Global eradication of poliomyelitis


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Abbreviations

AFP  acute flaccid paralysis  
AFRO  WHO Regional Office for Africa  
AMRO  WHO Regional Office for the Americas  
CDC  Centers for Disease Control and Prevention (US)  
DANIDA  Danish International Development Agency  
DFID/UK  Department for International Development, United Kingdom  
EMRO  WHO Regional Office for the Eastern Mediterranean  
EPI  Expanded Programme on Immunization  
EURO  WHO Regional Office for Europe  
GPV  WHO Global Programme on Vaccines and Immunization  
HIV  human immunodeficiency virus  
HRRI  high-risk response immunization  
ICC  Interagency Coordination Committee  
IPV  inactivated polio vaccine  
MO  medical officer  
MOH  ministry of health  
NID  national immunization day  
OPV  oral polio vaccine  
PV  polio virus  
SEARO  WHO Regional Office for South-East Asia  
SNID  sub-national immunization day  
TCG  Technical Consultation on Global Eradication of Poliomyelitis  
UN  United Nations  
UNICEF  United Nations Children’s Fund  
USAID  United States Agency for International Development  
VRD  Vaccine Research and Development (WHO)  
VVM  vaccine vial monitor  
WHA  World Health Assembly  
WHO  World Health Organization  
WPRO  WHO Regional Office for the Western Pacific
1. Introduction

From 7–8 July 1998, the third Technical Consultation on Global Eradication of Poliomyelitis Technical Consultative Group (TCG) was convened by the World Health Organization. The TCG met to review the currently recommended strategies for the global goal of eradication of poliomyelitis by the year 2000.

The meeting was opened by Dr B. Melgaard, Chief, Expanded Programme on Immunization (EPI). In welcoming the participants, he emphasized the importance of the consultation as it facilitates an in-depth discussion of technical aspects of the polio eradication initiative. Dr Melgaard described the importance of the task the TCG had, adding that the agenda before them was a reflection of the progress that had been made since the last meeting of the TCG in 1997. Dr Melgaard referred to the need to improve surveillance for acute flaccid paralysis (AFP) and options that may be available for this. He also called on the TCG to deliberate in detail on the challenge of accelerating the eradication initiative in the major global reservoirs and countries in conflict. Dr Melgaard asked the TCG to provide recommendations on development of the strategy for discontinuation of poliomyelitis vaccination once eradication has been achieved.

Dr W. Orenstein of the Centers for Disease Control and Prevention of the United States of America served as chairman of the meeting with Dr P. Figueroa of the Ministry of Health, Jamaica as rapporteur. This report presents an update on the progress and priority activities for the eradication initiative and summarizes the technical deliberations of the third Technical Consultative Group meeting. The recommendations follow each section.
2. Global overview, priorities and inter-regional coordination

2.1 Status and timeline of the polio eradication initiative

Since the 1997 meeting of the TCG, there have been significant achievements in the implementation of the principle strategies for global eradication of poliomyelitis. Although global coverage for oral polio vaccination-3 (OPV-3) has remained stable at 81%, during 1997, approximately 450 million children less than five years of age were immunized during national immunization days in 80 countries. As of April 1998, national immunization days (NIDs) have been conducted in every polio-endemic country, including all recently or currently endemic countries in Europe and Asia, with only four exceptions (the Democratic Republic of Congo, Liberia, Sierra Leone and Somalia. A cute flaccid paralysis (AFP) surveillance, the third strategy for polio eradication, has now been established in countries in difficult circumstances, such as Afghanistan and many sub-Saharan African countries. There has been a rapid acceleration of AFP surveillance in some of the major global reservoirs of poliovirus (India and Nigeria). The status of probable or known wild poliovirus transmission is presented in Figure 1. These areas include sub-Saharan Africa (West and central Africa), the Horn of Africa, and South-East Asia.

**Figure 1: Global polio situation, 1998**
These areas are characterized by the following features: a) large birth cohorts with low immunization coverage for OPV, leading to efficient transmission of wild poliovirus, b) high population densities, poor sanitation and high migration rates and c) virologic evidence of persistent wild poliovirus type 2 circulation.

2.2 Priorities for global eradication of poliomyelitis

To achieve eradication in the key countries, the priorities were presented and a proposed timeline for the global eradication of poliomyelitis was also reviewed by the TCG:

1) Conducting additional NIDs and sub-national immunization days (SNIDs) rounds in 1999 and the posting of dedicated surveillance personnel in the major reservoir countries and strengthening of routine EPI.

2) In countries affected by conflict, formation of ‘eradication teams’, to conduct supplementary immunizations (NIDs and campaigns including measles and vitamin A), and establish alternative supplemental surveillance for AFP.

3) In the remaining recently endemic countries, allocation of surveillance and mopping-up personnel to conduct supplementary activities to eliminate the final chains of transmission of wild viruses.

4) Advocacy for full funding of eradication activities, increasing the WHO leadership role and capacity, and strengthening of the Regional Offices.

Figure 2: Timeline for the global eradication of poliomyelitis
The TCG noted that high quality routine OPV immunization at the district level is a critical component of the WHO polio eradication strategy. In addition, the implementation of supplementary immunization activities for polio eradication provides excellent opportunities for the strengthening of routine immunization services. Such benefits, however, require planning and a concerted effort to exploit these opportunities. The TCG is concerned that immunization coverage estimates in many critical countries are inaccurate, usually substantially overestimating routine immunization levels.

Recommendations

1) National Interagency Coordination Committees (ICCs) should review the status of routine EPI, discuss strategies for improvement and review action plans.

2) In those countries where there are substantial discrepancies between administrative reports of routine immunization coverage and other estimates (e.g. surveys), an assessment should be conducted to identify and correct systematic errors in the calculation of coverage.

3) The data collected in the course of planning and implementing NIDs should be used to systematically identify unreached and under-served populations for routine immunization.

4) Social mobilization opportunities provided by NIDs should be used to promote routine immunization services, both by heightening public awareness in general, and by directing parents to the nearest health facilities to complete the immunization series.

5) WHO, national governments and partner agencies should continue to use the opportunities provided by funding and implementation of NIDs to revitalize routine immunization infrastructure, particularly the cold chain and transportation.
3. Interrupting polio transmission in the global reservoirs

Wild poliovirus transmission is now concentrated in South Asia and sub-Saharan Africa. Transmission appears most intense in three specific areas composed of densely populated countries: South Asia (Bangladesh, India, Nepal, Pakistan), West and Central Africa (especially Democratic Republic of the Congo and Nigeria) and the Horn of Africa (Ethiopia, Somalia, Sudan). The recent isolation of poliovirus type 2 in a number of these countries demonstrates the presence of large susceptible populations (due to low routine immunization coverage) and widespread polio transmission (due to poor sanitation). These countries not only represent the majority of cases in the world but also risk reseeding neighbouring countries and inhibiting progress there. Given the size of the birth cohorts that accumulate between NIDs and the poor routine coverage, stopping transmission will require accelerated supplementary immunization. An update of the status of polio eradication in the remaining global reservoirs was presented to the TCG.

3.1 South Asia and the Eastern Mediterranean Region

The largest global reservoir of wild poliovirus exists in the block of South Asian countries that includes Afghanistan, Bangladesh, India, Nepal and Pakistan. Countries immediately east of this block, Myanmar, Thailand and Indonesia are on the verge of eradicating polio, but will require additional support because of economic crises and difficulties in reaching certain border areas (such as between Thailand and Myanmar). In all these countries, reported coverage during NIDs has been high but pockets of high-risk children are being missed during the supplementary campaigns.

AFP surveillance has rapidly improved in Afghanistan, India and Pakistan. Despite large areas of these countries being affected by natural disasters and civil unrest, Afghanistan has achieved a high standard of AFP surveillance. In India, the annualised non-polio AFP rate during the first half of 1998 was 0.43 per 100,000 population aged under 15 years compared to 0.03 in 1996. However, in Bangladesh and Nepal, the development of AFP surveillance has been less rapid.

As well as accelerating the existing polio eradication strategies in these countries, it will be critical to conduct additional widespread supplementary immunization rounds, until AFP surveillance is good enough to accurately target mopping-up immunization to eliminate the remaining chains of wild virus transmission.
3.2 West and Central Africa

Despite progress in conducting supplementary OPV immunization activities in Africa in 1997, reported routine coverage for OPV still remains low in the region. Of the four largest, epidemiologically important countries (Angola, Democratic Republic of Congo, Ethiopia, and Nigeria), coverage remains low (42%, 36%, 67%, 26%). Nigeria and the Democratic Republic of Congo are the two most important remaining reservoirs of wild poliovirus, each present major challenges for reaching the target of eradication in Africa. Surveillance data and genomic sequencing of viruses isolated from these countries indicates that they serve as reservoirs exporting wild poliovirus to neighbouring countries. In other West African countries (Côte d’Ivoire, Burkina Faso, Benin), both wild poliovirus type 1 and 2 have been identified despite reported high coverage during NIDs in 1997 and 1998. This finding indicates that wild poliovirus transmission still persists in the sub-region. The overall OPV-3 coverage in the region still averaged only 57% in West Africa and 39% in Central Africa.

The major challenges in West and Central Africa include, (a) improving the capacity for routine immunization, (b) conducting supplementary immunization activities through the year 2000, with extra rounds of NIDs in poorly performing states, (c) making AFP surveillance fully operational in the sub-regions by the end of 1999, and (d) supporting the rehabilitation of infrastructure for routine EPI services.

3.3 Horn of Africa

The countries in the Horn of Africa (Djibouti, Eritrea, Ethiopia, Somalia, Sudan) are characterized by poor or non-existent infrastructure, armed conflict, complex emergencies, frequent famine, epidemics, difficult terrain and nomadic and refugee populations. During 1996, 1997 and early 1998, these countries began implementing polio eradication strategies. NIDs were conducted in Djibouti, Ethiopia, North Sudan and Eritrea. Sub-national immunization days (SNIDs) were conducted in Somalia and recently in early 1998; successful campaigns were conducted in South Sudan, representing the first ever health intervention to cover the whole of South Sudan, reaching children who had never been reached before. The campaign also demonstrated the innovative use of the vaccine-vial monitors (VVMs), by using the “fast chain”, allowing the vaccination teams to reach remote and distant areas by stretching the cold chain. These successful immunization campaigns showed that polio eradication in the Horn of Africa is technically and operationally feasible. The remaining challenge is to accelerate the supplementary activities and establish AFP surveillance.

Recommendations:

1) WHO and partner agencies must focus their technical, political and financial support on the acceleration of eradication activities in the countries that constitute the global reservoirs.

2) Comprehensive country plans covering all components of the WHO-recommended polio eradication strategy should be developed by the end of 1998 for the global-reservoir countries, areas affected by conflict and other countries which are vulnerable to continued wild poliovirus circulation. These plans should be based on an in-depth analysis of the epidemiology and status of polio eradication activities and explicitly state the activities, resource requirements
and timeline for accelerating the initiative in that country. The development of these plans will require substantial technical assistance from WHO and other technical partners.

3) The highest priority for interrupting polio transmission is ensuring that the two rounds of NIDs each year in the countries of the major global reservoirs are of the highest possible quality. In those areas of a country where there is a high risk of ongoing poliovirus circulation and/or poor NIDs performance in the past, the NIDs rounds should be implemented on a house-to-house basis. This will require extensive resources, technical support and detailed planning.

4) During NIDs rounds, ministries of health should use practical management tools to rapidly evaluate and improve their quality. In those areas which are missed or insufficiently covered during one or both rounds of the NIDs, additional immunization activities should be immediately implemented (e.g. going on a house-to-house basis or using mobile teams) to reach previously unimmunized children, without waiting for the next NIDs.

5) The TCG is concerned that a number of countries have planned to prematurely stop NIDs while wild poliovirus continues to circulate within their borders. NIDs should be continued even if there is documentation that poliovirus transmission in that country has been interrupted if it continues to circulate in nearby countries.

6) As a matter of urgency, additional supplementary immunization activities must be conducted in the global reservoir countries. These activities can include sub-national immunization campaigns, house-to-house mopping-up immunization in high-risk areas and catch-up immunization campaigns.

7) The opportunities provided by NIDs and other supplementary immunization activities should be used to improve the delivery of routine immunization services (see section on routine immunization).
4. Mopping-up campaigns

Mopping-up campaigns are the fourth strategy for eradication of poliomyelitis. The activity has the objective of eliminating the final chains of transmission of poliovirus in a country. The TCG was presented an overview of the experience of conducting mopping-up campaigns in the Western Pacific Region of WHO. In this region, the term “high risk response immunization” (HRRI) is used.

4.1 High-risk response immunization

The term high-risk response immunization describes focussed supplementary immunization activities conducted in addition to NIDs. The term “mopping-up” has been used in other WHO regions. HRRI differ from NIDs or SNIDs in the following ways: (a) they are conducted during the period when there is easy access to the target population or targeted area, not necessarily during the low enterovirus transmission season, (b) they are focal, confined to known high-risk areas for wild poliovirus transmission, (c) they are intense, require more resources per child reached, require more staff, more supervision and are conducted on a house-to-house or boat-to-boat basis and, (d) they can take longer to conduct than NIDs.

The HRRI strategy has been used to eliminate the last chains of transmission in the Western Pacific Region of WHO. In Indo China, routine coverage was high in Viet Nam and below 30% in both Cambodia and Laos. Despite repeated NIDs between 1993 and 1995 that achieved high coverage, wild poliovirus transmission persisted in the Mekong River delta. The Mekong River area of Cambodia and Viet Nam remained the last focus of wild poliovirus circulation in the Western Pacific. In 1996, 18 wild poliovirus- associated cases were reported from this area and in 1997, up to March, a further eight cases were reported, despite three NIDs having been conducted. In previous years wild polio virus had spread from the Mekong to other parts of the country by the middle of the year. To arrest further transmission, it was decided that additional rounds of supplementary immunization would be needed in this area in mid-1997. The first HRRI consisted of two rounds in high-risk areas of Cambodia, Laos and Viet Nam for over two million children under five years in May and June 1997. The second HRRI consisted of two rounds in high-risk areas of Cambodia and Viet Nam for over two million children under five years in March and April 1998. Therefore, from November 1996 to April 1998, a total of eight rounds of supplementary immunization were conducted for over two million children in high-risk districts of the Mekong River area, four rounds were from NIDs and another four rounds from HRRI. The extra teams, supervisors and increased duration raised the relative cost of HRRI compared with NIDs. In Cambodia, the cost was
approximately 20% higher per child immunized. As a result of HRRI and NIDs, no new cases of poliomyelitis have been reported in the Western Pacific Region since March 1997, under conditions of high quality surveillance.

4.2 Lessons learnt from the HRRI

The key lessons learnt from the high-risk response immunization activities conducted in the Western Pacific Region during 1996-1998 include:

a) **High quality AFP and virological surveillance is essential**: Only timely and complete AFP and laboratory surveillance provided the information needed to select areas where wild poliovirus could continue to circulate. Ideally, in order to plan an effective HRRI, it is recommended that AFP surveillance should reach a non-polio AFP rate approaching one case per 100,000 population under 15 years, a high proportion of AFP cases with two stool samples taken within 14 days of onset of paralysis and timely laboratory results.

b) **Use surveillance indicators to select high-risk areas**: A number of criteria can be used to select areas for conducting HRRI. These could include wild poliovirus circulation in the past 12 to 24 months, clusters of polio-compatible cases, areas with national borders with endemic countries that have major crossing points, poor surveillance performance and low immunization coverage (routine or NID).

c) **Access to high-risk populations is more important than seasonal epidemiology of poliovirus**: In selecting the time to do HRRI, consideration should be given to social and logistical convenience. Consider the weather and agricultural activities and whether mothers and children are likely to be at home at the time. Adequate time is required for planning. In the Western Pacific, HRRI were effective despite being conducted in the hottest time of the year.

d) **Establish a flexible mixture of strategies and close supervision of activities**: Once an area has been selected, every child in that area must be targeted through a combination of fixed posts, moveable posts, and mobile teams that visit house-to-house and boat-to-boat. Strategies should vary according to the area and there must be detailed planning and close supervision during the implementation.

e) **Coverage result calculations cannot be used to monitor and evaluate HRRI**: In many high-risk areas the population denominator may be unknown. The absolute numbers of children immunized should be collected. Monitoring should be carried out by supervisors collecting data on the numbers of children immunized by each team or post, and other simple indicators such as the percentage of children who are previously zero-dose. Post-HRRI immunization surveys are expensive and unlikely to provide more useful data. The most reliable evaluation is by maintaining high quality AFP and virological surveillance in the area.

Table 1 presents guidelines for conducting HRRI based on the experience from the Western Pacific Region.
Table 1: Guidelines for high risk response immunization

<table>
<thead>
<tr>
<th>Wild poliovirus isolated</th>
<th>Latest wild poliovirus identified &lt;12 months ago</th>
<th>Latest wild poliovirus identified &gt;12 months and &lt;3 years ago</th>
<th>Latest wild poliovirus identified &gt;3 years ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-risk countries¹</td>
<td>Immediate response At least one province 2 rounds of OPV</td>
<td>Immediate response At least one province 2 rounds of OPV</td>
<td>Immediate response At least one province 2 rounds of OPV</td>
</tr>
<tr>
<td>Intermediate-risk countries¹</td>
<td>Immediate response Multiple districts 2 rounds of OPV</td>
<td>Intermediate response Multiple districts 2 rounds of OPV</td>
<td>Convenient response Multiple districts 2 rounds of OPV</td>
</tr>
<tr>
<td>Low-risk countries¹</td>
<td>Immediate response</td>
<td>Intermediate response</td>
<td>Convenient response</td>
</tr>
<tr>
<td>Cluster of high-risk AFP cases</td>
<td>Immediate response² Multiple districts 2 rounds of OPV</td>
<td>Intermediate response³ Multiple districts 2 rounds of OPV</td>
<td>Convenient response² Multiple districts 2 rounds of OPV</td>
</tr>
<tr>
<td>High-risk area or Cluster of higher-risk polio compatible cases</td>
<td>Intermediate response² Multiple districts 2 rounds of OPV</td>
<td>Convenient response² Multiple districts 2 rounds of OPV</td>
<td>Convenient response² Multiple districts 2 rounds of OPV</td>
</tr>
</tbody>
</table>

¹ Or regions/provinces in a country.
² Carry out before stool results are known.
³ Carry out within a few months.
⁴ Carry out at earliest convenience: possibly during next SNID/NID.

Recommendations

1) Immunization coverage data alone should not be the basis for planning and implementing mopping-up activities. All epidemiological information and programmatic information, particularly information on reported polio cases, should be used to guide the selection of areas for extensive house-to-house immunization efforts. Implementation of mopping-up activities should not await establishment of the surveillance performance needed for certification.

2) Successful mopping-up activities require extensive planning and additional resources, both financial and technical. In contrast to NIDs and because of the need to deliver house-to-house immunization to large populations, implementation of this activity requires intensive efforts that may take several days or weeks.
5. Acute flaccid paralysis surveillance

AFP surveillance systems are functioning at a high standard in most recently endemic countries of the Americas, Europe and the Western Pacific. In most of Africa, AFP surveillance is still in the early stages and an extensive plan of action has been developed for the acceleration of the activity. Dramatic improvements in surveillance have been achieved in the South-East Asia Region since the last TCG. These improvements largely reflect the infusion of substantial external resources into these countries (particularly India) allowing the placement of long-term designated surveillance personnel with sufficient communication and transport. Lastly, while high quality surveillance has been achieved in much of the Eastern Mediterranean, the capacity to establish functional surveillance in a number of areas that are severely affected by conflict has been questioned, particularly where there is no government structure (e.g. South Sudan, South Somalia).

The TCG was updated on the status of AFP surveillance and the proposal for acceleration of activities in the African and South-East Asia Regions.

5.1 Acceleration of AFP surveillance in the African Region

By 1997, surveillance for acute flaccid paralysis had been established in all but six countries in the Region (Burundi, Equatorial Guinea, Eritrea, Gabon, Liberia and Sierra Leone). The rate of AFP reporting for all epidemiologic blocks is still low (average less than 0.2 non-polioomyelitis AFP cases per 100,000 children less than 15 years of age). Even in the larger countries which report higher rates of non-polioomyelitis AFP (Ghana, Uganda, Zimbabwe) the geographical distribution of AFP cases with two specimens collected within 14 days of onset of paralysis remains inadequate. In 1997, stool specimens collected from 73 AFP cases in East African countries (Kenya, United Republic of Tanzania, Uganda and Zambia) were found negative for wild poliovirus. No wild poliovirus was recovered in continental Southern Africa. On the other hand, wild poliovirus was isolated from a total of 33 AFP cases from the Democratic Republic of Congo and many countries in Central and West Africa. The performance of AFP surveillance in the region, although improving, remains at low levels. Table 2 presents the overall AFP rates by epidemiologic block.
Table 2: AFP Rates by epidemiologic block in the African Region, 1997 and 1998

<table>
<thead>
<tr>
<th>Epidemiologic Block</th>
<th>&lt;15 population (millions)</th>
<th>1997 AFP Rate (Jan–May)</th>
<th>1998 AFP Rate (Jan–May)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>52</td>
<td>0.2</td>
<td>0.2</td>
<td>No change</td>
</tr>
<tr>
<td>West</td>
<td>60</td>
<td>0.26</td>
<td>0.27</td>
<td>No change</td>
</tr>
<tr>
<td>South</td>
<td>41</td>
<td>0.3</td>
<td>0.5</td>
<td>Increase</td>
</tr>
<tr>
<td>Central</td>
<td>13</td>
<td>0.2</td>
<td>0.3</td>
<td>Increase</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>26</td>
<td>0.05</td>
<td>0.04</td>
<td>No change</td>
</tr>
<tr>
<td>Congo</td>
<td>19</td>
<td>0.1</td>
<td>0.2</td>
<td>More polio</td>
</tr>
<tr>
<td>Angola</td>
<td>5</td>
<td>0.3</td>
<td>0.2</td>
<td>Decline</td>
</tr>
<tr>
<td>Nigeria</td>
<td>48</td>
<td>0.01</td>
<td>0.5</td>
<td>Dramatic increase</td>
</tr>
</tbody>
</table>

Proposed action plan for the African Region

The main constraints encountered in establishing effective AFP surveillance in the region included:

a) National immunization days were given the first priority for both human and financial resources.

b) Lack of transport and dedicated staff for surveillance

c) Delays in identifying and recruitment of staff.

d) Lack of communication, such as telephones, fax and e-mail for officers to transmit data and coordinate activities at national and sub-national levels.

In order to accelerate AFP surveillance, the following is the proposed action plan:

a) Employ one full-time national or international surveillance officer in each country, with transport and communication to be fully supported by WHO.

b) Each country should have 5-10 sub-national surveillance officers, with salary support from the national government (MOH) and WHO and partners supporting logistics (communication, transport, fuel, per diem for out-of-station travel).

c) In the four big countries (Angola, Democratic Republic of Congo, Ethiopia, Nigeria) two international officers/epidemiologists, one for NIDs and the other for surveillance, one technical officer, and one administrative officer should be assigned to each WHO country office to support the initiative.

d) Institute a mechanism for active monitoring active surveillance and virologic surveillance including geographic distribution of AFP cases and stool specimen collection.
5.2 Acceleration of AFP surveillance in South-East Asia: progress in India

There has been a significant expansion of polio eradication activities within the countries of the South East Asia Region. All countries in the region have implemented supplementary immunization activities and surveillance for AFP is fully implemented in all countries to permit the identification of the final chains of wild virus transmission and provide data needed for certification.

Progress in India, the second most populous country in the world and the largest polio-endemic country, is crucial for the success of the polio eradication initiative. India began to accelerate implementation of polio eradication in 1995 and has since completed annual successful national immunization days. The development of the national surveillance system for AFP began in April 1997 and was enhanced by the posting of 59 surveillance officers in October 1997. These officers provide training, technical assistance and logistic support to each of the 556 districts of India. By July 1998, 7500 health care institutions will have been enrolled in a weekly reporting network. In addition, nine WHO-accredited laboratories that conduct isolation of poliovirus from stool specimens of AFP cases support this network.

From January through July 1998, the surveillance network reported 3950 AFP cases; of these, 3432 (87%) were investigated within 48 hours of reporting and 2233 (57%) had two stool specimens collected for virus culture within 14 days of illness onset. Of the 5890 stool specimens collected, 5710 (97%) arrived in the laboratory in good condition. The results of clinical follow-up and virus isolation studies were used to classify AFP cases as polio or non-polio (updated as of 10 September 1998). Seventy-two percent (2032 out of 2813) of AFP cases eligible for 60 day follow-up (those with onset of paralysis from January through June 1998) had been examined for residual paralysis: 867 (43%) had no residual paralysis, 867 (43%) had residual paralysis, 73 (4%) were lost to follow-up and 225 (11%) died. The reported annual non-polio AFP rate for January through June 1998 was 0.83 cases per 100 000 children under 15 years, excluding 21% of AFP cases pending classification. Table 3 presents the summary of reported polio and AFP cases and stool specimen results from 1995-1998 and Figure 3 presents the reported polio and total AFP cases by month of onset from January 1994 to July 1998.

Proposed plan and future challenges for AFP surveillance in India

Progress in India, the second most populous country in the world and the largest polio-endemic country, is crucial to the success of the global initiative. India has completed three years of successful NIDs (1995-1996, 1996-1997, 1997-1998) followed by reduction in genetic biodiversity of circulating poliovirus type 1 and 3. The persistence of poliovirus type 2 and the remaining widespread distribution remaining types 1 and 3 strains suggests that substantial efforts will be required to eradicate polio from the region. The following activities are planned to further accelerate surveillance in the country:

a) Surveillance medical officers are now involved in providing technical assistance to state immunization officers in developing district-level plans to ensure enough resources are available for supplementary activities targeting high risk areas.
b) Re-organization of the national polio surveillance programme to include management and information units and 33 additional surveillance medical officers.

c) Further support is required to improve laboratory performance, data management and communication.

d) Continued advocacy to ensure high level of government commitment supported by co-operation, and responsiveness among all implementing agencies and donors.

Table 3: Number and rate of reported polio and AFP cases and stool specimen results, India, 1995-1998

<table>
<thead>
<tr>
<th>Year</th>
<th>Polio/AFP cases</th>
<th>Confirmed polio cases</th>
<th>Overall AFP rate</th>
<th>Non-polio AFP rate</th>
<th>Polio/AFP with stool specimens</th>
<th>Serotype distribution of wild poliovirus isolated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P1</td>
</tr>
<tr>
<td>1995</td>
<td>3263</td>
<td>3263</td>
<td>0.95</td>
<td>0</td>
<td>-</td>
<td>177</td>
</tr>
<tr>
<td>1996</td>
<td>1005</td>
<td>1005</td>
<td>0.29</td>
<td>0</td>
<td>-</td>
<td>95</td>
</tr>
<tr>
<td>1997</td>
<td>3050</td>
<td>2262</td>
<td>0.89</td>
<td>0.23</td>
<td>1370</td>
<td>398</td>
</tr>
<tr>
<td>1998</td>
<td>3950</td>
<td>829</td>
<td>1.92</td>
<td>0.83</td>
<td>2503</td>
<td>162</td>
</tr>
</tbody>
</table>

Figure 3: Impact of surveillance officers on AFP cases, India
5.3 Standardizing global AFP policy and performance indicators

A global update on AFP surveillance was presented to the TCG. The completeness of country reporting by WHO region, the non-polio AFP reporting rate by country and the proportion of cases with adequate stool specimens by region are presented in Figures 4, 5 and 6. During 1997, all regions had established routine feedback of information. Three regions (AMR, SEAR, and WPR) were providing feedback on a weekly basis, one region (EMR) on a monthly basis and two regions (EUR and AFR) were providing the information on a quarterly basis. The reported AFP and polio indicators by Region are summarized and published quarterly in the WHO Weekly Epidemiological Record.

**Figure 4: Completeness of AFP reporting, by WHO Region, 1996-1998**
Figure 5: Non-polio AFP rate per 100 000 children under 15 years of age, by WHO Region, 1996-1998

Figure 6: Percentage of AFP cases with two specimens collected, by WHO Region, 1996-1998
The TCG was presented with a number of issues in which there were inconsistencies in the calculation of some of the surveillance indicators. These were:

a) The definitions of adequate stool specimen rates: it was argued that there should be clarity on whether adequacy simply implied timeliness of the specimen.

b) The role of “pending cases” in the calculation of AFP rates, and

c) The cut-off points for investigation of AFP cases that are detected later than two months after onset of illness, and whether such cases should be included in the reported figures from a country.

d) This discrepancy arose because a number of countries had stopped reporting aggregate data upon institution of AFP surveillance. It was argued that countries should report both sets of data until detection sensitivity is equal to that of case-based reporting.

The TCG was concerned that some countries lacked even basic communication tools such as fax machines and e-mail, for immunization, surveillance and laboratory personnel.

Although facility-based surveillance is recognized as the highest priority, the TCG looks forward to receiving reports on the utility of involving the community in surveillance (e.g. in case detection, case reporting) when these become available.

The TCG noted that while most of the inconsistencies in AFP surveillance policies and data management have now been resolved, areas remain where harmonization is still needed.

**Recommendations:**

1) By the end of 1998, there should be full-time designated surveillance personnel with primary AFP responsibilities, at least at the national and provincial/state levels in all countries that have yet to achieve the level of surveillance needed for polio eradication. The duties of these personnel must include the implementation of weekly active surveillance for AFP cases at those major health facilities where cases are likely to seek care.

2) Ministries of health, international organizations, partner agencies and bilateral and multilateral organizations should recognize that the resources for surveillance are substantially less than those needed for NIDs but just as critical. Investment in surveillance has the potential to save substantial resources in the long run by better guiding supplementary immunization activities to interrupt transmission of wild poliovirus.

3) In estimating the resources needed for surveillance, programmes should include personnel costs (including laboratory staff), transport, specimen collection and delivery, communications (including for laboratories) and other essential supplies.

4) Where the private sector plays a significant role in the delivery of health services, a special effort should be made to include appropriate private sector sites in the surveillance network.
5) AFP surveillance data need to be thoroughly analysed to determine the characteristics of the remaining polio cases including age, vaccination status, urban/rural status, population group and geographic distribution. Determining whether cases are due to vaccine failures as opposed to a failure to vaccinate, combined with information on the populations where wild poliovirus is likely to persist, will be essential to improving supplementary immunization activities.

6) To ensure that surveillance data are available for timely action, AFP cases that are still pending 120 days after investigation should be regarded as ‘lost-to-follow-up’ and either classified as confirmed poliomyelitis or submitted to the national expert committee for review.

7) To standardize the reporting on surveillance indicators, non-polio AFP rates should be calculated by dividing the total number of AFP cases, excluding confirmed polio, by the total number of children aged less than 15 years. Facial paralysis should not be included in the numerator of the non-polio AFP rate, nor should facial paralysis cases be investigated as AFP cases.

8) Polio eradication requires the investigation, follow-up and classification of individual AFP cases (i.e. case-based surveillance). In those countries that have not yet achieved sensitive case-based surveillance, the number of routinely reported ‘polio cases’ (i.e. aggregate data) should be the figure used internationally when reporting on the status of polio endemicity.

9) The standard for investigating AFP cases is the collection of two stool specimens within 14 days after paralysis onset (target > 80% of AFP cases). However, if an AFP case is not identified until more than 14 days after onset, specimens should still be collected, up to 2 months from onset. A negative culture result alone for stools collected after 14 days will not be sufficient evidence to discard the case as non-polio AFP.

10) AFP cases that are detected between two and six months after the onset of paralysis may still represent an opportunity to correct surveillance system problems and identify previously unrecognized polio-infected areas. Therefore, ‘old’ AFP cases, (i.e. up to six months after paralysis onset) should be included in the reporting system, provided there is an opportunity to investigate these cases.

11) Surveillance reviews should be conducted and used to establish political support for surveillance, evaluate performance, review national policies, assess resource requirements and address operational constraints.
In 1997 the Global TCG endorsed the 6-point criteria for accreditation of the national laboratories of the Global Laboratory Network. Virtually all laboratories have been through the accreditation process. This experience suggests that 3 possible outcomes may be required: fully accredited, ‘provisional’ accreditation (i.e. excellent proficiency and on-site review, but insufficient specimens and/or poor timeliness) and non-accredited.

Most of the WHO Regional Offices now track the accreditation criteria for each laboratory. A mechanism has not been established for systematically collating this information at a central level. These data are essential, however, for targeting the resources needed to improve the Network.

The TCG was presented with an update of the accreditation status of the WHO Polio Network Laboratories.

<table>
<thead>
<tr>
<th>Region</th>
<th>Regional reference laboratories</th>
<th>National laboratories</th>
<th>Specialized laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pass</td>
<td>Pending</td>
<td>Fail</td>
</tr>
<tr>
<td>AFR</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>EMR</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>EUR</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>SEAR</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>WPR</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*One lab (Finland) provisional pass, 1997.

Although the accreditation process was in place, there were still substantial delays in many of the network laboratories in completing the processing of specimens and reporting of results on both proficiency panels and AFP case specimens. The TCG was particularly concerned that laboratory data was not always available on a timely enough basis to guide supplementary immunization activities.

6. The global laboratory network
Recommendations:

1) The results of each of the six accreditation criteria should be monitored at global as well as regional levels. These criteria should be objectively applied in determining the accreditation status of each laboratory.

2) All members of the Global Polio Laboratory Network must have telephone and fax communications necessary to allow direct and immediate communications with the national EPI managers and Regional Laboratory Co-ordinator. As a matter of urgency, and by the end of 1998 at the latest, WHO and partner agencies should have provided the resources and/or equipment needed such that these communication lines are functioning.

3) At the next meeting of the Global Polio Laboratory Network, strong consideration should be given to revising the accreditation process to allow for three outcomes: fully accredited, ‘provisional’ accreditation and non-accredited. Specimens from ‘non-accredited’ laboratories would need to be referred to an accredited laboratory.

4) WHO and partner agencies should ensure that stated national commitments to Global Polio Network Laboratories are translated into specific actions to strengthen laboratory capacity, including the provision of appropriate personnel, work space and communication mechanisms and authority.

5) The Global Polio Laboratory Network should urgently review the status of laboratory networks in all WHO Regions, develop action plans to rapidly accelerate Network development, particularly in regions where wild poliovirus circulation remains widespread, and present these plans at the upcoming Global Laboratory Network meeting in October 1998.
Once polio is eradicated, there will be no naturally occurring reservoirs of polioviruses. Laboratory stocks of wild polioviruses will then present an important threat to global eradication. There have been several documented incidents of inadvertent release of wild poliovirus from laboratory facilities in recent years. These events have been inconsequential because immunization programmes are in place and population immunity is, consequently, very high. However, if an escape were to occur years after immunization had ceased, it could prove disastrous.

If immunization is to be stopped, laboratory stocks of wild virus must be confined to secure facilities where inadvertent release is impossible. This will require that laboratory licensing authorities in every country inventory stocks of wild poliovirus. Those which are scientifically valuable should be removed to a designated secure facility. The remaining stocks should be destroyed. Documentation that all countries have either destroyed or contained laboratory stocks of wild virus will be required before polio immunization can be safely discontinued.

The TCG was presented with a plan of action for the safe handling and containment of polioviruses, which is being circulated for public comment. This plan recognizes that ensuring the containment and safe handling of polioviruses is an enormous exercise, requiring critical attention and extensive expertise in the area of biosafety.

The plan and the timetable for implementing it are linked to the major eradication objectives and consist of three phases.
Phase I: Pre-eradication

Safe handling of wild poliovirus infectious or potentially infectious materials (BSL-2/polio): To begin in 1998

Phase I, pre-eradication covers the present, when wild poliovirus is decreasing or no longer circulating in many areas of the world. Three tasks are critical to this phase.

1) Nations must identify and develop an inventory of laboratories that have wild poliovirus infectious material
2) Laboratories must institute enhanced biosafety level-2 (BSL-2/polio) procedures for safe handling of all such infectious or potentially infectious materials.
3) Nations must begin planning for implementation of Phase II biosafety requirements.

Phase II: Post-eradication

Containment of wild poliovirus infectious and potentially infectious materials (BSL-4): to begin one year after detection of last wild poliovirus.

Phase II, post eradication, begins one year after detection of the last wild poliovirus, at which time the probability is high that all human transmission has ceased. All laboratories possessing wild poliovirus infectious materials or potentially infectious materials must elect one or more of the following three options:

1) Implement maximum (BSL-4) containment procedures, or
2) Transfer wild poliovirus infectious and potentially infectious materials to WHO-designated repositories, or
3) Render such materials non-infectious, or destroy them, under appropriate conditions.

Because BSL-4 containment facilities are expensive to build and operate, most nations and most laboratories will elect one of the last two options. All Phase II biosafety actions are to be implemented and documented as complete by the end of year 2.

Phase III: Post-OPV immunization

Maximum containment of OPV and OPV-derived viruses (BSL-4): To begin when OPV immunization stops

Phase III, post-OPV immunization begins with the worldwide cessation of OPV administration. Strict control of OPV and vaccine-derived polio viruses will be required to prevent re-introduction of these viruses in unimmunized populations. At this time all facilities, including laboratories, clinics, immunization centres, physicians’ offices, and other sites with OPV or OPV-derived viruses must immediately comply with one of the following options:

1) Destroy OPV and OPV-derived viruses under appropriate conditions, or
2) Transport them to designated maximum containment (BSL-4) facilities.
The TCG welcomed the proposed global action plan and timetable for safe handling and maximum laboratory containment of wild polioviruses and potentially infectious materials. The TCG however noted that the mechanism for implementing this plan has not been finalized and the roles/responsibilities of groups inside and outside of WHO (e.g. certification commissions) remain to be defined.

It increasingly appears that a special task force for containment of polioviruses may need to be established by the Director-General to advise both WHO and the Global Certification Commission on the implementation and completion of this task. The most appropriate role of regional certification commissions may be to ensure that all countries have a containment plan of action, with the responsibility for monitoring the implementation of that plan resting with biosafety experts. As the EMC (Emerging Diseases) Division within WHO is currently responsible for containment and biosafety issues, this group may need to play a much larger role in polio containment.

**Recommendations**

1) WHO should establish a task force on poliovirus containment, drawing on both internal and external polio eradication and biosafety expertise, to advise both WHO and the Global Certification Commission on the timing, implementation and completion of this task. The issues to be addressed by the task force includes: development and management of laboratory inventory systems, the identification and accreditation of maximum containment facilities, the designation of repositories, and the policies and procedures for verification of compliance with containment requirements. A report of the Task Force should be submitted to the Global TCG.

2) As noted in section 1 above, the 1999 WHA Resolution on Polio Eradication should address the safe handling and containment of polioviruses, in addition to the need for increased commitment and resources from Member States.
8. Strategies for stopping immunization

Following the 1997 Global TCG Meeting, EPI/HQ commissioned a review entitled 'Transmissibility and Persistence of Oral Polio Vaccine Viruses: Implications for the Global Poliomyelitis Eradication Initiative'. An international consultation on 'Strategies for Stopping Polio Immunization' was convened in March 1998. The TCG was briefed on the conclusions and recommendations of the consultation.

The primary objective of the meeting was to assist the development of scientifically based policies of when and how to stop vaccination against polioviruses. The key scientific issue that will influence how cessation of OPV vaccination occurs is whether reverted vaccine-derived strains will continue to circulate after OPV is discontinued. This could occur if excreted viruses from the last cohorts of vaccinees establish chains of transmission in the new cohorts of non-OPV vaccinated individuals. Alternatively viruses from persistently infected immunocompromised individuals could potentially spread to and circulate in the general population. The meeting therefore reviewed available data on these and other issues to arrive at conclusions and recommendations for future studies and policies. The key scientific areas discussed included a) circulation of vaccine-derived polioviruses, b) potential for re-introduction of vaccine-derived strains into the community following cessation of immunization, c) studies currently in progress, d) strategies for stopping vaccination, e) scientific criteria for stopping immunization, and f) priority research questions.

8.1 Circulation of vaccine-derived polioviruses

Data from various sources indicate that vaccine-derived polioviruses circulate in communities for limited periods after cessation of immunization. The best evidence comes from virological surveillance after mass immunization campaigns in countries where supplemental OPV doses are not given between campaigns. Molecular evidence of only limited genetic drift in Vaccine viruses isolated from vaccine-associated polio cases in areas free of wild poliovirus but with low OPV coverage also supports limited circulation. Furthermore, outbreaks of poliomyelitis in partially OPV-immunized populations have always been due to wild type poliovirus and not Vaccine-derived strains. However, there is insufficient knowledge especially as to what will happen when population susceptibility increases.
8.2 Re-introduction of vaccine-derived polioviruses into a community after cessation of OPV vaccination

A potential source of re-introduction of vaccine-derived strains of OPV is laboratory stocks. A global action plan has been prepared for containment for wild polioviruses and will have been implemented before the decision to stop OPV vaccination is taken. A second source would be persistently infected immunodeficient individuals are also a potential source of continued seeding of Vaccine-derived polioviruses into a population. A very few long-term (several years) excretors are well documented. Studies are in progress to better determine the prevalence of long-term excretors both in developed and developing countries. Current surveillance strategies currently in place are directed towards wild-type polioviruses and therefore may not be sensitive enough for detection of Vaccine-derived polioviruses.

8.3 Studies currently in progress

Four groups of studies are currently being funded to answer the questions excretion and circulation of Vaccine-derived strains. A total of 18 studies were initiated in 1997 and they address the transmissibility and persistent excretion of vaccine-derived strains. Recently there has also been renewed interest in the effect of anti-viral compound (pleconaril) in eliminating excretion of the Sabin-derived strains. A summary of studies in progress is presented in Table 5 below.

Table 5: Summary of studies in progress

<table>
<thead>
<tr>
<th>Study objective</th>
<th>Setting</th>
<th>Population</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine-derived virus circulation in population</td>
<td>Developing country</td>
<td>Population-based</td>
<td>Brazil/Columbia Cuba Indonesia Mexico</td>
</tr>
<tr>
<td>Poliovirus excretion in immunodeficient individuals</td>
<td>Industrialized country</td>
<td>Individual</td>
<td>United Kingdom United States of America</td>
</tr>
<tr>
<td>Poliovirus excretion in HIV-infected persons</td>
<td>Developing country</td>
<td>Individual</td>
<td>Haiti Kenya</td>
</tr>
<tr>
<td>Poliovirus excretion in immunodeficient individuals</td>
<td>Developing country</td>
<td>Individual</td>
<td>Cuba Ethiopia Guatemala Pakistan</td>
</tr>
</tbody>
</table>
8.4 Strategies for stopping OPV vaccination

There are several possible strategies to stop vaccination and it is likely that different countries will adopt different approaches. Some countries may simply decide to stop OPV. Alternatively, some countries may decide to continue with IPV for a certain period after cessation of OPV. Another strategy would be to move to a period of global IPV usage, perhaps in combination with other antigens. Vaccine manufacturers indicate that they could develop the capacity to provide for this option but will need sufficient time to obtain the necessary regulatory approval, to scale-up, and to receive returns on the necessary investment for this option to work. Whatever strategy is used it will be important to co-ordinate cessation of OPV in all countries at the same time so that vaccine-derived polioviruses are not continually re-introduced across borders. A novel strategy would be to use new genetically more stable live attenuated polioviruses in place of OPV or genetically engineered IPV seeds with lower virulence than current seeds. So far no such vaccines are licensed but several candidate strains are under development. Finally, stockpiles of vaccine, both OPV and IPV for maximum flexibility, should be prepared for emergency use.

8.5 Scientific criteria for stopping vaccination

Vaccination with OPV should stop and vaccination with IPV can stop when there is:

a) sufficient assurance of the global eradication of wild type polioviruses,
b) suitable laboratory containment of remaining stocks of wild polioviruses,
c) evidence that vaccine-derived polioviruses will circulate for only a limited period in the post-vaccination era. Global certification will provide assurance of the absence of wild poliovirus circulation. Implementation of the global action plan for laboratory containment of wild polioviruses will provide assurance of suitable containment of poliovirus stocks.

8.6 Key research questions

The meeting identified the following as key research questions to guide decisions on stopping vaccination post polio eradication.

1) Studies are required on the transmissibility of all three Vaccine-derived poliovirus serotypes and their persistence in the general population.

2) Studies already in progress should be encouraged and expanded on the potential of immunodeficient individuals to re-seed vaccine-derived polioviruses into communities after cessation of OPV vaccination.

3) Studies are required on appropriate surveillance strategies for vaccine-derived polioviruses.

4) Studies are required to evaluate potential strategies for cessation of vaccination

The TCG endorsed the proposed research agenda to address the important gaps that exist in the scientific knowledge and the proposal for the EPI and VRD units of GVP to establish a working group to co-ordinate this research.
Recommendations:

1) The TCG endorses the current research agenda for developing a strategy for stopping immunization, recognizing however that this is an evolving process. The TCG should be regularly updated on progress and results of this effort.

2) The TCG should be represented in the deliberations of the GPV working group on strategies for stopping immunization.
9. Resources for polio eradication

9.1 Funding of the eradication initiative

The vast majority of the costs of polio eradication are borne by the polio-endemic countries themselves. In the Americas, the endemic countries covered an estimated 80% of the costs of polio eradication activities, while in countries such as China and Indonesia, that figure was over 90%. Precisely quantifying the national contribution to polio eradication activities is complicated by many sources from which those resources are made available, ranging from central ministries to local village councils and private businesses. In addition a large proportion of the national resources are ‘in-kind’ contributions such as personnel, transport and fuel. With the acceleration of the initiative in countries with less financial capacity, however, as much of the African continent, such external support has been required for closer to 50% of the costs. In the most difficult countries, such as Somalia and South Sudan, at least 75% of the overall costs of eradication activities have been required from external sources. Figure 7 presents the breakdown of external financial resources contributed by the coalition of partners for country.

Figure 7. Summary of the US$167 million contributed for country-level polio eradication activities in 1998

<table>
<thead>
<tr>
<th>Agency</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC</td>
<td></td>
</tr>
<tr>
<td>USAID</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
</tr>
<tr>
<td>DANIDA</td>
<td></td>
</tr>
<tr>
<td>DFID/UK</td>
<td></td>
</tr>
<tr>
<td>Rotary Int.</td>
<td></td>
</tr>
<tr>
<td>Other*</td>
<td></td>
</tr>
</tbody>
</table>

Shortfall = US$50 million
9.2 Polio eradication resource requirements at the national level

In addition to achieving and maintaining high routine immunization coverage with OPV the eradication initiative requires supplementary immunization activities (NIDs and mopping-up immunizations), heightened surveillance (detection and investigation of all AFP cases and laboratory investigation of the cases). Figure 8 shows the total external resources required for implementing these strategies at the country level between 1997 and the year 2005 and either the existing or projected financial commitments as of 1 June 1998. As virtually all countries have now begun implementing the eradication strategies, the estimates are based on the known costs of these activities. In the few countries where polio immunization or surveillance activities have yet to be implemented, the estimates have been based on known costs in countries with similar political, economic and epidemiological characteristics.

Figure 8: Polio-eradication country-level activities - resource requirements, 1997-2005

9.3 External requirements for polio eradication by WHO Region

As the polio eradication initiative is coordinated by WHO through its Regional Offices, Table 6 summarizes the resource requirements for 1999 by major category of expenditure. The costs are presented as the total unmet external resource requirement as of 1 June 1998.
Table 6: Summary of external resource requirements for polio eradication by WHO Region and major category of expenditure

<table>
<thead>
<tr>
<th>Category</th>
<th>AFRO</th>
<th>EMRO</th>
<th>EURO</th>
<th>SEARO</th>
<th>WPRO</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational costs</td>
<td>$54.6 m</td>
<td>$11.4 m</td>
<td>$2.6 m</td>
<td>$54.0 m</td>
<td>$2.8 m</td>
<td>$125.4 m</td>
</tr>
<tr>
<td>Shortfall</td>
<td>$37.3 m</td>
<td>$8.9 m</td>
<td>$2.6 m</td>
<td>$34.7 m</td>
<td>$2.7 m</td>
<td>$86.3 m</td>
</tr>
<tr>
<td>Vaccine costs</td>
<td>$21.6 m</td>
<td>$11.3 m</td>
<td>$4.1 m</td>
<td>$56.9 m</td>
<td>$4.8 m</td>
<td>$98.7 m</td>
</tr>
<tr>
<td>Shortfall</td>
<td>$6.6 m</td>
<td>$5.5 m</td>
<td>$1.3 m</td>
<td>$28.0 m</td>
<td>$4.8 m</td>
<td>$46.3 m</td>
</tr>
<tr>
<td>Surveillance /Lab</td>
<td>$11.2 m</td>
<td>$5.5 m</td>
<td>$1.7 m</td>
<td>$11.3 m</td>
<td>$2.0 m</td>
<td>$31.7 m</td>
</tr>
<tr>
<td>Shortfall</td>
<td>$7.6 m</td>
<td>$4.1 m</td>
<td>$1.0 m</td>
<td>$3.4 m</td>
<td>$1.9 m</td>
<td>$18.1 m</td>
</tr>
<tr>
<td>Total costs</td>
<td>$87.5 m</td>
<td>$28.4 m</td>
<td>$8.4 m</td>
<td>$122.1 m</td>
<td>$9.6 m</td>
<td>$256.0 m</td>
</tr>
<tr>
<td>Shortfall</td>
<td>$51.6 m</td>
<td>$18.5 m</td>
<td>$4.9 m</td>
<td>$66.0 m</td>
<td>$9.4 m</td>
<td>$150.6 m</td>
</tr>
</tbody>
</table>

The funding shortfalls are not equally distributed across the eradication activities and geographic areas. Proportionally, the projected shortfalls are greatest in (i) establishment of a surveillance infrastructure in the African continent, (ii) implementation of both surveillance and immunization eradication activities in countries affected by conflict (Afghanistan, Angola, Liberia, Sierra Leone, Somalia, South Sudan, Tadjikistan) and (iii) operational costs for NIDs in countries that constitute the major global reservoirs (Bangladesh, DR Congo, Ethiopia, India, Nepal, Nigeria, and Pakistan).

9.4 Resource requirements at the WHO global and regional levels

To implement the activities outlined above, resources are required primarily in the following areas: Global Laboratory Network (operational costs and equipment/supplies), surveillance, country-level support (expert consultant support, emergency equipment/supplies), staff, technical meetings, research, advocacy and information. Figure 9 shows the costs and projected shortfall for the polio eradication activities in the EPI Unit of GPV/WHO/Geneva.
Table 7: Summary of the EPI/GPV/HQ resource requirements for polio eradication for the biennium 1998-1999

<table>
<thead>
<tr>
<th></th>
<th>Laboratory network/ surveillance</th>
<th>Regional and country support</th>
<th>Staff</th>
<th>Technical meetings</th>
<th>Research</th>
<th>Advocacy and information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total costs</strong></td>
<td>$4.2 m</td>
<td>$2.8 m</td>
<td>$4.2 m</td>
<td>$1.0 m</td>
<td>$0.6 m</td>
<td>$0.7 m</td>
</tr>
<tr>
<td><strong>Shortfall</strong></td>
<td>$2.9 m</td>
<td>$1.0 m</td>
<td>$1.0 m</td>
<td>$0.2 m</td>
<td>$0.4 m</td>
<td>$0.4 m</td>
</tr>
</tbody>
</table>

In addition to the resources at the global level, there are similar funding shortfalls in each of the WHO Regional Offices, where the costs of polio eradication activities, excluding country-level staff, are approximately two to give million US dollars.

The Global TCG was impressed with the tremendous progress that has been made in the polio eradication initiative since its last meeting in 1997. In particular, the TCG notes that national NIDs have been conducted and surveillance has improved dramatically especially in South Asia and parts of Africa. However, the polio eradication programme is at a critical stage with 900 days remaining before the target date of the year 2000 and much more work to be done. It is critical to achieve eradication as close as possible to the target date, because of the potential for fatigue in eradication efforts in those areas that have already been successful, thereby jeopardizing the entire eradication initiative.
The eradication initiative must be accelerated. The TCG is convinced that the established strategies when fully implemented will achieve eradication. The remaining polio burden is a result of failure to adequately implement these strategies, largely due to insufficient resources. In addition, the strategies need to be applied creatively and adapted to conditions at the country level. No single approach will meet the needs of all countries.

The Global TCG is deeply concerned that the resources needed to complete polio eradication have not been identified at this time. These unmet resources, totalling nearly US$150 million for 1999 alone, are the single greatest obstacle to global eradication. Despite the excellent partner co-ordination in 1997-1998, there remain substantial problems that include not only insufficient funds, but also a lack of flexibility with the available funds, late or delayed arrival of funds and inefficient/inappropriate mechanisms for their disbursement.

It has become increasingly evident that there are substantial gaps in the communications, promotion and advocacy of the programme. There is a critical need for WHO to improve the co-ordination of these activities with partner agencies.

Recommendations:

1) Because of the time sensitive needs of the polio eradication effort, this programme must be made a top priority of WHO, other UN Agencies, national governments, partners, multilateral agencies and the global community. Commitment of the leadership at the highest level in all these organizations is essential to eradicate polio.

2) Despite its achievements, the eradication effort has already been seriously impeded by the unmet needs in human and financial resources, particularly for surveillance, additional immunization activities (e.g. house-to-house mopping-up immunization) and operations. These unmet resource requirements will increase over the next several years unless vigorous efforts are made to solicit resources and transfer them rapidly to the country and local levels in support of implementation of the planned activities. The TCG recommends that WHO and other stakeholders work collaboratively to advocate for the needed resources. The TCG welcomes the recommendations of the Scientific Advisory Group of Experts (SAGE) to the new Director-General of WHO on fundraising and advocacy for the programme (Annex 1).

3) As part of a concerted effort by WHO to raise the profile of the polio eradication initiative, a resolution should be discussed at the next WHO Executive Board Meeting and presented at the 1999 World Health Assembly. This resolution should stress the priority and urgency of full commitment of national governments and other partners to achieve the target.

4) Those agencies involved in polio eradication must recognize that insistence on standard administrative procedures results in unacceptable delays in the implementation of eradication activities. All such organizations must ensure that matters related to polio eradication are not at risk of administrative delays.
5) To ensure timely availability of complete and consistent data for co-ordinated fundraising activities for polio eradication, WHO/HQ and its Regional Offices should update both the total external resource requirements and unmet needs by country, every 6 months. Emergency funding shortfalls should be collated on a quarterly basis.

6) The priority for fundraising should be directed to global reservoir countries as they have the greatest needs. Aggressive efforts should be made to mobilize country level Interagency Coordinating Committees (ICCs) in every major global reservoir (see below), involving WHO Regional or HQ participation. All existing partners should actively recruit new partners to these ICCs.

7) As a critical component of fundraising efforts with potential new partners, WHO, UNICEF and the recipient countries should demonstrate the achievements to date in polio eradication and enunciate the benefits for all partners.

8) All possible resources of the international organizations, from the WHO through the UN General Assembly, will need to play an active role in the oversight and implementation of polio eradication activities, particularly in the most difficult countries and those affected by conflict.
Annex 1: Agenda

Tuesday, 7 July 1998

08:00-08:30  Registration
08:30-08:45  Opening
  Introductions and election of officers
  Administrative remarks

Session 1: Global overview, priorities & inter-regional co-ordination
08:45-09:00  Status and timeline of the polio eradication initiative
              B. Aylward
09:00-09:15  Discussion

Session 2: Interrupting polio transmission in the global reservoirs
09:15-09:30  South Asia (India, Bangladesh, Nepal, Pakistan, Afghanistan)
              SEARO
09:30-09:45  West and Central Africa (particularly Nigeria, D R Congo)
              AFRO
09:45-10:30  Discussion

10:30-11:00  Coffee
11:00-11:15  Horn of Africa (Djibouti, Ethiopia, Eritrea, Somalia, Sudan)
              EMRO
11:15-11:25  Polio eradication in the setting of a complex emergency
              C. Tinstman
11:25-11:45  Discussion
11:45-12:00  High-risk response immunization (mopping-up)
              WPRO
12:00-12.30  Discussion
12:30-13:30  Lunch

Session 3: Acceleration of AFP surveillance
13:30-13:45  Status and plan of action for AFP surveillance in AFRO
              AFRO
13:45-14:00  Impact of the National Polio Surveillance Project (N PSP), India
              MOH/India
Tuesday, 7 July 1998 (continued)

14:00-14:45 Discussion
14:45-15:00 Standardizing global AFP policy and performance indicators M. Birmingham

15:00-15:30 Discussion

15:30-16:00 Coffee

Session 4: Accreditation of the global laboratory network

16:00-16:15 Experience with the Global Accreditation Process D. Featherstone
16:15-16:30 Proposed revisions to the accreditation criteria R. Sanders

16:30-17:00 Discussion
17:00 Adjourn

Wednesday, 8 July 1998

Session 5: Containment of polioviruses and stopping immunization

08:30-08:45 Strategy and plan of action for the containment of polioviruses W. Dowdle

08:45-09:15 Discussion
09:15-09:30 Current knowledge on the persistence of OPV circulation D. Wood
09:30-09:45 Research agenda for ‘Stopping immunization’ R. Sutter

09:45-10:30 Discussion
10:30-11:00 Coffee

Session 6: Resources for polio eradication

11:00-11:15 Human & financial resource requirements for polio eradication H. Hull

11:15-11:30 Discussion
11:30-12:15 Review of conclusions and recommendations
12:15-12:30 Closing
Annex 2:
List of participants

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