afghanistan will do all it can to fight polio in Afghanistan and also in other countries where polio is still present."
—President of Afghanistan Hamid Karzai, High-Level Polio Event, United Nations General Assembly, New York, 27 September 2012

Overview

1. Afghanistan has successfully interrupted indigenous WPV transmission in all but one region of the country – Southern Region. In this region, the provinces of Kandahar and Helmand have been responsible for maintaining continued endemic WPV transmission, repeatedly reinfecting other provinces of the country and exporting poliovirus to neighbouring Pakistan. Achievement of a polio-free Afghanistan depends on all provinces in Southern Region overcoming the barriers to implementing the strategies that have yielded success elsewhere in the country while maintaining high-quality activities and rapid outbreak response in polio-free areas. The recent top-level government commitment to achieving polio eradication from President Hamid Karzai, along with a well-established track record for problem solving, innovation and close coordination among partners and government, means that the key ingredients for success are in place to rapidly achieve the as-yet elusive goal of a polio-free Afghanistan.

Epidemiology

2. All WPV cases in Afghanistan since 2010 have been WPV type 1. The last case of polio due to WPV3 was recorded in April 2010. The last case of WPV2 was in 1997, although cases due to the emergence of cVDPV type 2 have occurred since, the most recent cases having been reported in February 2013.

3. More than 70% of all polio cases in Afghanistan since 2010 have been reported in just 2 of 34 provinces (Kandahar and Helmand), representing less than 10% of the total population. This trend continued in 2012, with these two provinces reporting 22 of 37 cases (59%). The remaining 15 cases in 2012 were reported from seven other provinces: Kunar, 4; Khost, 3; Nangarhar, 2; Paktya, 2; Uruzgan, 2; Ghor, 1; and Farah, 1. An analysis of WPV genetic data by the regional polio reference laboratory in Islamabad shows the continuing reduction in genetic diversity, indicating the elimination of circulating poliovirus strains, and confirms

the southern endemic zone as the main source of continued WPV transmission in the country, with only sporadic cases due to cross-border transmission from Pakistan.

4. Polio continues to paralyse primarily young children in Afghanistan: 70% of cases in 2012 were in children under two years of age, meaning a lifetime of disability and increased risk of early death. Polio occurs in these children because they are heavily under-immunized compared with the general population; more than 57% of cases in 2012 had received less than three doses of OPV and approximately 33% had never received one dose of OPV (zero dose). This represents a failure of the programme to reach these children with either routine immunization services or repeated supplementary immunization campaigns. Understanding and overcoming the reasons these children and communities are missed is the key to achieving a polio-free Afghanistan.

Reasons for continued poliovirus transmission

5. Kandahar and Helmand provinces are the only remaining reservoir for endemic poliovirus transmission in Afghanistan. These two provinces frequently feature in global headlines due to intense conflict and insecurity and many have questioned whether it is even possible to reach enough children to interrupt polio transmission in such a volatile context. Without question, this setting acutely complicates the implementation of the polio programme's strategies. However, programme data show that most children are *not* missed because of conflict and insecurity but due to continued weaknesses in delivering OPV to relatively accessible communities.

6. An analysis conducted by the Government of Afghanistan, with support from WHO and UNICEF, showed that 80% of children identified by vaccinators as "missed" during a campaign were from areas in Southern Region without severe conflict and insecurity. Further, the analysis shows these children were missed because the vaccination team did not visit the house (30%), the child was absent from the house when the team visited (50%), the child was reported by parents and caregivers as being sick or asleep at the time of the team visit (15%), or the caregivers refused to have the child immunized (5%). The remaining 20% of overall missed children *were* located in areas where access was compromised due to insecurity and conflict. In these areas, the children were missed primarily due to the reluctance of field workers to conduct the activity because of a perception of insecurity or a lack of agreement for the activity by anti-government elements. With considerable human resource surge support in Afghanistan, the programme is meticulously tracking the reasons for missed children and using this information to inform the development of strategies to be implemented over 2013-2014 to ensure access to children whenever and wherever possible.

What's new? Strategies for success in Afghanistan

7. The strategies in Afghanistan are designed to maximize the programme's reach to accessible children during each SIA and in routine immunization (particularly in the endemic Southern Region) and to reduce the number of children missed at each successive round. These strategies are being implemented in the context of high-level oversight and accountability and with the support of an expanding, increasingly better trained field workforce. The guiding document for these strategies is the National Emergency Action Plan developed by the Government of Afghanistan with the support of its partners and officially launched by His Excellency the President.

Reaching chronically missed children in SIAs and routine immunization

8. Improved SIA microplanning: The Afghanistan polio programme is expanding existing microplans to improve operations. First, given the unpredictable security and conflict situation in the polio priority areas, all microplans will include a detailed analysis of the access realities of each area. Direct or third-party negotiations will be pursued in the most insecure areas with the aim of exploring conditions agreeable for activities to proceed (this could include flexibility in the timing of campaigns, the type of vaccinators involved or the means of vaccine delivery – fixed-post or limited house-to-house). When activities can proceed in areas that have not had OPV for an extended period, the programme will immediately seek to deliver multiple doses at short intervals (SIADs) and offer a broad range of health interventions during that window of opportunity. In all areas, additional mobile teams will be deployed to increase the opportunity to immunize children outside of the household – on the street, at playgrounds or at markets. Finally, the procedure for recording missed children and revisiting households with missed children during or immediately after the campaign will be regularly reviewed, revised and closely tracked to provide maximum opportunities to reach every child.

9. Better selected, trained, monitored and supported front-line workers: A primary strategy will be to establish appropriate vaccinator selection committees with local membership, guided by partner organization staff to find workers who are both acceptable to the local community and as accountable as possible. In the Afghanistan context, local customs restrict easy entry into the household, requiring the recalibration of vaccinator teams to include females whenever possible. Other options will be explored in areas where this is opposed, including recruiting females accompanied by male family members, recruiting local birth attendants, etc. Efforts will be increased to equip all teams with attractive health incentives – items to benefit newborns and other children and motivate caregivers to vaccinate all children, even those sleeping, playing in the street, sick or newborn. Finally, the capacity development of front-line workers is being revised to be more practical and hands-on and to include interpersonal communication skill building to equip teams for success at the household.

10. Mobilized communities: Community engagement is a core strategy for success. In priority districts of Afghanistan, a full-time community mobilization network is being developed incorporating two types of mobilizers: those who work at the household level and those who can reach out to community leaders. At the household level, mobilizers will dialogue with caregivers about immunization and other integrated health interventions and encourage the immunization of their children in both routine immunization and every polio round. At the community level, religious, health and other local leaders will be identified and engaged to support the programme, and important social gatherings where vaccines can be distributed will be systematically identified. All activities will be supported by an overarching media campaign and messages on the radio and other media outlets.

11. Monitoring and supervision leading to corrective action: Lessons learnt from India show that monitoring is most effective when it results in immediate, in-course corrective actions. The Afghanistan programme is revising its monitoring procedures so findings can be available for daily evening meetings during polio immunization activities where required actions and accountable persons will be identified for immediate follow-up. The programme

will also introduce LQAS[34] as the gold standard for assessing campaign performance and use this data to track trends in the quality of immunization campaigns.

12. Responding to polio outbreaks in areas outside of the endemic transmission zone: To protect the gains in areas that have succeeded in interrupting endemic poliovirus transmission, all provinces in Afghanistan will conduct at least four supplementary immunization campaigns per year to boost immunity achieved via routine immunization. Further, a national outbreak response team will be established to visit any province outside the southern endemic zone that reports a polio case to engage with the provincial governor and provide technical support for conducting the required immunization outbreak response. Any case reported outside the southern endemic zone will be covered by at least three large-scale, short-interval outbreak response immunization activities launched within two weeks of case notification.

13. Other innovations: The programme in Afghanistan has an established track record for finding innovative solutions to seemingly intractable problems. One such solution that will be expanded is the use of permanent polio teams. In areas of insecurity, vaccinators are hired on a permanent basis and requested to visit households in a continual cycle – outside the timing of campaigns. The permanent polio teams are trusted local people, supported by regular resupplies of vaccine and supervision. Efforts to immunize travellers at major transit points and border crossings will be redoubled, including Standard Operating Procedures for district-to-district cross-border coordination and the systematic exchange of information. Immunization teams will continue operation on both sides of the Pakistan/Afghanistan boundary at all major border crossings.

Routine immunization

14. In conjunction with immunization partners, the GPEI will help support national government efforts to intensify routine immunization efforts across the country. Quarterly Expanded Programme on Immunization (EPI) meetings will be conducted with NGOs to review performance progress, while monthly meetings will be held in priority areas – including in Southern Region. Clearer linkages will be identified and built between polio and routine immunization. AFP surveillance data and active polio surveillance visits will be used to help monitor routine immunization efforts. Finally, polio staff and systems will be leveraged to communicate routine immunization services to local populations to generate awareness and demand.

Ensuring effective oversight and accountability

15. Accountability for activities and the delivery of results are instrumental to achieving implementation of the key national strategies. Accountability in Afghanistan must involve the front-line field workers, the international partners supporting the activity and district/provincial government officials ultimately tracked at the highest level, the Office of the President. An accountability framework has been developed with clearly identified terms of reference for each polio manager at the provincial and district levels, along with reporting

[34] The Lot Quality Assurance Sampling (LQAS) method classifies areas of interest corresponding to "lots" as having acceptable or unacceptable levels of vaccine coverage. This method detects pockets of low vaccine coverage and therefore directs focused vaccination efforts.

lines, processes of performance appraisals against clear deliverables and follow-up action based on the appraisal results that will be used to gauge progress and take appropriate action.

16. To ensure the full engagement of government structures, the President of Afghanistan has assigned a Focal Person for Polio Eradication to liaise between the office of the Minister of Public Health and the President, engage and ensure the accountability of the provincial and priority district governors, and support and monitor assistance provided by other ministries and international partners. Provincial governors – particularly the Governors of Kandahar, Helmand, Uruzgan, Kunar and Farah – will be requested to engage district governors and members of Shura to oversee the quality of vaccination campaigns. Provincial governors will submit reports on each vaccination round to the office of the President and Ministry of Public Health, and quarterly polio-eradication meetings between provincial governors and the President will be held.

17. Polio Control Rooms will be established at the national level and in all high-priority districts and provinces. Their purpose is to be the real-time link between the district, provincial and national levels to facilitate the real-time monitoring of the campaign and provide in-course guidance to the field.

Human resource surge support and enhanced technical assistance

18. The Government of Afghanistan's partners in polio eradication will provide support for these activities by considerably expanding the number of field-based staff in priority areas. UNICEF is bolstering the Immunization Communication Network[35] to cover at least 90% of the low-performing and priority districts through both full-time and campaign-specific social mobilizers. WHO is working with the Government of Afghanistan to hire additional polio officers in all low-performing districts. Together, both partners will conduct a series of technical and managerial trainings of district EPI management teams and other relevant staff to increase capacity.

Outcome

19. Full implementation of the activities outlined above will increase accountability, address the root problems of SIA quality and increase community engagement in the worst-performing areas. To make sure the programme remains on track in implementing these activities, at least two meetings per year of the Technical Advisory Group for Polio Eradication in Afghanistan will be convened to assess progress and recommend corrective action to the government. The outcome should be increased campaign quality measured using LQAS, resulting in increased immunity in the population of Southern Region and, ultimately, the interruption of endemic WPV transmission from Afghanistan by the end of 2014.

[35] The Immunization Communication Network is a social mobilization network operating in the eastern, western and southern regions of Afghanistan. Most of the front-line workers are deployed to the high-risk Southern Region.

Pakistan

"Eradicating polio is a national priority for Pakistan and is also a personal mission for my family."
—President of Pakistan Asif Ali Zardari, High-Level Polio Event, United Nations General Assembly, New York, 27 September 2012

Overview

1. Despite a complex and volatile security backdrop, including attacks on polio health workers, the polio-eradication programme in Pakistan made substantive and fundamental improvements to its strategic and operational approaches in 2012. Most crucial was the transformation in the level, intensity and structure of government oversight, programme operations management and performance accountability. These steps, coupled with intensified partnership support bolstered by a human-resource surge, have led to an impressive reversal in the direction of a programme that was spiralling downward as it faced a series of escalating polio outbreaks between 2008 and 2011. Based on the progress and the lessons learnt in 2012, the programme has identified and refocused its strategic priorities and updated the National Emergency Action Plan 2013, calling it the "Last Low Season" for polio in Pakistan.

2. The episodes of violence against health workers, including polio vaccinators, in 2012 and escalating social disruption in advance of national elections expected in the spring of 2013 undoubtedly pose formidable challenges to the programme in Pakistan. While the strategic priorities and the road map to interrupt poliovirus transmission are clear, the programme is taking steps to maintain the continuity of operations, sustain progress and minimize any losses to gains achieved in 2012 even if unable to access or conduct immunization activities in certain areas.

Epidemiology

3. Multiple important and encouraging epidemiological developments took place in 2012, signalling significant progress towards the eradication of polio. Of the three previously established polio reservoirs – the FATA and adjoining KP province, certain suburbs of Karachi and three districts in Baluchistan that make up the "Quetta Block" – in 2012 transmission continued only in the FATA-KP reservoir. The number of polio cases fell threefold, from 198 cases in 2011 to 58 cases in 2012. The number of areas with recorded poliovirus cases fell from 60 districts in 2011 to 28, and the programme witnessed a substantial reduction in the genetic diversity of WPV1, falling from 11 genetic clusters isolated in 2011 to 4 in 2012. With the exception of KP, all provinces saw a decline in the number of cases during the high poliovirus transmission season. Finally, no WPV3 has been detected in environmental surveillance in Pakistan for more than two years and the most recent type 3 polio case occurred in April 2012.

4. Reducing the number of missed children through higher quality campaigns is the key factor that underpinned this progress in 2012. LQAS, the most objective measure to directly estimate the quality of polio campaigns, has shown a steep and consistent trend in the improvement of campaign coverage. Using LQAS, whereas only 18% of lots were accepted at 95% vaccination coverage during the January 2011 polio campaigns, 78% of lots were

accepted at 95% coverage during the October 2012 SIA. Even in KP province, which experienced an outbreak in 2012, LQAS trends show significant improvement – from 35% lots accepted at 95% in May 2011 to 90% in October 2012. Consistent with these data, the proportion of "zero OPV dose" children declined in all areas of Pakistan from 2011 to 2012, with the exception of FATA. The implementation of the National Emergency Action Plan and the strong progress achieved in 2012 have positioned the programme in Pakistan to make a concerted effort to stop polio transmission in 2013-2014.

Reasons for continued poliovirus transmission

5. A combination of factors has led to continued poliovirus transmission in Pakistan, including inaccessibility in FATA and parts of Karachi, remaining gaps in programme management, transparency and performance accountability, suboptimal vaccination team selection, inadequate engagement of local-level communities, and gaps in the follow-up of missed children and corrective actions. These factors have been compounded by a complex and unstable security environment and by the fact that routine immunization coverage has fallen rapidly in all of Pakistan's provinces over the last two years, threatening population immunity to polio, particularly to type 2 poliovirus (in the Quetta Block, an outbreak of cVDPV type 2 emerged in late 2012 with cross-border spread to adjoining areas of Afghanistan).

6. Despite these challenges, access to children in some areas has improved considerably. In FATA, for instance, the number of inaccessible children has fallen from 327 000 at the end of 2009 to 64 000 by March 2012. However, inaccessibility in parts of Khyber Agency has persisted and militant leaders announced a ban on polio vaccination of children in North and South Waziristan in mid-2012, withdrawing access to an estimated 260 000 children. These developments have further underscored the importance of social mobilization, broad stakeholder engagement, political advocacy and civil-military cooperation in access-compromised areas.

7. Important lessons are being learnt on managing security challenges in contexts like Gadaap, Karachi, where a polio worker was killed in July 2012. Following this incident, the local district administration took control of the situation and conducted well-planned vaccination campaigns, including strategically deployed security personnel, the mobilization of suitable vaccinators and consistent engagement with the local community and their leaders.

8. The disproportionate representation of Pashtun populations among polio cases (85% in 2012), the isolation of polioviruses from environmental surveillance linked with circulation in KP and FATA, and lower polio vaccination rates coupled with lower awareness of polio vaccination among Pashtun compared with non-Pashtun populations highlights the fact that the programme continues to fail to reach, engage and serve Pashtun populations adequately. The fact that Pashtun populations are highly mobile, both across the border into Afghanistan and into areas like Gadaap, Karachi, underlines the need to urgently engage Pashtun populations for polio immunization. As Pakistan and Afghanistan comprise a single epidemiologic block for polio, with continued cross-border transmission of polioviruses (principally across the southern border in Balochistan and the northern border in FATA), the successful interruption of poliovirus will increasingly require synchronous progress in both countries.

What's new? Strategies for success in Pakistan

9. While significant challenges are being encountered in Pakistan, important lessons continue to be learnt and valuable insights gained through the implementation of the National Emergency Action Plan. Based on the impact achieved, lessons learnt and remaining programme challenges following the implementation of an augmented National Emergency Action Plan 2012, in consultation with partners the Government of Pakistan has developed the National Emergency Action Plan 2013. Its overarching goal is to interrupt poliovirus transmission by the end of 2013. The major thrust of the plan is to aggressively implement the major strategic priorities in the National Emergency Action Plan during the 2013 low poliovirus transmission season in Pakistan.

Reaching chronically missed children in SIAs and routine immunization

10. Focused vaccination of high-risk groups and areas with SIAs/SIADs: A more refined high-risk approach has clearly defined the key polio reservoirs, the high-risk districts and within them the worst-performing and high-risk union-councils.[36] A very aggressive schedule of polio vaccination campaigns is being conducted in these areas of FATA, central KP, Quetta Block and selected parts of Karachi, and in the populations from these reservoirs settled elsewhere (Pashtun settlements in Lahore, Rawalpindi, Faisalabad and Hyderabad), with up to six vaccination campaigns in the 2012-2013 low season. The mainstay of the SIA strategy is the application of the SIAD regimen in reservoir and high-risk areas. Given the lower vaccination rates among Pashtun children and the disproportionately high incidence of polio in this population, the programme is developing detailed mapping of these communities outside FATA and KP, and special communications and operational strategies to engage and reach the children in Pashtun communities, and expanding its transit strategy to increase the establishment of vaccination posts at major transit points and in movement corridors frequented by these populations.

11. Integration of operations and communications microplans: The responsibility for planning and implementing polio vaccination campaigns is now assigned to the District Commissioner, who is the chief executive officer of the district. The District Commissioner will assign responsibility for microplanning and vaccination team and supervisor selection to the union-council medical officer instead of to the paramedical zonal coordinators, many of whom were chronically underperforming and/or misappropriating resources. The full integration of operational and communications microplans to engage and reach high-risk populations is a key priority. Although support for operational microplanning and community mobilization has been intensified in high-risk areas, the two planning streams still need to be fully integrated to address both the operational and social factors responsible for children missed during vaccination campaigns and to enable systematic follow-up to vaccinate these children. Microplans will be developed in coordination with all stakeholders in the union-council to include integrated area-specific operational and community engagement activities.

12. Real-time monitoring: Intra-campaign monitoring with real-time in-course data review in the district Polio Control Room evening meetings is essential to enable immediate corrective actions during the active phase of campaign implementation. The programme has

[36] Union-councils are sub-district administrative units.

established clear indicators of campaign preparedness with the creation of a "campaign dashboard" that triggers the deferral of campaigns in union-councils that do not meet preparedness criteria. The wide use of LQAS to assess campaign quality in the worst-performing areas has also proven hugely beneficial in documenting improvements in the vaccination of children, reflecting the continued need to improve the quality of independent monitoring. To enable planning for campaign preparedness, monitoring and corrective action, district Polio Control Rooms are being established, where the newly formed district and union-council Polio Eradication Committees can meet to ensure cross-sectoral coordination.

Vaccinating children in insecure areas

13. A major priority for 2013-2014 is intensified and increasingly operational civil-military cooperation. The coordination of security with local authorities to generate continuous area-specific risk assessments has been institutionalized with the emergency constitution of Provincial Security Coordination Committees for polio eradication. These committees are comprised of senior officers from law enforcement and security forces. Under this umbrella, local heads of security agencies are now members of the district polio-eradication committees. Based on local security assessments, campaign implementation is adjusted with modified operational tactics and flexible microplanning (speed of operations, phased implementation, fixed-site versus house-to-house delivery, level of visibility), and with tailored communications combined to optimize the security of polio workers in the local context.

14. The engagement of community leaders, local imams, parents and youth groups is being intensified to support the programme and provide community vigilance and protection to health workers. New alliances and partnerships with Muslim and Islamic institutions have been established and communications strategies tailored to the local context with field-tested materials to generate acceptance for OPV. The programme is also exploring the viability of delivering additional health services to overcome fatigue with, or mistrust of, campaigns in specific areas.

15. The two implementing partners, WHO and UNICEF, are taking a number of steps to ensure their intensified support of the programme despite the escalation in security threats. Both agencies have developed security access operations plans with "Stay and Deliver" strategies for each unique polio reservoir. Crucially, the agencies will maximize the use of local versus international staff, with expertise in conflict management, political mapping and associated skills.

Routine immunization

16. In conjunction with immunization partners, the GPEI will work closely to expand routine immunization reach, including within Pashtun populations. The GPEI supported field staff will help harmonize polio SIA microplans with routine immunization microplans to identify populations unreached by routine services. The GPEI will assist and advocate with local authorities to establish immunization services in the most vulnerable populations. Immunization sessions and the availability of logistics and human resources will be systematically monitored and locations with poor routine immunization coverage will be mapped. Communications on polio eradication will include customized messages for high-

risk populations to increase awareness and demand for immunization. The responsibilities and specific tasks of GPEI staff will be clearly defined and monitored for supporting routine immunization services.

Ensuring effective oversight and accountability

17. Substantial changes have taken place in Pakistan to ensure effective oversight and accountability. At the highest level, polio eradication was declared a national emergency by the President of Pakistan in 2012, resulting in the constitution of a National Task Force on Polio Eradication chaired by the Prime Minister and composed of provincial chief ministers and chief secretaries, and the appointment of a cabinet-level leader as the Prime Minister's Focal Person on Polio Eradication to head the newly created Polio Monitoring Cell in the Prime Minister's secretariat. In addition, a Polio Control Room was created in each province. The government launched the National Emergency Action Plan 2013 with direct oversight of its successful implementation by the National Task Force on Polio Eradication.

18. With guidance from the National Task Force on Polio Eradication and the increasing effectiveness of the Prime Minister's Polio Monitoring Cell, provincial support and oversight continues to improve, as has the engagement of District Commissioners and the formation of district and union-council polio-eradication committees. The real enforcement of performance accountability using objective and standard criteria has been achieved through a Monitoring Framework that can deliver real-time district performance to the highest levels of government. Important gaps remain, however, in the full operationalization of the provincial and district Polio Control Rooms and the optimal functioning of the union-council Polio-Eradication Committees. To tackle this shortcoming, a senior (secretary-level) officer will be appointed to oversee and manage the provincial Polio Control Room in the office of the Chief Secretary of each province.

Human resource surge support and enhanced technical assistance

19. To support the full implementation of the augmented National Emergency Action Plan and drive local efforts to stop the circulation of poliovirus in 2013, Pakistan has recruited thousands of additional field workers to support local union-council and district authorities, further bolstered by the UNICEF and WHO human resource surge, with more than 1,350 new workers deployed in high-risk districts and union-councils.

20. After successful pilots in 2012, the polio programme will fully implement the Direct Disbursement Mechanism that pays vaccinators and other campaign field workers directly through bank transfers. This crucial strategy not only ensures vaccinators are paid fully and promptly, but encourages the selection of appropriate vaccinators rather than child or "ghost" vaccinators. Special strategies are being employed to engage female community members as vaccinators in high-risk areas, accompanied by male family members when required. Capacity development initiatives, including the training of front-line workers in interpersonal communications skills to maximize the effectiveness of interaction with caregivers, are being set up to improve performance, while the enforcement of performance accountability is now possible using objective and standard criteria through a framework that includes district and provincial Control Rooms, the Prime Minister's Polio Monitoring Cell and the National Task Force on Polio Eradication.

Outcome

21. Full implementation of the activities outlined above will increase accountability, address the root problems of SIA quality and increase access and community engagement in the worst-performing areas. To make sure the programme remains on track in implementing these activities, at least two meetings per year of the Technical Advisory Group for Polio Eradication in Pakistan will be convened to assess progress and recommend corrective action to the government. The outcome should be increased campaign quality measured using LQAS, resulting in increased immunity in the KP and FATA populations and, ultimately, the interruption of endemic WPV transmission from Pakistan by the end of 2014.

Nigeria

"I wish to reaffirm Nigeria's steadfast commitment to eradicate polio. We believe we must do it and we are progressing."
—President of Nigeria Goodluck Jonathan, High-Level Polio Event, United Nations General Assembly, New York, 27 September 2012

Overview

1. Nigeria remains the only country in Africa yet to interrupt indigenous transmission of WPV. However, in the last four years, it has made remarkable progress in shifting the course of the disease from a recurrent cycle of large-scale, national outbreaks to more focal transmission in well-defined reservoirs in northern states. This positions the country to intensify and direct its resources to find and immunize unprotected children, while sustaining the gains made since 2008 in improving overall population immunity.

Epidemiology

2. Nigeria reported the circulation of all three poliovirus serotypes in 2012: WPV1 and WPV3, as well as cVDPV type 2. Historic progress was achieved between 2009 and 2010 in restricting what was previously widespread national transmission to persistent transmission in localized sanctuaries in northern Nigeria, with a reduction in annual reported wild type cases from 388 to just 21. Despite notable increases in the total number of WPV cases reported since then – from 62 in 2011 to double that number in 2012 – transmission is now mostly focused in key reservoirs across northern Nigeria. In 2012, 97% of polio cases were located in just 100 of 9,555 wards in the country.

3. Additionally, from the beginning of 2011 through November 2012, the genetic diversity decreased for both WPV1 and WPV3 despite the increase in the number of cases. As reported by the CDC, the number of co-circulating clusters of WPV1 fell from eight in 2011 to four in the second half of 2012; for WPV3, four clusters were reduced to only one. The decreases in genetic diversity likely correlate with the reductions in geographic spread: both types appear to be once again restricted to northern Nigeria. Kano state, in particular, plays a key role as a transmission hub for all serotypes and has reported more cases cumulatively than any other state since 2010. The northern states of Katsina, Kaduna, Borno, Sokoto, Jigawa and Zamfara have also been identified as localized sanctuaries for continued transmission over the last three years. WPV spread from these key reservoirs to four previously polio-free states in late 2012, underscoring the need to address transmission in these key reservoirs to preserve gains achieved over the last five years.

4. Despite these challenges, Nigeria is making progress. A Global Good analysis of the OPV status of children investigated for paralysis indicates that immunity levels needed to stop transmission are improving across the highest-risk northern states. In 2008, when Nigeria had its last large outbreak (798 cases), estimated population immunity was approximately 42%. By the end of 2012, the estimated fraction of the population immune to polio had climbed to 64%. This improvement in immunity is accompanied by the sharp decline in reported polio cases.

5. LQAS, which is now being used extensively in the programme as a measure of the quality of immunization campaigns, is also showing improvement. Between May and December 2012, the number of LGAs measured with LQAS that were accepted at >80% coverage nearly doubled from 35% to 69%.

Reasons for continued poliovirus transmission

6. Children with polio in Nigeria are almost all from poor families; they live in rural, hard-to-reach settlements in border areas between LGAs or states, are not visited by vaccinator teams or have parents who refuse the vaccine. These border areas are also often in close proximity to major travel routes for nomadic herdsmen, whose children are chronically missed by the programme. GIS maps of northern Nigeria developed for the polio programme show that 80% of polio cases in 2012 were located on the border areas between LGAs and states. Such new tools are helping the Nigeria programme pinpoint its greatest challenges.

7. In built-up rural villages and urban areas, the performance of vaccinator teams is the key determinant of whether or not a child is immunized. Independent monitoring data suggest that the biggest cause of missed children – nearly 40% – is teams not seeking out all children (as of October 2012). Families who refuse to accept the vaccine are also a barrier to immunization. According to the same data, 18% of children were missed due to refusals. "Refusals" tend to be clustered, particularly in the urban areas of Katsina, Kaduna, Sokoto and Kano, where communities are influenced by clerics who claim the vaccine will create sterility or make people sick. Communities also refuse vaccination because their leaders say it is not a priority or because of demands for other services. In parts of the states of Borno and Yobe, insecurity remains a significant obstacle; a recent escalation of sporadic violence in Kaduna and Kano resulted in the death of polio workers.

What's new? Strategies for success in Nigeria

8. The programme in Nigeria aims to achieve an SIA coverage target of 80% of children under the age of five across high-risk areas by the end of 2013 while maintaining other areas polio-free. The focus is to improve the quality of immunization activities in rural settlements and urban areas; reach children missed previously by the programme; and fast-track the response to the spread of virus in areas of the country that have been polio-free.

9. Several reinforcing thrusts in the Nigeria programme are driving change. First, an unprecedented level of political commitment to polio eradication is driving accountability and coordination at all levels. Second, the need to improve the quality of each polio campaign is strongly recognized so that fewer children are missed. Third, a new culture of innovation is allowing the programme in Nigeria to adapt global best practices. Fourth, Nigeria is making a significant effort to revitalize its immunization programme, including leveraging the massive polio effort in ways that help overcome some of the systemic and operational hurdles that are keeping vaccines from reaching children. Each of these was already present to some degree in the Nigeria programme – what has changed is the scale at which these inputs are now operating; the intensity of management and oversight by the federal and state governments; and the rigorous use of independently collected and managed data to validate performances in reaching children.

Reaching chronically missed children in SIAs and routine immunization

10. Improved SIA microplanning: Campaign microplans have been updated by the LGA teams through intensive engagement supported by WHO at the local level. For example, in Nigeria this resulted in the identification of more than 3000 additional settlements in mid-2012 that were missed in previous planning exercises. Nigeria is also using some of the tactics pioneered in India's successful polio programme. Staff from that programme are providing regular input into the work in Nigeria, including a revision of the tools used for microplans. Nigeria also shifted to a house-based approach to its microplans so that teams are assigned specific households, rather than the general instruction to immunize within a village or urban neighbourhood.

11. Better selected, trained, monitored and supported front-line workers: Nigeria will continue to maximize the restructuring of vaccinator teams implemented in 2012 to ensure adequate supervision and oversight is maintained. Vaccination teams have been restructured from six-person to four-person teams, including a community leader. This improves the teams' mobility and makes the supervision and validation of work more effective. Concurrent monitoring has been used to observe team performance and ensure real-time corrective action; teams found not to have covered their assigned area well are pulled back immediately to perform their work again. Rigorous implementation of agreed-upon guidelines for selecting, training and monitoring vaccinators is now instigated in all areas. For example, traditional leaders through Ward Selection Committees are taking increased responsibility for the proper selection of vaccinators and recorders. As such, there has been an increase in female vaccinators and recorders in local areas and ward-level daily meetings have been instituted to increase team oversight and drive local accountability. The newly inaugurated emergency operations centres in high-risk states will work with local authorities to test and implement strategies for improving team motivation and performance management, including vaccinator recognition/incentive programmes. The emergency operations centres have also developed a new, improved training package for vaccination teams that includes more hands-on practical exercises in the skills required of vaccination teams.

12. Mobilized communities: Full local ownership and participation in immunization services has always been a challenge in some communities of Nigeria. To address this issue and increase real demand for polio and other immunization antigens, a Volunteer Community Mobilizer Network was launched by UNICEF in early 2012, which has been expanded to target high-risk areas and add scale in 2013. This sensitizes mothers further in highest-risk settlements to the importance of polio eradication and immunization. In 2013, partnerships with religious groups and specific leaders, such as the Tsangaya (Koranic) School Strategy, traditional leaders, polio survivors and the Federation of Muslim Women's Associations in Nigeria (FOMWAN), will be expanded at the community level. This will be supplemented by an extensive visibility and mass media strategy, with entertainment-education at its centre. UNICEF will introduce and evaluate a new interpersonal communication skills kit to improve vaccinators' ability to engage effectively with community members, with special trainings to be initiated in 2013. It will also collect social data to understand the reasons behind missed children (particularly children absent from the home) and develop strategies to address these barriers. The systematic engagement of religious leaders is being intensified to increase public support for the programme and complement the steps that are being taken to address the anti-vaccine misinformation

campaigns launched recently by some academics and clerics. Non-compliance and low demand for polio vaccination are affecting vaccination in urban centres in Kano, Kaduna, Katsina and Sokoto. Efforts to improve vaccine demand and uptake include a renewed focus on "pluses" that are in high demand, such as vitamin A, deworming tablets and routine vaccination.

13. Monitoring and supervision leading to corrective action – data and local accountability: In Nigeria, campaign dashboards showing critical LGA-level campaign preparedness and implementation indicators are being utilized to more effectively prepare and track campaign implementation, and the government has begun to delay campaigns deemed "not ready" to implement immunization activities. This is helping to drive local accountability for SIA quality.

14. Focused interventions to reach previously missed children: A landscape exercise led by the Nigeria STOP programme (NSTOP) was conducted in 2012 and 2013 to identify nomadic, scattered and border settlements that were not included in the campaign microplans. As a result of this activity, a special round was implemented in January 2013, focusing on nomadic, border and scattered settlements in selected wards. Special vaccination campaigns will be broadened, targeting wards to accelerate the interruption of WPV transmission in localized areas, including borders, nomadic routes and hard-to-reach scattered settlements. These activities will be conducted periodically as stand-alone, in-between round activities and embedded within scheduled SIA rounds. Nigeria will also use the SIAD strategy to rapidly build immunity in communities that have not been reached before, or for prolonged periods, including security-compromised areas. The programme has also developed key in-between round activities (local Immunization Days, Market Strategy, naming ceremonies, newborn strategy) to better reach missed children. Where access is a problem because of insecurity (in parts of Borno, Yobe, Kano), the programme will also test the use of permanent polio teams who can take responsibility for ensuring the population in their defined catchment area is immunized over a specified period of time, rather than being bound by the campaign schedule. The programme will work closely with relevant agencies to assess security at the local level and will implement activities in a flexible manner in LGAs and wards where the security conditions permit implementation. The engagement of local stakeholders such as FOMWAN will be increased further to help overcome issues of mistrust and suspicion at the local level, especially where there is tension resulting from conflict and insecurity.

15. GIS mapping: Nigeria is making more extensive use of GIS mapping than any other country in the global polio programme. These maps are helping to improve settlement identification, resource allocation and microplanning, and also incorporate the mapping and engagement of nomadic populations. A pilot study took place in July 2012 in 10 LGAs in 7 states, which was expanded in August 2012 to 41 LGAs in 10 states. It found more than 8000 additional settlements not already included in microplans, 15% of which had never been visited by a vaccination team. Now all are in the microplan. The programme will continue intensive engagement with traditional rulers to identify and track the immunization of children at the settlement level.

Routine immunization

16. The strengthening of immunization systems is urgently needed in Nigeria, and the polio programme understands it has a significant role to play. The GPEI partners (both polio and EPI) are working with other development partners to support the federal government in the development of a national immunization and accountability framework, which will include active participation in Interagency Coordinating Committee working groups to strengthen vaccine supply and management, monitoring and evaluation, training and social mobilization. Recently, the government and partners have developed a Harmonized National Immunization Plan as a first step towards the development of an integrated annual EPI activity plan that includes accelerated disease control activities (measles catch-up campaigns, yellow fever and meningitis vaccination campaigns) and the strengthening of routine immunization.

17. WHO, in particular, will substantially leverage its nationwide network of surveillance officers and the polio emergency surge personnel to monitor and generate evidence on vaccine availability, routine immunization programme implementation and disease surveillance. The CDC will focus on strengthening the capacity of the national government for data management and analysis. During 2013, WHO, UNICEF and CDC will support eight states to implement accelerated immunization outreach activities to address persistent transmission of cVDPVs. Additionally, WHO and UNICEF will collaborate with Kano state, the Dangote Foundation and the BMGF in a three-year effort to revitalize routine immunization from 2013. The focus will be on improving the tracking of vaccine supplies, supporting data management efforts, emphasizing training and monitoring immunization sessions, and intensifying social mobilization activities to increase the demand for immunization services.

Ensuring effective oversight and accountability

18. Nigeria's political commitment to polio eradication is unprecedented. President Goodluck Jonathan leads the national effort through a Presidential Task Force and reviews progress quarterly. The Minister of State for Health chairs the Task Force, which includes federal legislators, state health commissioners, traditional leaders and GPEI partners. The Task Force has commissioned emergency operations centres in Abuja (established), Kano (established) and four other states to drive operational planning, monitoring and feedback, thus providing greater opportunity for programme coordination, monitoring and accountability.

19. A new "dashboard" is being used by the emergency operations centres to assess the readiness of the programme to implement each of its supplementary immunization campaigns. With a three-week countdown, states and LGAs need to report against a number of indicators to assess their preparedness: funds released, planning meetings held, ward team selection committee meetings taking place, microplans verified, social mobilization initiated, trainings conducted and logistics in place. The dashboard data are being used by the Task Force to hold state, LGA and the immunization staff accountable for the quality of the work. Poor preparedness is resulting in campaigns being suspended and administrative sanctions against government and partner staff. Although local state and LGA-level accountability is not yet fully optimized, it remains a major priority that is being pursued through the Task Force, emergency operations centres and rigorous review of dashboards and monitoring data.

20. The Presidential Task Force also tracks the political oversight provided by state Executive Governors and LGA chairmen through the Abuja Commitments, a declaration signed by the Executive Governors in 2009. The Abuja Commitments require the state's political leadership to oversee polio and immunization activities, ensure the release of state funds and involve the state's traditional leaders in the programme's planning and implementation. President Goodluck Jonathan personally intervenes when these commitments are not met. Pre- and intra-campaign advocacy field visits to the highest risk states and LGAs by Task Force members also provides feedback and motivational support to political leaders and technical teams at the operational level.

21. The BMGF instituted an Immunization Challenge in 2012 to reward those states that performed best in achieving key polio and routine immunization targets. In 2013, the Challenge will focus on rewarding those states that interrupt WPV transmission. Winning states receive a grant award for a public health priority identified by the state's Executive Governor.

Human resource surge support and enhanced technical assistance

22. WHO will maintain support through 2018 for the 2500-strong human resource surge initiated in 2012, with ongoing efforts to improve surge personnel management and accountability processes. UNICEF has expanded its communications capacity in LGAs in the high-risk states. Over 1800 volunteer community mobilizers have been deployed to the highest risk settlements, with further expansion in 2013. The CDC will support greater data analysis capacity within the National Primary Healthcare Development Agency of Nigeria and through its NSTOP programme. The Nigeria programme will continue its technical exchange with India, including periodic deployment of Indian surveillance medical officers to high-risk areas in Nigeria.

Outcome

23. Full implementation of the activities outlined above will increase accountability, address the root problems of SIA quality and increase community engagement in the worst-performing areas. To make sure the programme remains on track in implementing these activities, at least two meetings per year of the Expert Review Committee for Polio Eradication in Nigeria will be convened to assess progress and recommend corrective actions to the government. The outcome should be increased campaign quality measured using LQAS, resulting in increased immunity in the key northern-state populations and, ultimately, the interruption of endemic WPV transmission from Nigeria by the end of 2014.

Annex B: Monitoring Framework 2013-2018

Strategic Plan Objectives	Outcome Indicators	Output Indicators					
		2013	2014	2015	2016	2017	2018
<u>Poliovirus Detection and Interruption</u>: **Complete the interruption of wild poliovirus transmission globally and more rapidly detect and interrupt any new outbreaks due to vaccine-derived polioviruses** **<u>Monitored by the IMB</u>**	***All wild poliovirus transmission stopped by end-2014*** ***All new cVDPV outbreaks stopped within 120 days***	Achieve and maintain an AFP rate of >2/100,000 in all states/provinces of high-risk countries Achieve and maintain adequate stool sample collection in 80% of cases in all states/provinces of high-risk countries Establish >80% LQAS-confirmed coverage in all high-risk areas of Nigeria and Afghanistan; >90% in high-risk areas of Pakistan Establish full safety and security framework in the 3 endemic countries All current cVDPV outbreaks stopped by end-2013	Establish 10 new environmental sampling sites in countries at risk of cVDPV and WPV outbreaks Maintain >80% LQAS-confirmed coverage in high-risk areas of Nigeria and Afghanistan; >90% in high-risk areas of Pakistan Convene IHR review committee; establish recommendations for post-2014 Develop full contingency plans to limit international spread and interrupt transmission	Establish 10 additional environmental sampling sites in countries with national OPV facilities If transmission persists, implement full contingency plans to limit international spread and interrupt transmission	Maintain certification-standard surveillance down to the first subnational level in all countries in certified and non-certified regions	Implement type 2 virus response protocol for post-OPV era	Establish type 1 & 3 response protocols for post-OPV era

Annex B: Monitoring Framework 2013-2018

Strategic Plan Objectives	Outcome Indicators	Output Indicators					
		2013	2014	2015	2016	2017	2018
Immunization Systems Strengthening and OPV Withdrawal: **Strengthen immunization services in "focus countries", introduce IPV and withdraw OPV2 globally** **Monitored by the SAGE**	***OPV type 2 withdrawn globally by end-2016*** ***At least 10% annual increase in DTP3 coverage achieved in 80% of high-risk districts of all focus countries from 2014 to 2018***[37]	Develop annual national immunization coverage improvement plans in at least 5 of the focus countries Put IPV supply and financing strategy for IPV introduction in place	Dedicate >50% of polio-funded field personnel's time to immunization systems strengthening tasks Develop annual national immunization coverage improvement plans in all focus countries Ensure all countries with national producers or self-procuring have access to a licensed bOPV product Achieve 10% year-on-year improvement in DTP3 coverage rates in high-risk districts in at least the 5 focus countries with plans established in 2013[38]	Establish mOPV2 stockpile of bulk and finished product Finalize target date for last OPV2 use Facilitate and support introduction of at least 1 dose of IPV into RI schedules in all OPV-using countries Achieve 10% year-on-year improvement in DTP3 coverage rates in high-risk districts in all focus countries	Finalize Global IPV policy for post-OPV era Achieve 10% year-on-year improvement in DTP3 coverage rates in high-risk districts in all focus countries	Achieve 10% year-on-year improvement in DTP3 coverage rates in high-risk districts in all focus countries	Establish mOPV1 and mOPV3 stockpiles of bulk and finished product
Containment and Certification: **Certify the eradication and containment of all wild polioviruses by end-2018 and enhance long-term global security from poliomyelitis** **Monitored by the Global Certification Commission**	***Global polio eradication certified by end-2018***	Align GAPIII with new endgame strategy and timelines	Certify WHO South-East Asia Region as polio-free Complete Phase 1 containment (survey and inventory) (except in polio-endemic countries)	Deliver WHO report to WHA on WPV2 eradication Gain international consensus on containment timing and safeguards	Implement biocontainment safeguards for all WPVs	Implement safe handling of all Sabin type 2 polioviruses	Complete certification process for all 6 WHO regions, leading to global certification of polio eradication Prepare for eventual containment of all Sabin polioviruses at the time of bOPV withdrawal

[37] In support of the targets outlined in the Global Vaccine Action Plan.
[38] e.g. 50% to 55% in year one; 55% to 60.5% in year two, etc.

Annex B: Monitoring Framework 2013-2018

Strategic Plan Objectives	Outcome Indicators	Output Indicators					
		2013	2014	2015	2016	2017	2018
<u>Legacy Planning</u>: Develop a plan to ensure polio investments contribute to future health goals, through documentation and transition of lessons learnt, processes and assets of the Global Polio Eradication Initiative **<u>Monitored by the WHA</u>** ***The objectives and indicators shown here are indicative***	***Polio legacy plan developed by end-2015***	Initiate global legacy planning process, including stakeholder consultations, asset mapping and capturing of lessons learnt	Complete broad consultation process on polio legacy	Establish polio legacy plan	Initiate implementation of the polio legacy plan		

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