

2 | Key Events 2010

January

10 India uses bivalent oral polio vaccine (bOPV) for the first time. Nigeria becomes the first African country to use the new vaccine during the 30 January Immunization Plus Days.

February

23 Iconic landmarks around the world are lit up with the slogan 'End Polio Now' in honour of Rotary International's 105th anniversary, as is Eilean Donan castle in Scotland.



MIKE PHIMISTER, ROTARY INTERNATIONAL

March

06 Across west and central Africa, leaders launch synchronized, multi-country polio vaccination campaigns.

April

23 Response activities begin for the Central Asian outbreak, the first in the World Health Organization's European Region since it was declared polio-free in 2002, with emergency grants from Rotary International, the United Nation's Central Emergency Response Fund and Japan. Imported from India, the virus demonstrates once again the vulnerability of polio-free areas until eradication is complete.

May

01 Players of the Afghan and Indian cricket teams exchange 'Bowl Out Polio' bats. Their high-profile game is viewed by thousands of cricket fans, helping to raise awareness of the polio eradication cause.



PRASHANT PANJARI, BILL & MELINDA GATES FOUNDATION

11-14 Visiting Bihar, India, Bill Gates is struck by the quality and reach of India's polio programme; he crosses the Kosi River to see this for himself. Mr Gates also visits Kano, Nigeria in June, as part of his ongoing support to polio-affected countries: "All Nigerians should be proud of Nigeria's recent progress against polio," he says.

June

18 The *Strategic Plan 2010-2012* is officially launched in Geneva, Switzerland, a month after its endorsement by the World Health Assembly. The Ministers of Health of Nigeria, Angola and Senegal, among a number of other senior health ministry officials, existing and potential funders, vaccine manufacturers and key partner organizations speak at the event co-hosted by WHO Director-General Margaret Chan and UNICEF Executive Director Anthony Lake.



CORNELIA WALINER, UNICEF

21 The ‘Kick Polio out of Africa’ football arrives in Montreal, Canada, at Rotary International’s Convention. The ball has traversed 22 polio-affected African countries, where it was signed by 22 dignitaries in an example of African unity in the fight against polio – among them, religious and traditional leaders of northern Nigeria.



August

04 Polio eradication staff and resources are mobilized to help in the response to the devastating floods in Pakistan.

22 Osman Hussein Ibrahim, District Polio Officer, is killed by a stray bullet while on duty in Mogadishu, Somalia. The tragedy serves as a stark reminder of the dangers faced by front-line health workers.

24 Russian President Dmitry Medvedev and Bono, the lead singer of rock band U2, discuss polio eradication. Bono says that polio is a “low hanging fruit”, as it is “nearly eradicated”.

October

12 The Angolan Minister of Health, Dr José Van-Dúnem, along with the Governor and Vice-Governor of Luanda province, join vaccinators during a nationwide polio campaign.

24 In celebration of ‘World Polio Day’ Rotarians around the world work in creative ways to raise funds for polio eradication. Among other events, 4.6 million purple crocus bulbs – the colour that is used to mark the fingers of vaccinated children – are sold and planted in Great Britain and Ireland, to bloom the following spring.

28 WHO Director-General and Regional Director of the Eastern Mediterranean Region launch National Immunization Days in tribal areas of Pakistan, together with the Chief Minister of Khyber Pakhtunkhwa Province of Pakistan.



November

11 An outbreak of imported poliovirus in the Republic of the Congo claims the lives of older children and adults and sends a chilling reminder of the deadly power of polio.

December

16 In a rigorous evaluation of the benefits and costs of eradicating polio, a study published in *Vaccine* finds that the programme could provide net benefits of at least US\$40-50 billion by 2035, mostly in low-income countries, if transmission of wild polioviruses is interrupted within the next five years.

21-22 The Polio Independent Monitoring Board meets for the first time.



3 | Strategic Plan 2010-2012

“This new plan will strike at the final reservoirs of polio and consign this terrible virus to history.”

Bill Gates, co-chair of the Bill and Melinda Gates Foundation, addressing the United States Congress in March 2010.

The world made rapid progress towards polio eradication soon after the Global Polio Eradication Initiative (GPEI) was launched in 1988. Case numbers began to plummet, three Regions of the World Health Organization were certified polio-free, transmission of one of the three serotypes of wild poliovirus was successfully interrupted worldwide – and by early in the new millennium, incidence of the disease had declined by a staggering 99%. The world expected that polio would soon be a disease of the past.

By 2005, the fight against polio had reached a stalemate. Endemic polio clung on stubbornly in limited areas of four countries: India (Uttar Pradesh and Bihar), Nigeria (northern states), Pakistan (parts of Sindh, Balochistan and North West Frontier Province and Federally Administered Tribal Areas), and Afghanistan (Southern Region). With most of the world polio-free, international spread of the virus from endemic areas led to recurrent outbreaks in polio-free countries. Despite the development of new tools in 2005 intended to dry up these remaining reservoirs – notably monovalent oral polio vaccines (mOPVs) – it became clear that the tactics which had eradicated polio from 99% of the world would not work in the remaining one per cent. That is why in 2008, the World Health Assembly (WHA) called for the development of new strategic approaches to finish the job once and for all. In 2008 and 2009, a number of key activities were tested and evaluated. The outcomes would ultimately help inform the new *GPEI Strategic Plan 2010-2012*.

A major independent evaluation examined the precise reasons why polio persisted in these key areas, and what additional tools or approaches might be necessary to secure success. What clearly transpired is that a ‘one size fits all’ approach could not work, as the barriers to success in each of these areas were unique. New approaches and products – ranging from a new bivalent OPV (bOPV – containing type 1 and 3 serotypes) to district-specific planning – were introduced and evaluated.

All of these new approaches and tools were institutionalized in the *Strategic Plan 2010-2012*, endorsed by the World Health Assembly in May 2010. The plan was then officially launched at a major GPEI stakeholder conference on 18 June 2010, co-hosted by World Health Organization (WHO) Director-General Margaret Chan and then-new United Nations Children’s Fund (UNICEF) Executive Director Anthony Lake.

Less than 12 months into the new *Strategic Plan*, the world began to see unprecedented results in areas that were long resistant to eradication strategies: most notably in the key reservoir areas of India and Nigeria and in outbreak settings in polio-free countries. The results demonstrated that the new approaches work, but only if they are fully implemented.



The launch of the GPEI Strategic Plan 2010-2012 at WHO in Geneva, Switzerland in June 2010.

Innovations in action

A range of tactical and product innovations underpin the GPEI *Strategic Plan 2010-2012*, to tackle the remaining barriers to polio eradication in the remaining endemic areas, facilitate swifter and more thorough outbreak response, and limit renewed international spread of polio. These approaches are regularly assessed and refined.

Bivalent OPV is the ‘game-changer’

Evaluated and developed in record time, the new bivalent OPV simultaneously targets both remaining wild poliovirus serotypes (WPV1 and WPV3) in a single dose. Clinical and field trials in 2010 confirmed this vaccine’s superior efficacy over the traditionally-used trivalent OPV, while offering similar protection to its respective monovalent OPV counterparts.

The availability of this new vaccine has changed the game, simplifying the logistics of running supplementary immunization activities (SIAs). Since its first use in December 2009 (in Afghanistan), use of bOPV was ramped up in 2010, reaching 179 million children in 17 countries. Any vaccine only works if it reaches children: the widespread use of bOPV was coupled with improved SIA operations

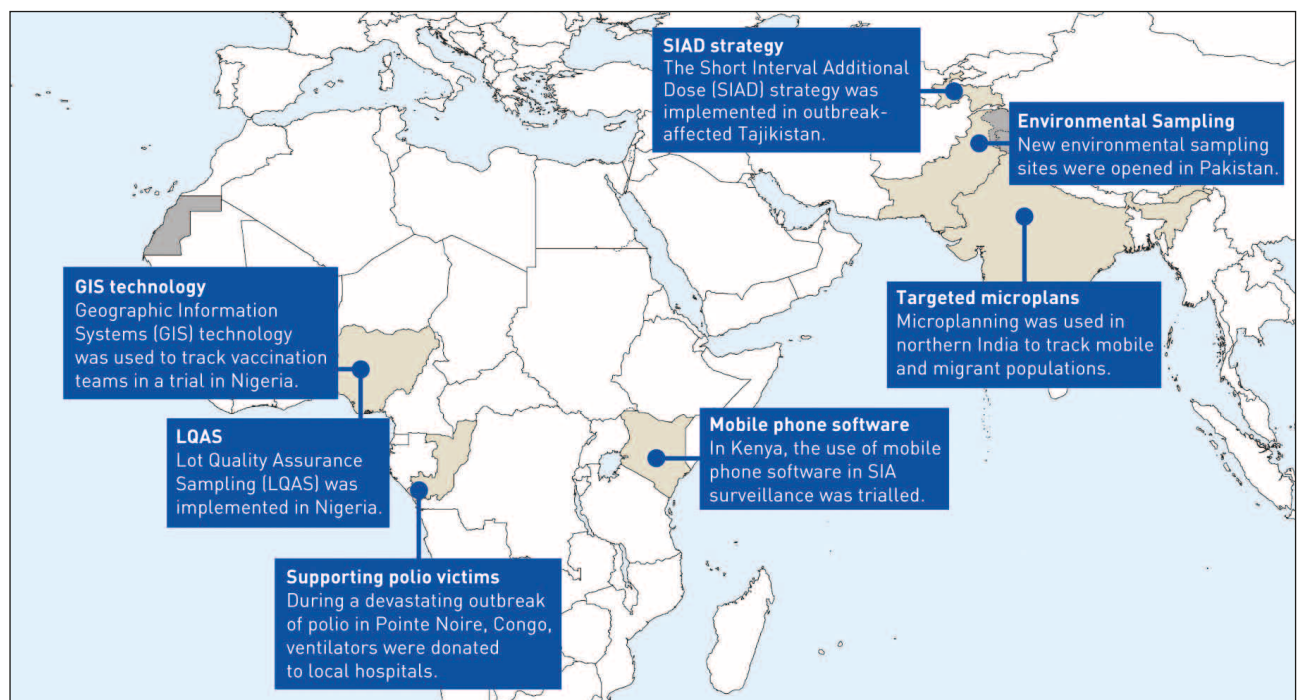
in 2010, reducing global levels of WPV3 transmission to their lowest ever and significantly reducing WPV1 in key endemic areas at the same time.

Targeted operational microplans reach more children, no matter where they are

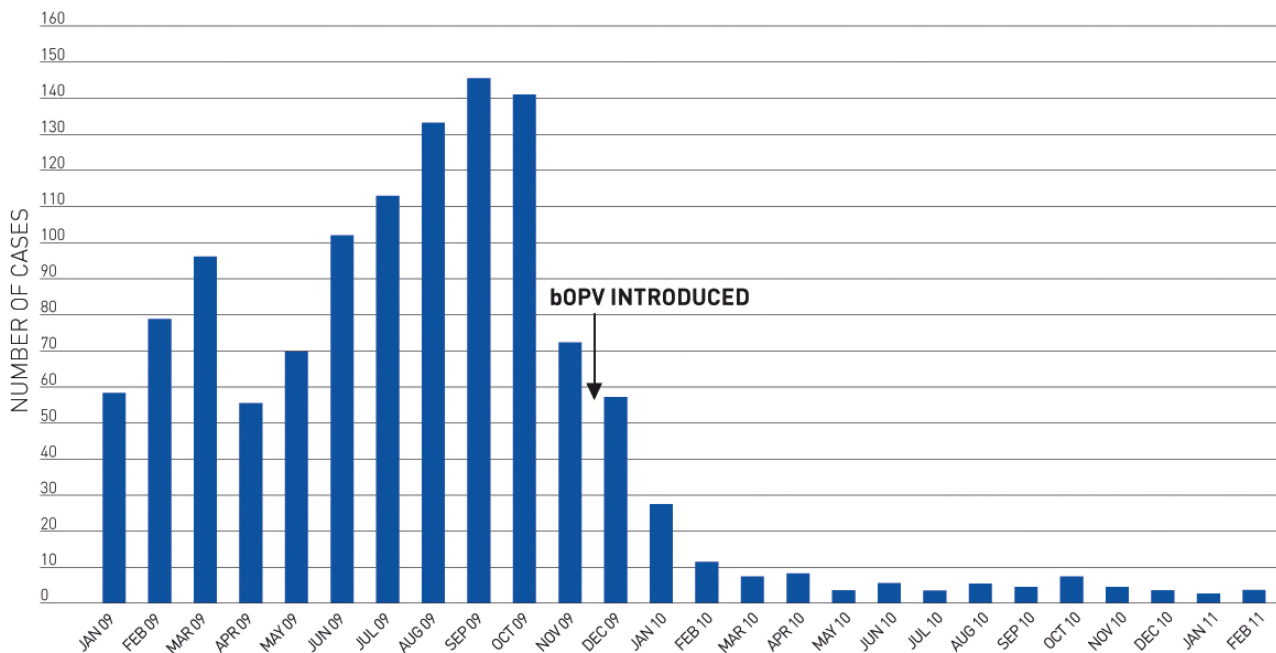
Poliovirus transmission now persists in only a handful of areas, surviving among the most vulnerable and often displaced populations. To reach the most marginalized groups of children, polio eradication efforts must zero in on the last virus strains in the most targeted manner possible.

This means identifying where the virus persists, both geographically, and socio-demographically, and then figuring out the best way to reach these groups given the unique factors at play in each place and each population. In some instances, this will mean focusing on identified highest-risk districts and using local, existing health and civil infrastructures to reach out to children (for example, in southern Afghanistan). In others, it means putting in place special strategies to vaccinate children among mobile and migrant population groups (such as in northern India).

New strategies in 2010



The effect of bivalent oral polio vaccine on WPV3



SIADs rapidly build immunity in conflict and outbreak settings

Children living in conflict-affected areas, or in areas which have been polio-free for a long time, are often particularly vulnerable to polio infection. In the former, vaccination may be difficult due to access; in the latter, vaccination may not be perceived as a priority because no polio cases have occurred in some time. A consequent build-up of susceptible groups – those who are un- or under-immunized – creates a fertile environment for poliovirus if it is present or introduced.

The Short Interval Additional Dose (SIAD) strategy was developed to more rapidly build population immunity levels in such settings. The SIAD strategy exploits the availability of monovalent OPVs to shorten the interval traditionally needed before administering subsequent doses. Trivalent OPV doses have to be administered at intervals of four to six weeks, due to interference between different poliovirus types contained in trivalent OPV, especially type 2. With monovalent OPVs, the issue of interference in subsequent dose administration has been removed (as only one poliovirus strain is contained in such vaccines), and subsequent doses can be administered at a shortened interval of one week.

This approach, first evaluated in Somalia in 2007, was an integral part of the response to the explosive outbreaks in 2010 in Tajikistan and the Republic of the Congo. It continues to be used to raise immunity levels in the persistent-transmission security-compromised districts of southern Afghanistan, and is planned for use in several difficult settings, including the Federally Administered Tribal Areas in Pakistan.

LQAS and enhanced independent monitoring evaluate impact

How many children are reached, and in which areas? Large-scale SIAs are a proven approach to stopping polio, but only if they are implemented at the highest level of quality. Any missed children allow the poliovirus a breathing space to survive and circulate.

In 2010, enhanced independent monitoring, coupled with Lot Quality Assurance Sampling (LQAS), aimed to provide a clearer picture of the impact of SIAs. New protocols and criteria were created to guide a real-time independent monitoring network, validated as necessary by LQAS (a standard quality assurance system whereby classified areas of interest, corresponding to 'lots', are sampled to determine 'acceptable' or 'unacceptable' levels of vaccine coverage). By rapidly identifying any areas with sub-optimal performance, mid-course corrections can be implemented and areas with deficits re-covered by secondary immunization teams, even during the same SIA.

Environmental surveillance, serosurveys and mathematical modelling shadow and predict poliovirus' movements

With polio transmission increasingly beaten back to isolated areas or among marginalized communities, the search for the virus takes on new urgency, to find out where it may be hiding, where it might go next, and which populations are most at risk. The active disease surveillance for acute flaccid paralysis (AFP) cases is the main search engine for polio cases. To complement this surveillance, the use of supplementary tools was stepped up in 2010, particularly in areas where programmatic and epidemiological data did not align.

Environmental surveillance, expanded in 2010 to high-transit urban areas in key zones in India and Pakistan, provided additional data on the extent of virus transmission. At the same time, serologic surveys more accurately determined population immunity, identifying gaps which must be filled. Finally, mathematical modelling of high-risk areas helped to predict which polio-free areas, or marginalized groups, are most at risk for re-infection and outbreaks.

These innovations enable a more thorough risk assessment and therefore the targeted allocation of resources to areas which most urgently need them.

Everyday technology used in new ways to reach more children with polio vaccine

The ubiquity of mobile technology was harnessed in 2010 to monitor the quality of SIAs. Real-time data collection and analysis were conducted by independent monitors through mobile phones and EpiSurveyor software to help monitor the quality of SIAs. Data is sent in real-time to a remote server, where it can be viewed and downloaded from any computer with internet access. Evaluated during SIAs in Kenya, this technology could further enhance the scaled-up independent monitoring and LQAS efforts. A second trial is ongoing in Pakistan; pending the outcomes, this approach could be institutionalized in 2011.

In Nigeria, in November 2010, a pilot study was carried out to determine the feasibility of using Geographic Information Systems (GIS) to support both implementation and monitoring of SIAs. GIS is a tool that captures, stores, analyses and presents data linked to location. In Nigeria, it helped track and map the movements of vaccination teams in relation to prepared microplans. Analysis of the real-time data allowed for the immediate identification of missed areas, which were subsequently re-visited by the teams. Following further assessment, the use of this methodology may be expanded in 2011.

Polio survivors not left stranded by eradication efforts

The year 2010 marked the year that the arguments for 'control' of polio versus 'eradication' were put to rest, as explosive outbreaks in Tajikistan and the Republic of the Congo drove home the urgent need to completely eradicate this virus or risk massive outbreaks with regular occurrence in even the most unexpected places in the future.

The outbreaks in Tajikistan and the Republic of the Congo were particularly deadly, with a case fatality rate of more than 30% in the latter. While eradication is the ultimate protection from polio, manifestly much more needs to be done to support surviving polio victims.

Due to the sudden increase in number and severity of paralytic cases overwhelming national capacities in the central Asian and Congo outbreaks, WHO professionals in disability and rehabilitation and NGOs worked as part of the response to the polio outbreak to assess national capacity for acute respiratory support and rehabilitation and establish rehabilitation programmes for the large number of victims. In the Republic of the Congo, a special team of the Global Initiative of Emergency and Essential Surgical Care of WHO was dispatched in November to help support a humanitarian response to the outbreak, with a clear mandate to reduce the associated mortality. Special units were set up to provide ventilation care to critically ill patients with respiratory failure. Such collaboration will facilitate standard operating procedures for a response to acute polio outbreaks and guidelines on improving access to rehabilitation services for polio survivors.