The World Health Organization

The Case for Completing Polio Eradication

'As an international community, we have few opportunities to do something that is unquestionably good for every country and every child, in perpetuity.'

Dr Margaret Chan
Director-General
World Health Organization

The Issue

Without an urgent infusion of international funds, the opportunity to complete polio eradication could be lost forever…

By July 2007 the Global Polio Eradication Initiative (GPEI) will have a negative cash flow, which if not addressed will require an immediate reduction in planned polio eradication activities in the remaining infected countries[1]. Even a temporary cutback would result in the reinfection of polio-free areas, delays in outbreak response, a surge in polio-paralyzed children and an increase in overall costs. Insufficient funds at this late stage imperil the entire 20-year eradication effort, as well as related gains in routine childhood immunization, global communicable disease control, preparedness and response, and other child survival and international health activities.

The following 'case statement' was developed following an 'Urgent Stakeholder Consultation on Polio Eradication' convened by the Director-General of the World Health Organization (WHO) on 28 February 2007 at the WHO Headquarters in Geneva, Switzerland. The list of participants, agenda, presentations and other related materials from the Consultation are available at www.polioeradication.org.

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[1] At 10 May 2007, 4 countries had yet to stop indigenous poliovirus (i.e. 'endemic' countries: Afghanistan, India, Nigeria, Pakistan); 6 of the 26 countries reinfected since 2003 by virus that originated in an endemic country had not yet stopped transmission again (i.e. Angola, Bangladesh, Democratic Republic of the Congo, Ethiopia, Myanmar, Somalia); 4 additional countries that border 'endemic' areas continue to suffer sporadic importations (i.e. Cameroun, Chad, Nepal, Niger).

The Context

In 1988, over 350 000 children were being paralyzed by polio every year...

Despite the availability of an effective, cheap, oral polio vaccine (OPV) for more than 25 years, over 350 000 children in at least 125 countries were still being permanently paralyzed by wild polioviruses[2] each year when the Global Polio Eradication Initiative (GPEI) was launched in 1988.

By 1999, the GPEI had reduced annual polio cases by 99% and proven the feasibility of eradication...

The technical feasibility of eradicating wild-type poliovirus was confirmed in October 1999 when the last case of paralytic polio due to wild poliovirus type 2 (1 of 3 types) was detected anywhere in the world. By 2002, the feasibility of eradication was reaffirmed by certification of eradication of all 3 wild poliovirus types in 3 of the 6 WHO Regions.

In 2003, limited cutbacks in eradication activities led to a huge resurgence of polio...

In mid-2003 two northern Nigeria states that were heavily infected with polio unexpectedly suspended OPV use (stating it might be 'contaminated'), leading to a national epidemic[3]. This occurred shortly after the GPEI shifted tactics, in part due to limited financing, stopping campaigns in most polio-free areas of Africa, Asia and the Middle East to focus resources on endemic countries. Since 2003, 20 polio-free countries in these areas have suffered new outbreaks following importations of a poliovirus from Nigeria while virus originating in India re-infected another 6 countries. In total, thousands of children in polio-free areas were paralyzed, requiring the additional expenditure of over US$ 450 million for emergency response activities.

In 2006, 4 countries still had indigenous poliovirus, prompting some to propose that eradication be abandoned...

Citing the high costs of completing polio eradication relative to the low number of remaining cases, and suggesting the last 4 endemic countries and some re-infected countries could not fully implement the strategies, some public health officials proposed the eradication goal be abandoned for one of 'effective control'. This proposal was made amid increasing international awareness and discussion of other risks, such as the fatigue of health workers and volunteers after years of campaigns, historical gaps in surveillance quality and competing development priorities.

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[2] 'Wild' denotes naturally occurring polioviruses which circulate(d) among humans. 'Sabin-strain' denotes the attenuated polioviruses that are used to make oral poliovirus vaccine (OPV).

[3] Centers for Disease Control and Prevention. Resurgence of wild poliovirus type 1 transmission and consequences of importation into 21 previously polio-free countries, 2002-2005. *Morbidity and Mortality Weekly Report* 2006; 55: 145-50.

The Case for Completing Polio Eradication

A new study shows switching to polio 'control' would actually cost more than completing eradication...

Advocates of 'effective control' (which they define as maintaining <500 polio cases/year indefinitely) predicted this could be achieved at lower costs than completing eradication[4]. However, an independent analysis found that 'effective control' would actually result in a much higher burden of disease and at costs that would exceed, by billions of dollars over a 20-year period, those of completing eradication[5].

New analyses confirm that returning to routine immunization alone for polio control would result in over 200 000 children again paralyzed by polio each year...

The international spread of polio from Nigeria in 2003 showed that the number of cases could increase very rapidly if eradication were not completed[3]. New mathematical models found that regardless of the control strategy, in low-income countries alone a switch to 'control' would result in up to 4 million polio-paralyzed children over the next 20 years[5]. This increase in polio would disproportionately affect poor populations, with the vast majority of cases occurring in countries with a GDP of < US$ 1000/person/year.

New tools greatly enhance the impact of the eradication strategies[6]...

A recent study confirms that new polio vaccines ('monovalent OPVs' or 'mOPVs'), developed by an extraordinary public-private partnership in 2005-6, substantially enhance the impact of polio campaigns[7]. Dose for dose, these vaccines more than double a child's protection against the specific type of polio present in a country, as compared with the traditional trivalent OPV. GPEI is also assessing the potential role of inactivated polio vaccine (IPV) in case polio is found to persist in an area with very high mOPV coverage.

New measures are reducing the risk and consequences of new outbreaks in polio-free areas...

Since the World Health Assembly in 2006 endorsed faster, larger and more sustained polio outbreak responses, only 6% of new cases have been due to importations, compared with 52% in 2005. The speed of outbreak response activities has been

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[4] Arita I. Public health. Is polio eradication realistic? *Science* 2006; 312(5775): 852-4.

[5] Thompson KM, Tebbens RJ. Eradication versus control for poliomyelitis: an economic analysis. *Lancet*. 2007; 369(9570): 1363-71.

[6] GPEI's 4-pronged strategy (routine immunization, National Polio Immunization Days (NIDs), acute flaccid paralysis (AFP) surveillance, and 'mop-ups') used trivalent oral poliovirus vaccine (tOPV).

[7] Grassly NC. Protective efficacy of a monovalent oral type 1 poliovirus vaccine: a case-control study. *Lancet*. 2007; 369(9570): 1356-62.

further enhanced by new laboratory methods introduced in late 2006 to reduce by 50% the time needed to confirm polio infections and, since 2005, a doubling of surveillance sensitivity performance targets in all high-risk countries.

New tactics are tailored to address the specific challenges in the last 4 endemic countries...

By late 2006, 'Immunization Plus Days' (IPDs) in Nigeria were combining mOPV with other interventions, substantially increasing routine immunization coverage, community acceptance and political support. In India, a new accelerated mOPV campaign schedule is boosting young child immunity more rapidly than in 2006. In Pakistan and Afghanistan, a new, multi-pronged approach includes cross-border synchronization of campaigns, tracking of nomad populations and negotiating access with local leaders and military forces. In all 4 countries, religious and traditional leaders have substantially increased their role to better engage local communities.

In the last 4 endemic countries, the Head of Government is now directly engaged in completing eradication ...

On 28 February 2007, the Heads of Government of Afghanistan, India, Nigeria and Pakistan sent personal envoys to lead their delegations to the Director-General's *Urgent Stakeholder Consultation on Polio Eradication* at WHO, Geneva. This level of government can marshal cross-ministerial, cross-sectoral support for new tactics to reach every child in each infected area. In 2 of the 4 countries the impact of this support is already evident in new pledges totalling US$ 311 million in domestic financing for polio activities.

Completing eradication will benefit the Millennium Development Goals (MDGs)...

The investment in GPEI pays major dividends beyond preventing 5 million polio cases to date. Over 85% of the fulltime GPEI staff (approximately 3 400 people at 1 May 2007) work on other disease control activities for an average of 50% of their time. This GPEI investment has helped avert 1.25 million deaths through Vitamin A supplementation and 2.3 million deaths through measles mortality reduction activities[8]; boost routine immunization and introduce new vaccines in GAVI-eligible countries; respond to international health emergencies such as SARS and Avian Influenza[9]; and facilitate a rapid response to humanitarian crises such as the South Asia Tsunami in 2004 and the Pakistan earthquake in 2005. Further investing in eradication will facilitate the continued integration of the GPEI's infrastructure and operations with other activities, and prevent the harmful consequences of an inadvertent collapse in GPEI support.

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[8] Wolfson LJ. Measles Initiative. Has the 2005 measles mortality reduction goal been achieved? A natural history modelling study. *Lancet* 2007; 369(9557): 191-200.

[9] Heymann DL, Aylward RB. Poliomyelitis eradication and pandemic influenza. *Lancet* 2006; 367(9521): 1462-4.

Immediate Actions to Intensify Polio Eradication Efforts (within 6 months)

Exploiting the new tools, tactics and commitments to accelerate polio eradication during 2007-8 requires immediate action by all GPEI stakeholders. For endemic countries, the priority is to increase the number of children vaccinated with the new mOPVs in each polio-infected district during each campaign. At the international level, the focus is on ensuring the GPEI has the financing and political support needed to implement polio campaigns and surveillance of the highest possible quality.

National activities (polio-endemic countries)

1. *Polio Eradication as a National Priority:* a government mechanism will be established at national and state/province levels to coordinate cross-ministerial and cross-sectoral inputs regularly (at least every 2 months) and report to the head of government. 'Polio officers' will implement the decisions of these bodies, with overall responsibility for performance in their area.

2. *Social Mobilization & Communications:* a national-international review will develop a comprehensive plan of action to engage communities in infected districts, optimize mass media use, increase the role of local influencers and proactively deal with rumours. Standard indicators will be analyzed during each campaign, with a revision of the plan if appropriate.

3. *Campaign Quality & Monitoring:* to reach >95% of children in infected districts, microplans will be redone to international standards with all areas mapped and assigned to vaccinators acceptable to the community; local organizations and NGOs will be engaged, especially religious and women's groups. Independent teams will monitor campaigns in high-risk areas[10] and report to the national polio technical advisory body. In infected districts, areas achieving <90% coverage will be revisited and revaccinated.

4. *Routine Immunization:* coverage targets will be established for polio-infected districts and, with key process indicators[11], included in data reviewed during each meeting of national technical advisory body.

5. *Research & Introduction of New Tools:* research to guide activities (e.g. serosurveys, IPV studies, pilots of new interventions) will be identified by technical advisory bodies and addressed within 6 months. New tools will be rapidly introduced (e.g. by licensing at least 2 of each mOPV1 and mOPV3).

6. *Domestic Financing:* 3-year eradication budgets will be established or updated, domestic financing will be finalized, and a high-level national Interagency Coordinating Committee (ICC) meeting will be convened 2 times per year with development partners and the Ministry of Finance to discuss or clarify domestic financing.

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[10] Highest risk areas for missing children during polio campaigns, as identified by a high burden of disease, a high proportion of 'never vaccinated children', historically poor campaign performance, etc.

[11] Key process indicators may include the proportion of routine immunization positions that are vacant, routine immunization sessions conducted and vaccine stockouts.

International activities (donors and partner agencies)

1. *International Financing:* development partners will include the *'Case for Completing Polio Eradication'* in G8 meetings, meetings of the OECD-DAC, the World Bank Development Committee, the Organization of Islamic Conference (OIC) and Boards of the Global Alliance for Vaccines and Immunization (GAVI).

2. *International Advocacy:* the Director-General of WHO will travel to each of the 4 endemic countries to discuss the intensified eradication effort with the Head of Government. The *'Case for Completing Polio Eradication'* will also be brought to the attention of the political leaders and organizations that support the GPEI, through the summits of the G8, the Organization of Islamic Conference (OIC), the African Union, the South Asian Association for Regional Cooperation (SAARC) and the Commonwealth.

3. *Enhancing the Safety of Polio Workers & Volunteers:* WHO, UNICEF and relevant international stakeholders will assist national efforts to advocate for Days of Tranquillity and/or other mechanisms to ensure the safe passage of vaccinators to reach all children in insecure areas and areas of active conflict.

4. *International Coordination of Campaigns:* WHO and UNICEF will assist countries to synchronize campaigns where this is needed to optimize coverage of moving populations (e.g. Afghanistan/Pakistan, India/Nepal, Nigeria/Niger).

5. *Limiting International Spread of Polio:* WHO and UNICEF will assist reinfected countries to implement rapid responses to polio outbreaks. WHO will also assist in updating national immunization policy to reduce the risk of polio importations.

Milestones for an Intensified Polio Eradication Effort

Progress towards the following milestones will demonstrate whether the 'immediate actions for an intensified eradication effort' are being implemented and achieving the expected impact on stopping polio transmission in endemic and reinfected countries.

1. Endemic Countries: Reduction in Polio-Infected Districts

   - by end-2007 there should be a 50% reduction in the number of polio-infected districts relative to 2006.

   - by end-2008 polio transmission should be interrupted *or* there should be at least a further 50% reduction in the number of infected districts relative to 2007.

2. Endemic Countries: Increase in Protection Against Polio in Infected Districts[12]

   - by end-2007 the level of immunity against polio among children aged 6-35 months in infected districts should be at least at the level in polio-free districts.

   - by end-2008 the level of polio immunity among children aged 6-35 months in infected districts should have been at least as high as in polio-free districts, for at least 12 months.

3. Reinfected Countries: Rapid Cessation of New Polio Outbreaks

   - by end-2007, countries reinfected in 2006 will have implemented appropriate response activities[13] and interrupted transmission of the imported poliovirus.

   - by end-2008, any country reinfected in 2007 will have implemented response activities and interrupted transmission of the imported poliovirus.

4. International Stakeholders: Closure of the Financing Gap[14]

   - by mid-2007 sufficient funding will have been pledged to finance all eradication activities planned through end-2007.

   - by end-2007 sufficient funding will have been pledged to finance all eradication activities planned through end-2008.

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[12] Measured by the vaccination status of non-polio acute flaccid paralysis (AFP) cases aged 6-35 months and, if appropriate, adjusted for differences in vaccine efficacy compared with polio-free areas.

[13] World Health Assembly Resolution WHA59.1.

[14] As outlined in the relevant edition of the Financial Resource Requirements of the Global Polio Eradication Initiative (FRRs) at www.polioeradication.org.

Monitoring the Intensified Polio Eradication Effort

Stakeholders can monitor progress towards the milestones and activities of the intensified eradication effort on the GPEI website www.polioeradication.org, and in GPEI publications (e.g. PolioNews and the GPEI Annual Report).

In each endemic country, activities will be monitored and guided every 4-6 months by the polio technical advisory body (the Expert Review Committee (ERC) in Nigeria; the Technical Advisory Group (TAG) in Afghanistan and Pakistan; and the India Expert Advisory Group (IEAG)). At the international level, activities will be monitored by the Advisory Committee on Polio Eradication (ACPE) every 6 months (with a face-to-face meeting every 12 months) and by regional advisory committees each year.

The findings of the technical advisory bodies will be posted on the GPEI website within 10 days of each meeting and will be reflected in the annual reports of the Secretariat to the World Health Assembly. Follow-up stakeholder consultations will be convened every 12 months.

A Call to Action to Finance an Intensified Eradication Effort, 2007-8

Implementing the 'immediate actions' to intensify the GPEI requires a rapid injection of multi-year flexible funding, without which the opportunity to eradicate polio will be lost. As of 10 May 2007, the GPEI had a funding gap of US$ 540 million for 2007-8. Activities and staff will have to be cut back as early as July 2007 if US$ 100 million of the funding gap is not secured by that time. A further US$ 100 million of the funding gap requirement is needed by November 2007.

Summary of external financing required by major category of expenditure, 2007-8 (US$ millions)[15]

Major Expenditures	2007	2008	2007-2008
Oral polio vaccine	$ 227.98	$ 176.09	$ 404.07
Campaign operations	$ 230.69	$ 163.81	$ 394.50
Outbreak response/ mOPV evaluation	$ 50.00	$ 35.00	$ 85.00
Surveillance	$ 61.09	$ 59.47	$ 120.56
Laboratory	$ 8.37	$ 8.45	$ 16.82
Technical assistance	$ 87.90	$ 83.35	$ 171.25
Certification and containment	$ 12.00	$ 12.00	$ 24.00
Products for the post-eradication era	$ 5.00	$ 5.00	$ 10.00
Vaccine for post-eradication stockpile	$ 12.70	$ 31.60	$ 44.30
Subtotal	**$ 695.72**	**$ 574.77**	**$ 1,270.50**
Contributions	$ 493.80	$ 237.73	$ 731.53
Funding gap	**$ 201.92**	**$ 337.04**	**$ 538.97**

Budget notes:

- conducting additional campaigns to raise immunity in polio-free countries at moderate risk of importations would cost an additional US$ 110 million per year.
- a 12-month delay in completing eradication in the Pakistan/Afghanistan reservoirs, Nigeria or India would increase costs by a minimum of US$ 45 million, US$ 80 million and US$ 140 million, respectively.
- after interrupting wild poliovirus transmission globally, US$ 661 million will be required over the next 3 years for certification and post-eradication preparedness.

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[15] Details can be found in the Financial Resource Requirements of the Global Polio Eradication Initiative (FRRs) at www.polioeradication.org .