Report on the
SECOND INTERCOUNTRY MEETING
OF NATIONAL CONTAINMENT COORDINATORS FOR
LABORATORY CONTAINMENT OF WILD POLIOVIRUSES
AND POTENTIALLY INFECTIOUS MATERIALS

Damascus, Syrian Arab Republic, 25–26 September 2002

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1. INTRODUCTION

The second intercountry meeting of national coordinators for laboratory containment of wild polioviruses and potentially infectious materials was held in Damascus, Syrian Arab Republic, from 25–26 September 2002. Participants included representatives from Bahrain, Cyprus, Djibouti, Egypt, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic and United Arab Emirates.

Dr Faten Kamel, Medical Officer, welcomed the participants and addressed them on behalf of Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean. In his message, Dr Gezairy welcomed the participants and thanked His Excellency Dr Mohamed Eyad Chatty, Minister of Health, and the Government of the Syrian Arab Republic for hosting the meeting. He drew attention to global and regional progress towards polio eradication and noted that it was essential to guard against potential threats to this achievement, in particular accidental release of the wild virus from laboratory stocks. He also urged countries to expedite implementation of the containment plan.

Dr Vandah Barakat (Lebanon) was elected as Chairman for the first day and Dr Ossama Rasslan (Egypt) for the second day. Dr Hala Saba (Syrian Arab Republic) was elected Rapporteur of the meeting. The programme and list of participants of the meeting are included as Annexes 1 and 2, respectively.

2. REVIEW OF THE RECOMMENDATIONS OF THE FIRST INTERCOUNTRY MEETING OF NATIONAL CONTAINMENT COORDINATORS

Dr S. Hafez, WHO/EMRO

The role of the Regional Office for the Eastern Mediterranean in implementing the regional containment plan as identified in the first intercountry meeting of national containment coordinators was advocacy, obtaining high-level political commitment and provision of technical assistance to countries. Advocacy for containment goals was effectively covered through addressing containment in the following intercountry meetings in chronological order: fifth intercountry meetings of directors of poliovirus laboratories in the Eastern Mediterranean Region, Cairo, Egypt, 21–23 May 2001; NCC meeting Cairo, Egypt, 31 March–2 April, 2002; RCC meeting Cairo, Egypt, 4–6 June, 2002; and the 19th EPI and 15th Regional TAG meeting, Rabat, Morocco, 24–27 June 2002. To enhance political commitment the Regional Director had requested addressed national authorities of all countries of the Region other than Afghanistan and Somalia in September 2001 to respond to a questionnaire on the state of implementation of national containment plan and identify problems encountered.

Technical assistance was provided through in-country consultant visits to Islamic Republic of Iran Iraq, Jordan, Morocco and Sudan to support and enhance containment activities. Financial support of country needs relevant to containment activities was provided; this included support of in-country awareness meetings, verification visits and assignment of a national consultant (SSA) in Lebanon.
All countries in the Region were required to: utilize the regional containment plan and guidelines to develop and implement containment plans; allocate sufficient human and financial resources to carry out containment activities; determine/identify existing legislation related to registration of laboratories or biosafety that can influence compliance to containment action; disseminate information on containment to enhance compliance with national plan through multiple communication strategies including media; ensure that all biomedical laboratories in health and non-health sectors are included; and appoint subnational containment coordinators (as appropriate) to assist and follow up at governorate/district levels. Finally, countries have to document the measures they have taken for laboratory containment of wild poliovirus in the report to the regional certification committee. The implementation of recommendations by countries was elucidated during country presentations.

3. GLOBAL STATUS OF POLIOMYELITIS ERADICATION INITIATIVE

Dr Esther de Gourville, WHO/HQ

The global polio eradication initiative has made remarkable progress since 1988 when the World Health Assembly first resolved to eradicate polio. Between 1988 and the end of 2001, the number of polio endemic countries decreased from more than 125 to 10, and the number of reported polio cases decreased from an estimated 350,000 to 483, a percentage decrease of more than 99%. Wild-type 2 poliovirus has not been detected worldwide since October 1999, despite improvements in surveillance. Two former polio reservoirs, Bangladesh and Democratic Republic of Congo, have been polio-free for more than two years. Three of six WHO regions have already been certified as free of indigenous polioviruses, namely the Region of the Americas and Western Pacific and European Regions.

Poliovirus transmission continues in 2002 in India (predominantly in the northern provinces of Uttar Pradesh and Bihar), Afghanistan, Pakistan, Nigeria, Somalia and Niger (3 cases) with both type 1 and type 3 poliovirus serotypes being detected. Two polio cases due to type 1 poliovirus were also detected in Zambia, and probably represent imported viruses from neighbouring Angola based on the molecular characteristics of the viruses. Polio cases have not been detected in Angola in 2002, but a single type 1 case was last reported in 2001. Insecurity and civil unrest present challenges to accessing populations for OPV immunization in Afghanistan, Angola, Somalia and Sudan. Challenges to the eradication initiative also include the risk of importation of wild poliovirus into polio-free areas, such as was seen in Algeria, Bulgaria, Georgia, and Mauritania in 2001. The detection of vaccine-derived polioviruses in, Hispaniola and the Philippines in 2001, and Madagascar and Romania in 2002, reinforces the urgent need for achieving the eradication goal and determining the appropriate polio-immunization strategy for use in the polio-free era.

The quality of AFP surveillance has attained certification standard in most countries of the world. In 2001 the annual non-polio AFP rate per 100,000 population under 15 years of age remained well above the required rate of 1.0 in all regions and endemic countries. In 2001, all WHO regions except the African Region reached the certification requirement of collection of 2 adequate stool specimens from at least 80% of AFP cases, and this indicator continued to improve in the African Region in 2002. Surveillance efforts are supported by
high quality laboratory investigations. In 2002, 132 of 145 Global Polio Network Laboratories are fully accredited by WHO.

The large increase in polio cases in India and Nigeria in 2002 compared to 2001 is of great concern. Up to August 2002, a total of 443 poliovirus cases were reported in India (compared to 268 cases reported in 2001), out of which 400 were of type 1 and 43 were type 3 polioviruses. In the same period, 82 wild virus positive cases were reported in Nigeria compared to 56 cases reported in 2001. Transmission appears to be at about the same level in Pakistan in 2002 compared to 2001. In India, Nigeria and Pakistan, there continues to be shrinkage in the biodiversity of wild polioviruses. Eight districts in western Uttar Pradesh, India, have been identified as having multiple co-circulating genetic lineages of wild viruses. In both India and Nigeria, routinely collected OPV immunization data on investigated non-polio AFP cases show that OPV coverage is less in areas sustaining poliovirus transmission compared to polio-free areas of both countries. Independent monitoring of immunization campaigns in India suggests that children in 10% to 15% of houses were not vaccinated in some high-risk areas.

Angola, Ethiopia and Sudan are all considered to be at risk of low level poliovirus transmission because of gaps in AFP surveillance or OPV coverage in some areas. Similarly, Somalia and Egypt are considered to be low level transmission countries; the former because of detection of 2 cases in 2002 and the latter because of detection of wild viruses from sewage samples in different parts of the country.

Continued political commitment to polio eradication, access to children in conflict-affected countries, and high quality OPV immunization and surveillance activities are all still required to meet the goal of polio eradication.

4. REGIONAL STATUS OF THE POLIOMYELITIS ERADICATION INITIATIVE

Dr Faten Kamel, WHO/EMRO

Rapid and significant progress towards the eradication of poliomyelitis continues to be witnessed in all countries of the Eastern Mediterranean Region. In 1988, poliomyelitis cases were reported from 22 of the 23 countries of the Region, with more than 2000 cases reported by weak surveillance systems that did not reflect the true incidence of poliomyelitis. Since the beginning of 2002, poliovirus transmission had been interrupted in 18 countries of the Region for 3 or more years. In addition, Sudan has not reported a poliomyelitis case for more than one year, indicating possible interruption of wild poliovirus transmission, Egypt had no cases for almost one year and virus transmission had become more geographically localized in the remaining 3 countries (Afghanistan, Pakistan and Somalia).

In the presence of a very well developed and efficiently performing surveillance system, the number of confirmed cases of poliomyelitis reported during 2001 in countries of the Region has decreased to only 143 (virologically confirmed cases) compared to 505 (287 poliovirus confirmed cases) in 2000. Through mid September 2002, 54 cases were reported from only 3 countries (Afghanistan, Pakistan and Somalia). In 2002, wild polioviruses types 1
and 3 were detected in Afghanistan and Pakistan, and type 3 was detected in Somalia. Wild poliovirus type 2 has not been isolated in the Region since 1997.

During 2001, Pakistan continued to report the largest number of virus-confirmed cases in the Region, although the total number of cases reported declined by nearly 45% compared with 2000 (119 compared to 199). The geographical extent of transmission was reduced to fewer districts in each province. During 2001, cases were reported from 39 districts, compared to 59 districts in 2000. Up to mid September 2002, 45 cases were reported from 28 districts.

The extent of virus transmission, both the number of virus isolates and number of affected districts, has been reduced in Afghanistan. By the end of 2001, 11 confirmed cases of poliomyelitis were reported. Compared with 2000, this represents a nearly 60% decline in the number of reported polio cases. More importantly, 9 of the 11 cases were reported from areas in and around Kandahar City in the southern region. The other two cases were reported in September and October from eastern provinces bordering Pakistan. As of mid October 2002, the laboratory had confirmed 7 cases. Four of them were reported from the same areas in the southern (and close by Western) and eastern regions of the country. In addition, cases were reported from Kunduz, Kabul and Zabul. This situation was expected following the massive movement of returnees and internally displaced persons (IDPs) inside Afghanistan.

In Somalia, the major obstacle to the polio eradication is access to difficult areas. However, the outbreak of poliomyelitis that occurred in Mogadishu in 2000 was controlled, and during 2001 a total of 7 cases were identified in the highly populated regions of Lower Shabelle and Banadir (Mogadishu), mostly representing the tail of the 2000 epidemic. Two cases have been reported to date in 2002, from Mogadishu and a region nearby.

In Sudan, only one virus was isolated from the southern region of the country in April 2001, after a gap of 9 months since the isolation of the last virus from the northern states in July 2000. No cases of poliomyelitis have been discovered in Sudan for more than one year.

Localized wild poliovirus transmission in Upper Egypt continued in 2001. Five virologically confirmed poliomyelitis cases were reported, 3 from the southern governorate of Minya and 2 from Qena. In addition, wild poliovirus was isolated from different sites included in environmental surveillance.

Poliomyelitis eradication programme activities are very closely monitored in the remaining endemic countries of the Region. Technical and managerial reviews are frequently undertaken by independent international experts. In addition, Technical Advisory Groups (TAG) for the priority countries regularly review the epidemiological situation and national plans and provide technical advice. Their collective conclusions indicate that if high-level commitment to achieving polio eradication is continued with enhanced strategy implementation, it is likely that poliovirus transmission in the Region will be interrupted by the end of 2002 or early 2003.
The progress noted in the Region is the result of intensification in implementation of the following basic poliomyelitis eradication strategies.

a) Supplementary immunization activities

The intensification of national immunization days (NIDs) and other supplementary immunization activities, which started during 1999 in endemic and recently endemic countries (Afghanistan, Egypt, Iraq, Pakistan, Somalia and Sudan), reached a peak in 2001. All of these countries conducted more than two NID rounds.

These intensified NIDs and other mass campaigns were characterized by detailed microplanning, multisectoral involvement, intensified supervision, greater focus on high-risk areas and, most importantly, house-to-house vaccine delivery. Monitoring and evaluation activities showed that these intensified campaigns were very effective in further increasing the coverage of children under 5 years of age. The allocation of additional financial resources by partners has made it possible to undertake these intensified activities by ensuring the recruitment of national and international experts.

During 2001, most polio-free countries conducted NIDs or SNIDs, targeting provinces and areas at risk of poliovirus importation and/or with sub-optimal immunization coverage and/or inadequate surveillance.

The accelerated eradication activities are continuing in 2002. It is planned that by the end of 2002, using the house-to-house vaccine delivery strategy, all endemic and recently endemic countries (Afghanistan, Egypt, Pakistan, Somalia and Sudan) would have conducted at least two pairs of NIDs and one or more rounds of SNIDs in high-risk districts. These rounds are aimed to be of the highest quality and to reach all children through house-to-house immunization throughout the country.

The Regional Office has ensured the availability of technical assistance in all aspects of NID planning, implementation and evaluation, particularly for Afghanistan, Iraq, Pakistan, Somalia, Sudan and the Republic of Yemen, through fielding more than 100 international experts and recruiting 700 national staff.

b) Surveillance for acute flaccid paralysis

One of the main achievements in poliomyelitis eradication in the Region is that all countries of the Region have established well functioning national systems for acute flaccid paralysis (AFP) surveillance, which has also improved capacity for detection and reporting of other EPI target diseases. Establishment of effective AFP surveillance in countries affected by war and in areas with rudimentary or non-existent health care services, such as in Afghanistan, Somalia and south Sudan, has been a great achievement.

During 2001, AFP surveillance continued to improve throughout the Region, and the required level of sensitivity (non-polio AFP rate exceeding one case per 100 000 children under 15 years of age) that was reached at regional level for the first time in 1999 was further
improved in 2001 (1.87 cases per 100 000 children under 15 years). In addition, polio AFP rates of one or more case per 100 000 children under 15 years of age were reported from all countries of the Region except Djibouti. Further improvement is noted from data available for 2002 (up to mid September), with an annualized rate equal to 2.2.

The second key indicator for quality of AFP surveillance is the adequacy of specimen collection: at least 80% of all AFP cases should have adequate stool specimens. In 2001, 16 countries (Djibouti, Egypt, Islamic Republic of Islamic Republic of Iran, Iraq, Jordan, Kuwait, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates and Republic of Yemen) met or exceeded this criterion and in 2 other countries (Afghanistan and Sudan) adequate specimens were collected from >70% of cases. Region-wide, the percentage of AFP cases with adequate stool specimens increased from 70% in 2000 to 83.1% in 2001 Further improvement was noted in 2002 (as at mid September), with 88% of AFP cases having adequate specimens.

As part of acceleration efforts, active AFP surveillance was initiated and strengthened in all countries, with recruitment of sufficient national surveillance officers and provision of required supplies, equipment and technical support from the Regional Office. In view of continued progress of surveillance, all countries of the Region used the virological scheme in classification of AFP cases. This high quality surveillance is also guiding targeted immunization activities in countries.

The remaining challenges are to sustain the political commitment of the governments and ensure funding support for the implementation of polio eradication activities. The Regional Office has planned to continue to accelerate polio eradication activities in endemic countries and conflict countries including conducting high quality immunization days; rigorous implementation of surveillance and its review; recruitment of national and international staff in priority countries; and coordination and synchronization of NIDs between countries of the Region and with neighbouring regions.

5. GLOBAL PROGRESS IN CONTAINMENT STRATEGIES

Chris Wolff, WHO/HQ

Countries in all WHO regions have now begun to implement the first phase of activities of the Global Action Plan for Laboratory Containment of Wild Polioviruses. The Global Action Plan was reviewed during a meeting at WHO headquarters in October 2001 and the participants concluded that the activities outlined in the plan for phase I were appropriate and effective. Experience in a broad range of countries throughout the world has confirmed this. This meeting also concluded that the biosafety recommendations for the second and third phase should be reviewed to reflect varying levels of risk associated with different conditions for handling wild poliovirus infectious and potential infectious materials. A second edition of the Global Action Plan has now been written to reflect these recommendations and will be

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1 Adequate specimens: 2 stool specimens collected at least 24 hours apart within 14 days of the onset of paralysis and arriving at the laboratory in good condition.
published by December 2003. The Global Commission for Certification of Polio Eradication has stated that all countries of the world will need to provide sufficient evidence that all activities for phases I and II have been completed before Global Certification of Polio Eradication is declared. Three WHO regions have been certified as polio-free, AMR, WPR and EUR, and containment activities have progressed greatly in these countries. Non-endemic countries in regions yet to be certified polio-free have also begun implementing activities. In total, 138 countries/territories of the world have appointed a national task force, 129 have created a national plan, 121 are now conducting a survey of laboratories and 76 have completed and submitted a national inventory of laboratories reported to be holding wild poliovirus materials. Key elements for successful implementation of the first phase activities have been identified as having high-level political support, an effective task force, careful planning and advocacy before implementation including pilot testing, and extensive follow-up. In summary, much progress has been made world-wide in preparing laboratories for a polio-free world.

6. REGIONAL PROGRESS TOWARDS CONTAINMENT

Dr S. Hafez, WHO/EMRO

Although containment of wild polioviruses has consistently been part of the agenda of intercountry meetings of directors of poliovirus laboratories in the Eastern Mediterranean Region since 1998, the major milestone in the regional progress towards laboratory containment of wild polioviruses was the development of the regional guidelines for implementation of laboratory containment of wild polioviruses in February 2000. In the same month, the guidelines were distributed to three pilot countries (Oman, Saudi Arabia and Tunisia) and the national authorities in these countries were requested to implement containment plans. In May of the same year, members of the Regional Certification Commission were briefed on the regional containment plan, and the plan was presented to the directors of poliovirus laboratories in the fourth intercountry meeting of Directors of Poliovirus Laboratories in the Eastern Mediterranean Region in Muscat, Oman, 16–18 May 2000. By July the national authorities in the remaining countries of the Region except Afghanistan and Somalia were requested to implement containment plans. The 47th Regional Committee for the Eastern Mediterranean endorsed the regional containment plan in October. A series of in-country consultant visits to assist the formulation of national containment plans in Islamic Republic of Iran, Jordan, Lebanon, Oman, Saudi Arabia and Tunisia, took place from June through September.

The first intercountry meeting of national containment coordinators was held in Cairo, Egypt in March 2001. All countries of the Region were invited except Afghanistan and Somalia, and 17 countries attended. Drafts of national plans were prepared. Iraq, Palestine, United Arab Emirates and the Republic of Yemen did not attend the meeting. Six months later, the national authorities in all countries except Afghanistan and Somalia were requested to complete phase I of their national laboratory containment plan by December 2001, and respond to a questionnaire to clarify the state of implementation and identify encountered problems.
In March 2002, proper evaluation of the response to the questionnaire and containment reports presented to the Regional Certification Commission indicated that 4 countries had completed the laboratory survey and inventory phase: Bahrain, Oman, Qatar and United Arab Emirates. Acceleration of containment activities had been initiated in the remaining countries.

Alignment of regional activities with the global containment policy was an important item in the regional containment activities through: updating regional guidelines in accordance with GAP II and preparing a country report form for monitoring the national containment activities and laboratory BSL-2/polio monitoring tool to assist containment committees in laboratory verification visits.

The current state of implementation as of October 2002 is as follows.

- Survey completed no inventory needed: Lebanon.
- Surveys completed, inventories awaited: Cyprus, Islamic Republic of Iran, Morocco, Saudi Arabia.
- Laboratory survey in progress: Jordan, Kuwait, Syrian Arab Republic and Tunisia.
- Countries just starting to implement phase I activities: Djibouti (only 7 laboratories surveyed, verification visits are still to be authorized), Egypt, Iraq, Libyan Arab Jamahiriya, Sudan and Republic of Yemen.

Containment activities in Palestine were postponed because of the prevailing conditions. The future regional containment plans are to expedite completion of phase I in all eligible countries where polio transmission has been interrupted, develop a regional monitoring tool for containment and schedule the implementation of regional containment database. The ultimate goal is to have all countries of the Region complete the laboratory survey and inventory phase before regional certification.

7. PRESENTATIONS BY COUNTRIES ON PROGRESS IN POLIOVIRUS LABORATORY CONTAINMENT ACTIVITIES

7.1 Bahrain

*Dr Bader Biag Al Hassan*

Bahrain had its last two cases of polio in 1993. Both were found to be type 1. In December 2000 the national coordinator for containment was appointed. A draft national plan for containment of polio was prepared with WHO consultants in May 2001. This was presented to the national containment committee and endorsed in June 2001. Soon after, a national list of biomedical laboratories was prepared. A questionnaire, along with a covering letter explaining the importance of response, was distributed in July 2001. Responses from all laboratories were received by September and the results were compiled within a week. The central Public Health Laboratory was found to store over 200 samples, some of which
belonged to polio cases from 1993. These samples were removed and destroyed as there was no need for further storage. Stool samples collected for various reasons and stored at the hospital laboratory were also removed and destroyed. None of the other laboratories were found to store any potentially infectious samples. This is because the Public Health Laboratory was for the past 40 years or more the only laboratory responsible for collection and shipment of AFP samples. No other laboratory has been authorized to carry out this task. This concludes phase I of the containment of wild polioviruses and potentially infectious materials.

7.2 Cyprus

Dr Chrystalla Hadjianastassiou

Cyprus has developed a national wild polioviruses containment plan according to the WHO/EMRO regional guidelines for containment of polioviruses. In October 2001 the National Containment Coordinator was appointed, and a draft of the national plan was prepared in November 2001. Phase I containment activities started with the selection and appointment of the National Containment Committee, which endorsed the National Containment Plan. During the period from December 2001 to May 2002, a list of all agencies/laboratories (221) which may hold wild polioviruses infectious or potential infectious materials was prepared. A questionnaire was sent to all laboratories on the national list in order to identify those that store wild poliovirus infectious or potential infectious materials. By the end of July 2002 responses had been received from all laboratories. The responses were analysed, and ten laboratories were selected for verification visits. Analysis of the responses to the survey questionnaire and the verification visits indicated that the virology laboratory of the Cyprus Institute of Neurology and Genetics is the only laboratory storing wild polioviruses for research purposes. None of the laboratories on the national list was found to be holding any potential infectious materials.

A standardized verification form was developed by the national task force in June 2002 and completed by the identified virology laboratory to ensure that it operates at biosafety level 2. The information was verified in August 2002 and the director of this laboratory stated that she is willing to destroy the material once indicated.

The national plan for phase I was completed on 30 August 2002 and approved by the national task force, and the final inventory was submitted to the National Certification Committee (NCC). The NCC approved the inventory on 20 September 2002 and the final country report is to be forwarded to the Regional Certification Commission.

7.3 Djibouti

Mr Said Mohamed Kahin

In Djibouti, eradication activities of polio started in 1997; to date 12 rounds of NIDs has been organized. The last case of poliomyelitis reported in Djibouti was in 1999. Stool samples were negative for polio and the case was only clinically confirmed. Laboratory containment activities were initiated by assigning a national coordinator who is the Director of Laboratories at the Ministry of Health. Due to the limited laboratory capacity in Djibouti, the
national committee for AFP surveillance was asked to reinforce containment activities. The Minister of Health provides the national coordinator with all necessary support for this issue. Only 7 laboratories are listed in the country, 4 public and 3 private. Preliminary survey indicates that none of these laboratories holds any infectious or potential wild poliovirus infectious materials.

Some constraints were encountered due to lack of motivation of laboratory personnel to respond to the survey and cooperate with the national coordinator. The next steps are to update the guidelines for laboratory containment, reinforce the efforts of the national coordinator through authorization to carry out the verification visits and train personnel involved in this issue on appropriate biosafety levels.

7.4 Egypt

Dr Ossama Rasslan

The last confirmed polio case (type 1) in Egypt was recorded in October 2001. The national coordinator for containment was appointed in March 2001. A draft of the national plan was developed by the national coordinator in December 2001. Designation of a national committee with multisectoral membership was achieved in July 2002. The national committee consists of the national coordinator, national task force and facilitators representing different ministries and agencies.

The national plan was approved by the national committee in July 2002. Planned activities include creation of a national list of all biomedical laboratories, development of a survey form, sending the survey form to all laboratories on the national list, and analysing the response received from the laboratories. A database was developed for data management. To date the 7885 laboratories were listed, 6804 laboratories were contacted and 2199 laboratories responded.

The challenges encountered can be attributed to the huge number of laboratories to be surveyed, difficulties in multisectoral cooperation, lack of financial support, lack of administrative support and reluctance of some agencies to respond to the survey. The main obstacle that may impede further progress is related to polio status in Egypt, which dictates the slowing down of further laboratory survey until the polio-free status of Egypt is assured.

7.5 Islamic Republic of Iran

Dr Taha Mousavi Firouzabadi

Laboratory containment of wild poliovirus activities started in 2001 in the Islamic Republic of Iran. The national task force was established in 2001, and regional guidelines were translated and distributed in 2001. The work was done with cooperation of 40 universities of medical sciences. Six awareness-raising meetings were conducted and laboratory survey forms were sent to laboratories in the same year. The national survey was completed in 2002. Further activities to be done are to complete the verification visits, document implementation of BSL2/polio by all identified laboratories and prepare a detailed national inventory compiled from laboratory inventories.
The main challenge is the special attention that is needed for high-risk areas of Sistan va Baluchistan and other areas with high concentrations of refugees from the endemic areas of Afghanistan. Future plans are directed toward the implementation of the containment strategies required for the global certification phase.

7.6 **Jordan**

*Dr Ali Muheidat*

The national containment coordinator and national containment committee were appointed by the Minister of Health. The plan was adopted by the Ministry of Health in April 2001. The national list of laboratories was prepared through official institutions and the members of the national containment committee. The questionnaire and the inventory forms were distributed with teaching materials in May 2001. Responses were received from around two-thirds of the laboratories contacted. The response from two laboratories indicated the possible presence of potential wild poliovirus infectious materials. Site visits are to be made to complete the survey by November 2002. The main constraints are the unavailability of updated lists of private biomedical laboratories and lack of interest of some laboratories in responding to the survey. Financial support and assistance for data management of survey results is requested from the Regional Office.

7.7 **Kuwait**

*Dr Siham A. Al Mufti*

The containment programme was started in 2000. A national coordinator was assigned, and national plan was prepared and approved in 2001. The survey forms were prepared and distributed to all laboratories (governmental and nongovernmental). Most of the laboratories have responded, but responders have been followed up.

The inventory of the National Polio Laboratory Ministry of Health is updated annually. Some delays in response and compliance from laboratories have affected the survey process, which is to be completed by the end of 2002.

7.8 **Lebanon**

*Dr Vandah Barakat*

In Lebanon the last confirmed polio cases were reported in 1994. The national coordinator for laboratory containment was appointed by the Ministry of Public Health in January 2001. The coordinator (director of public health laboratories) is supported by a national containment committee nominated by the Minister of Public Health. A national plan of action was developed and included a timeline for preparation of the national list of laboratories that might possess wild poliovirus infectious and/or potential infectious materials, sending out survey forms, evaluating survey responses and following up inadequate or no responses, visiting subsets of laboratories together with members of the containment committee in order to verify responses and preparation of a report on the data generated to be submitted to the national containment committee for review and endorsement. A comprehensive national laboratory list was established comprising 388 laboratories, which
were subsequently contacted these included 350 clinical laboratories (318 working laboratories, 32 not working), 27 university laboratories, 7 pharmaceutical industries and 4 laboratories affiliated with ministries. A total of 75 laboratories were selected from different regions in order to verify their responses. No laboratories were found to have such material stored; therefore, no national inventory of laboratories holding poliovirus isolates and/or potentially infectious materials is necessary.

The laboratory containment report was sent (end July 2002) to the National Certification Committee with all relevant documents to be forwarded to the Regional Certification Commission.

7.9 **Libyan Arab Jamahiriya**  
*Dr Salem Al-Agili*

The Minister of Health assigned a containment coordinator and nominated members of the national containment committee in January 2002. A national task force has also been assigned including representatives from universities, hospitals, military, agriculture and environment. A survey form is ready for distribution and a team will take the responsibilities of distribution of the survey forms and follow-up on responses. The laboratory survey and inventory Phase I is expected to be completed by October 2003.

7.10 **Morocco**  
*Ms Amal Alla*

The implementation of national containment activities started on March 2001 with the appointment of national coordinator by the Minister of Health preparation of a plan of action, creation of a list of all departments (laboratories) that might hold wild poliovirus infectious or potential infectious materials, preparation of survey form and appointment of a task force.

A total of 354 laboratories were surveyed, all of which responded. Survey responses were thoroughly analysed. The national inventory includes 3 laboratories; laboratories of virology in the Pasteur Institute, laboratories of virology in the Military Hospital and the National Polio Laboratory (NPL). Poliovirus materials held at the Military Hospital were later transferred to the NPL.

7.11 **Oman**  
*Dr Suleiman Al Busaidy*

Oman has successfully completed the implementation of phase I of the WHO Global Action Plan of Laboratory Containment of Wild Poliovirus and Potentially Infectious Materials.

Oman has been polio-free since 1994. High standards have consistently been maintained in both the National Polio Laboratory and the surveillance system, therefore laboratory containment is a top priority since it is a prerequisite to certification.
With strong political commitment and support, the national containment coordinator has effectively managed to promote containment issues and create awareness in various government and nongovernmental institutions including the private sector, through local meetings, workshops and seminars. The laboratory survey was carried out smoothly and the exercise led to preparation of a comprehensive inventory. A total of 134 laboratories were surveyed and 2 laboratories were identified to possess wild polioviruses and/or potentially infectious materials. The details were very well documented in the final report.

The destruction of the material was carried out during 2001 and was witnessed by various government officials, including the Chairman of the National Certification Committee.

All laboratory personnel working in microbiology laboratories or handling potentially infectious material were vaccinated with the IPV (this policy has recently been introduced). In addition the national polio laboratory has recently implemented a restricted access policy by introducing electronic locks to all doors and therefore is now fully operating under biosafety level 2/polio.

7.12 Pakistan

Dr Sohail Zaidi

Pakistan is the seventh most populous country in the world with an estimated population of 145 million. It is divided into four provinces plus the Federally Administered Tribal Areas and Azad Jammu Kashmir. The last two areas have been free of poliovirus for the past two years, but from the remaining four provinces 45 wild polioviruses have been isolated so far in 2002. Containment activities have been postponed until wild virus circulation is interrupted.

A draft of a national plan was prepared in March 2001, during the first intercountry meeting of national containment coordinators, in Cairo, Egypt, and was later submitted to Ministry of Health. No action was taken. The Government of Pakistan is well aware of the importance of containment of wild polioviruses before certification and is fully committed to eradicate poliomyelitis from the Pakistan as soon as possible. However the delay in the approval may be due to continuous circulation of wild poliovirus in the country. Other impeding factors that may affect the implementation of containment plan once virus circulation is interrupted are lack of legislation/licensing authority over private hospitals and diagnostic laboratories, devolution of power to the district governments and problems related to nomination of appropriate personnel. Financial support will be needed once the containment plan is enacted for office equipments including phone, fax and computer, for awareness meetings and for data management staff.

Future plans are to prepare a new containment plan in view of government devolution, have the Ministry of Health approve the plan and start laboratory listing, which is expected to take significant amount of time and thereby have effective implementation of the national plan once poliovirus circulation is interrupted. An STC will be requested for a period of at least two weeks to help in the preparation of survey/inventory plan and also to train staff in the containment database.
7.13 Saudi Arabia  
*Dr Talal Bakir*

The last indigenous transmission of poliovirus in Saudi Arabia was recorded in 1995, and one imported case from a 2 year old Afghani child who acquired the illness from an infected Pakistani visitor was reported in 1998.

OPV3 coverage has been over 90% since 1990. Six NIDs have been implemented since 1995, and one SNID was implemented in 2001. A sensitive surveillance system is in place. The formation of national containment committee with a time-line for implementing the plan was helpful. Several laboratory were visited to verify the responses received, assess BSL and storage conditions and effect destruction of the infectious and potential infectious materials no longer needed by the laboratories. The cooperation of many hospitals and laboratories was appreciated. Meetings with all concerned persons at the central and regional levels as well as letters and field visits were helpful for understanding the situation. The containment measures were applied only for the national poliovirus laboratory in Riyadh, the only laboratory that was found holding infectious and potential infectious materials, which will be destroyed.

7.14 Sudan  
*Dr El Nageeb Saeed*

Sudan, despite being the largest African country and having borders with 9 African countries, many with security problems and large population movements, made great progress in attaining the required levels of OPV immunization through conducting regular NIDs and SNIDs and coordination meetings with neighbouring countries regarding border regions. Satisfactory levels of AFP surveillance (1.5/100 000 population under 15) and adequate stool specimen collection from AFP cases (> 80%) have been achieved. The last wild virus isolation was in April 2001 (from the south).

A national committee for containment of wild poliovirus has been assigned by the Federal Ministry of Health. All major bodies having biomedical laboratories have been represented in the committee. The committee has formulated a national containment plan. Preparation of the national list of laboratories was started in August 2002 and is expected to be completed in October. A task force is currently reviewing the guidelines and forms for survey and laboratory inventory development. Plans have been made for raising awareness among institutions and laboratories to enhance compliance with the survey and thoroughness of response. Support for implementation of activities is expected from the federal government, WHO and UNICEF.

7.15 Syrian Arab Republic  
*Ms Hala Saba*

The national containment coordinator is the director of the National Poliovirus Laboratory. The national task force includes the Minister of Health and representatives from EPI and the public health laboratory. The national containment committee include representative from different ministries. Subcommittees comprised representatives from the
private and public sectors have been assigned. Survey forms were distributed through different committees, and all biomedical laboratories were included in the national list. Responses to the survey are to be evaluated, and computer database management is still to be implemented. To date the NPL is the only viral laboratory identified. A lot of work is still to be accomplished, including following up non-responders, evaluating received responses, implementing the containment database and conducting verification visits.

7.16 United Arab Emirates

Dr Mansour Al Zarouni

The last polio case from the United Arab Emirates was reported in April 1992, from Ajman. The country has achieved greater than 90% OPV coverage since 1992, and greater than 95% since 2000. Five rounds of NIDs were carried out from 1995–1999. AFP surveillance shows continued improvement (non-polio AFP rate of 1.1 in 2001). A national plan for prevention and control of wild poliovirus importation has been approved. Political commitment for laboratory containment was supported by a ministerial decision. Financial resources are available. To achieve the goal of effective containment of wild poliovirus infectious and potential infectious materials in the United Arab Emirates and to regulate implementation of the containment plan, a national coordinator, national task force and focal persons in each medical district were assigned. Regular technical meetings were held. Laboratory survey was completed in 2000, the main findings were: 20 laboratories are diagnostic laboratories, 4 provided simultaneous teaching services and no virology laboratory was identified. Samples from AFP cases are collected at the reference centre: Abu Dhabi Al Jazeria Hospital and sent to the regional reference laboratory in Kuwait. Ongoing activities are being conducted to update the national laboratory list and inventory by the end of 2002. Future activities are to follow up global containment requirements and national containment plan. A visit to the United Arab Emirates by Regional Office staff is expected for evaluation of containment activities.

8. REPORT ON CDC INVESTIGATION OF POTENTIAL WILD POLIOVIRUSES INFECTIOUS MATERIALS

Dr M. Pallansch, CDC

For the purposes of containment, potentially infectious laboratory materials are defined as: faeces, respiratory secretions, and environmental sewage and water samples collected for any purpose at a time and in a geographic area where wild poliovirus (or cVDPV) were suspected to be present, including products of such materials in poliovirus permissive cells or animals.

Although it is completely logical that these materials could contain polioviruses, in some areas this is viewed more as a hypothetical rather than a real problem. For this reason, a study was undertaken to demonstrate the actual presence of polioviruses in these materials.

The reason for this concern is that asymptomatic shedding from infected individuals is very common. Therefore, random sampling of clinical specimens should include some polio positive samples by chance alone. By using information on the time and place where
specimens are collected it should be possible to predict where positive specimens would be encountered. Also because polioviruses are quite stable when stored frozen, they should be viable even with less than ideal storage. Because of higher titre, faecal specimens represent the highest risk.

To test this concept, the investigation used two existing typical stool collections from a viral gastroenteritis laboratory that were collected at a time and from a country with reasonable assurance that poliovirus was circulating, in this case from Pakistan and Bangladesh in 1979 and 1980 respectively. They had been collected for cholera study and for an unknown purpose, respectively, but not for AFP or polio purposes.

The stool specimens were processed and cultured as for typical AFP stool specimens on RD and L20b cell lines. Positive cultures were screened by pan-enterovirus and pan-poliovirus PCR. If they were positive for poliovirus then the serotype was identified by PCR and ITD of the poliovirus isolates obtained by ELISA and PCR. All wild polioviruses were sequenced.

<table>
<thead>
<tr>
<th>Collection</th>
<th>Specimen total</th>
<th>PV1</th>
<th>PV2</th>
<th>PV3</th>
<th>NPEV</th>
<th>NEV</th>
<th>Negative</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>82 stool</td>
<td>3-Wild</td>
<td>3-Wild</td>
<td>0</td>
<td>23</td>
<td>0</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-Sabin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>183 stool</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>78</td>
<td>4</td>
<td>101</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>40 cell cultures</td>
<td>2-Sabin</td>
<td>4-Sabin</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>27</td>
<td>27</td>
</tr>
</tbody>
</table>

In this study, polioviruses and non-polio enteroviruses were isolated from both collections, indicating that these viruses had survived storage for more than 20 years. The non-polio virus enterovirus isolation rate from stool specimens was 31% (23/75) and 43% (78/183) among the non-polio specimens. In addition, the first collection also contained six wild polioviruses of both type 1 and 2. These viruses are being characterized further; however, the type 2 wild viruses are the first ever reported from that country, which now appears to be polio-free. The cell culture materials from the second collection also included polioviruses which had been grown as part of previous investigations on a cell line that allows the propagation of poliovirus.
9. **POLIOVIRUS IN ENVIRONMENTAL SAMPLES**  
*Dr T. Hovi, WHO/EMRO*

All poliovirus-infected individuals, whether presenting with symptoms or not, excrete the virus into the faeces, and thus into the environment, for several weeks. During endemic poliovirus circulation and epidemics, the number of non-paralytic poliovirus excretors may be (several) thousand-fold higher than that of paralytic patients. Because of the several weeks excretion time, asymptomatic virus carriers may spread the virus over long distances from where the paralytic patients are living.

Depending on sanitary facilities and habits of people, different parts of the environment may become poliovirus contaminated. Under developed urban conditions, the houses are normally connected to sewage networks, composed either of closed pipes or at least open canals. The wastewaters are collected through a converging network to sewage treatment plants that process the sewerage by removing particulate matter and part of the pathogenic microbes. The resulting fractions, processed sludge and treatment plant effluent fluid, have reduced concentrations of poliovirus, as compared with the influent. However, most processing techniques used cannot guarantee that either of the fractions is virus free. The processed sludge is often spread on fields as a fertilizer, and it is expected that poliovirus would be rapidly inactivated by temperature, UV light and desiccation. The effluents, if not used for field irrigation, are usually directed into natural water bodies such as rivers, lakes and the sea, where the extensive dilution is likely to reduce the risk of poliovirus infectivity. However, cooling of the temperature and binding of the virus to suspended particulate matter in these water bodies may extend the infectivity period to a few months under optimal conditions.

In the absence of sewerage, again depending on the sanitary arrangements of a given population, faecal material may be either collected in specific pits or containers to be dumped at intervals somewhere in the environment, or already initially distributed on the ground by individual people. From this kind of soil contamination, poliovirus may enter natural water bodies by direct streams, leakage or diffusion and eventually enter ponds, rivers, lakes and sea, and even the groundwater.

Any environmental samples collected during endemic poliovirus circulation or epidemics should be considered potentially containing infectious poliovirus, if stored properly. The risk is obviously very high in the case of known faecal material in the sample and in household sewage. In contrast, the virus would be highly diluted and most likely inactivated, for instance, in natural water bodies contaminated with effluent fluids from sewage treatment plants.

10. **OVERVIEW OF VACCINE-DERIVED POLIOVIRUSES AND IMPLICATIONS FOR CONTAINMENT**  
*Dr J Martin, WHO/EMRO*

Vaccine-derived polioviruses are defined as field isolates consistent with an extensive period of virus excretion or transmission in the community, usually demonstrating 1%–15%
differences from parent OPV strains by full VP1 sequence homology. These include viruses from long-term immune deficient excretors (iVDPVs) and viruses that have been shown to circulate and cause poliomyelitis outbreaks (cVDPVs). The prevalence of long-term polio excretion among immune deficient individuals is low (estimated between 0.1%–1% of patients with B-cell disorders). Outbreaks due to cVDPVs have occurred in communities with low vaccine coverage and poor AFP surveillance. Recognition of the risks associated with VDPV strains emphasizes the need to maintain high levels of vaccine coverage until global polio eradication is achieved and to devise adequate strategies to interrupt OPV immunization after global certification. In the light of the facts described above, VDPV strains are classified as wild for programmatic and containment purposes.

11. DEVELOPMENT OF BIOSAFETY MATRIX ACCORDING TO RISK

Dr S. Hafez, WHO/EMRO

Laboratory biosafety level is a risk tailored design, construction and containment capability of a laboratory in addition to appropriate disciplines and attitudes of laboratory workers. Factors of interest in risk assessment include pathogenicity of the agent, mode of transmission, host range, biological stability, infectious dose, availability of an effective prophylaxis and availability of an effective therapeutic intervention. The risk from polioviruses is dependent on the state of community immunity to polioviruses. Wild polioviruses thus comprise a unique risk group. With high immunization coverage, polioviruses impart little or no individual risk and low community risk. If compliance to vaccination wanes and susceptible populations build up, polioviruses exist: will impart an increasing community risk to reach an exceptionally high risk to the un-immunized community if immunization stops. Two potential risks from polioviruses the risk of inadvertent transmission, and the risk of intentional transmission (bio-terrorism).

The risk of inadvertently transmitting paralytic poliovirus from the laboratory to the community requires 4 conditions to be met: (1) polio infectious material must be present in the laboratory; (2) the workers must be exposed to those virus-containing materials; (3) the worker must be susceptible; and (4) those exposed in the community must be susceptible too. Identifying laboratories holding infectious and or potential infectious materials; properly containing such materials, preferably by destruction; implementing appropriate BSL (BSL-2/polio); protecting laboratory workers handling such materials by full immunization against polioviruses while maintaining high community immunity can deter the risk of inadvertent transmission.

Poliovirus presents a low level risk as a potential bio-terrorism agent. Currently polioviruses have low public health impact as they cause relatively low morbidity and mortality (1% and 0.1% respectively); public fear of polio is low, potential for dissemination to large populations is low because polioviruses are sensitive to dryness and do not survive for long in the environment; and further high immunization coverage reduces the potential to spread the virus. In addition, there is high preparedness to detect and control polio through the effective surveillance programme and the global network of polio laboratories, and vaccine stockpiles are available to counteract and limit any outbreaks.
Plans for the global certification phase can limit the potential use and impact of polioviruses as a bioterrorism agent through effective containment of laboratory stocks of wild polioviruses infectious and potential infectious materials and IPV manufacturing sites, maintaining vaccine stockpiles and production capacity, and maintaining population immunity regardless of strategy used to discontinue OPV, will all provide further assurance against the virus escaping from vaccine production sites, deter possible use of polioviruses as a biological weapon, provide further insurance against poliovirus escape from laboratory stocks and further minimize the risk of emergence of VDPV from one of the rare long-term vaccine virus excretors.

12. REVISED GLOBAL ACTION PLAN

Mr C. Wolff, WHO/HQ

The newest edition of the global action plan is the outcome of recommendations from a WHO consultative group meeting in October 2001, contributions from numerous biosafety experts and laboratory network personnel and suggestions from multiple reviewers. The second edition builds on the basic concepts and objectives of the first edition and the lessons learned from biomedical laboratory surveys and inventories in more than a hundred nations in five of the six WHO regions. It expands on the previous definitions of materials for containment by including vaccine-derived polioviruses (VDPV) and products of such viruses inoculated into permissive cells and animals. It defines biosafety requirements in terms of risks. Finally, it organizes activities leading to containment into three phases: laboratory survey and inventory, global certification and post global certification.

The laboratory survey and inventory phase covers the period when the numbers of polio-free countries and regions are increasing, but wild polioviruses continue to circulate somewhere in the world. In effect, this is the preparatory phase for global certification. The basic activities during this phase are unchanged from the first edition, in agreement with the conclusions from the meeting that the initial survey and inventory strategies fundamentally sound. Laboratories are alerted to the anticipated interruption of wild poliovirus transmission and encouraged to destroy all unneeded wild poliovirus materials. Laboratories retaining such materials are placed on a national inventory.

The global certification phase begins when one year has elapsed without isolation of wild poliovirus from any community or environment anywhere in the world. At this time, laboratories will be notified to implement containment procedures appropriate for the materials used and procedures performed. Documented completion of the containment requirements for the first two phases will be provided to the Regional Certification Commission for review and transmission to the global commission.

Changes from the first edition are most significant in this phase. The second edition updates descriptions of containment facilities and practices. It details laboratory storage conditions and procedures. It requires all laboratories to initiate high-containment (Biosafety level 3 [BSL-3] polio) measures for any activities involving wild poliovirus materials or potential wild poliovirus materials in permissive cells or animals. For all other activities with potential wild poliovirus materials (i.e. faeces, respiratory and environmental samples
collected for any purpose at a time and in a geographical area where wild poliovirus was known or suspected to be present), the requirements remain unchanged. For example, bacteriology and parasitology laboratories and virology laboratories conducting non-replicating procedures may continue to work with potential wild poliovirus materials under BSL-2/polio conditions.

The post global certification phase begins after the global commission has certified the world as polio-free. The second edition recognizes this phase but anticipates that containment measures required for global certification are expected to remain in force as long as universal immunization continues. If immunization stops in some or all countries some time in the future, global biosafety requirements for wild poliovirus materials, oral polio vaccine-like viruses and potential OPV infectious materials are anticipated to become more stringent in keeping with the increased consequences of virus transmission to the community.

13. DOCUMENTATION AND VALIDATION OF RESULTS

Mr. C. Wolff, WHO/HQ

The Global Commission for Certification of Laboratory Containment of Wild Polioviruses has stated that all countries of the world must provide sufficient documentation to demonstrate that all phase I and 2 laboratory containment activities have been completed. The second edition of the Global action plan outlines that sufficient documentation for global certification will include from every country a current national inventory of all laboratories known to be holding wild poliovirus materials, a quality assessment of the survey and inventory process and evidence that laboratories known to be holding wild poliovirus materials meet the required biosafety conditions. Currently, a quality assessment tool is being developed. Field tests have been conducted in 4 countries. The finalized document has been requested by the global certification commission for review and endorsement at their 2003 annual meeting. The tool is currently designed as a self assessment exercise that will be followed by national containment coordinators. The output will be a written document providing an account by the country on all aspects important to high quality implementation of the activities. It is anticipated that this report will be reviewed for approval by national certification committees and then forwarded to regional commissions for polio eradication for review. The process and tool will be finalized only after review and approval by the GCC at their 2003 meeting.

14. GLOBAL PROGRESS TOWARDS CERTIFICATION

Dr E. de Gourville, WHO/HQ

The overall decision to certify global eradication will be made by the Global Commission for Certification of Polio Eradication (GCC), which was established by the Director-General of WHO in 1995. Certification of polio eradication will only be possible when all regions have been certified as polio-free and all required wild poliovirus containment tasks have been completed.

In each WHO region, certification of polio eradication will be granted for the entire region and not for individual countries. Each region has a regional certification commission
(RCC) and each country has a national certification committee (NCC) to facilitate the certification process. Reports flow from NCC to RCC to GCC. Members of GCC, RCC and NCC have no direct involvement in implementation of polio eradication activities.

There are some essential components to the certification process. Generally each country presents evidence via its NCC to convince the RCC of its interruption of indigenous wild poliovirus transmission. Reviewed data are generally those related to: immunization and surveillance performance; details of last polio cases; plans for response to wild poliovirus importation; strength of laboratory support; and laboratory containment of polioviruses. A standard format for reports of the NCC are available as a “certification manual” in most regions.

The Region of the Americas was certified as polio-free in 1994. Following certification, RCC and NCCs were not maintained, NIDs continued in many but not all countries, and there were challenges to maintaining high quality AFP surveillance in some countries. Laboratory containment of poliovirus was not deemed necessary when the Americas was certified as polio-free, and now has to be done retrospectively and before global certification. Containment activities have begun in Canada, United States of America and several countries in Latin America. National containment committees may be used instead of NCCs to present data to a reconstituted RCC in the Americas.

The Western Pacific Region (WPR) was certified as polio-free in October 2000. The first RCC meeting post-regional certification was held in September 2001. Most countries of WPR maintained high quality AFP surveillance and conducted appropriate supplementary immunization activities (SIAs). The RCC urged all WPR countries to finish phase I of laboratory containment of polioviruses. The RCC also urged the Philippines to conduct an appropriate response to a cVDPV outbreak that was detected in 2001. Subsequently that country conducted 2 successful rounds of NIDs, using a house-to-house approach in critical high risk areas.

The European Region (EUR) was certified as polio-free in June 2002. The RCC was satisfied that: indigenous wild poliovirus transmission had not been detected in Europe for more than 3 years; satisfactory progress had been made in laboratory containment of polioviruses; there had been no spread of wild poliovirus following importation of viruses from India into Georgia and Bulgaria in 2001 and countries would be able to detect and rapidly responded to any further importation; and countries of Europe were likely to be able to sustain polio-free status following regional certification.

The South-East Asia (SEAR), Eastern Mediterranean (EMR) and African (AFR) Regions have not been certified as polio-free. In these three regions NCC and RCC structures are in place and countries that have attained polio-free status have started to submit their reports for review by the RCC. All countries of the South-East Asia Region have reached certification quality AFP surveillance. Northern India is the only remaining endemic area. This region still gives highest priority to interrupting transmission; however, RCC/SEAR continues to review documentation from polio-free countries. The high-quality case
The third meeting of the RCC of the African Region in 2002 briefed national certification committee (NCC) members on their function and reviewed progress reports from countries with functional NCC. Emphasis was put on report quality, rather than strength of evidence for certification. The RCC started planning for the review of reports of approximately 8 polio-free countries and addressed the importance of containment progress.

The GCC noted the progress in laboratory containment: 80,000 laboratories had been contacted, and more than 450 laboratories with possible wild virus identified. It stressed the importance of finalizing the guidelines for IPV production, and the publication of the second edition of global containment plan, which is to address the containment of vaccine-derived viruses and better definition of storage conditions. Special attention was paid to validation of containment activities and the need for development of validation tools for possible use by NCCs at country level. The GCC suggested that RCCs, together with regional secretariats, consider assigning sub-committees on validation. GCC asked the secretariat to better define reporting needs on containment (from country to RCC, RCC to GCC).

In April 2002, the GCC noted progress in search for circulating vaccine-derived polioviruses (cVDPV), agreed to laboratory nomenclature, and stressed the importance of using 2 methods for ITD by all RRLs. The GCC commented that cVDPV episodes are a rarity and despite the fact, that retrospective laboratory screening of > 3600 Sabin isolates after the Hispaniola outbreak lead to detection of VDPV in Philippines, and later prospective testing lead to detection of VDPV in Madagascar, yet the GCC reaffirmed that the main GCC objective is to certify interruption of wild poliovirus transmission. The GCC considers it premature to consider expanding the certification mandates to include verification of the absence of cVDPV, although a mechanism will be needed to verify absence of cVDPV following certification of absence of wild poliovirus.

15. REGIONAL PROGRESS TOWARDS CERTIFICATION

Dr F. Kamel, WHO/EMRO

According to recommendations of the global and regional commissions for certification of poliomyelitis eradication, all countries except Somalia have established national certification committees (NCC) with appropriate membership. The revised manual for the preparation of certification reports is being utilized. The NCCs of 15 Member States (Bahrain, Cyprus, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates and Republic of Yemen) that have high quality AFP surveillance and have not reported cases of poliomyelitis for at least 3 years submitted reports and national documentation to the Regional Commission for Certification of Poliomyelitis Eradication (RCC). The RCC has reviewed these reports and provided appropriate feedback. The RCC has also reviewed several annual updates, to be provided by all countries with satisfactory initial reports until regional certification. The RCC continues to guide all aspects of the certification process in the Region. Some of its members
have made country visits to review the status of the certification activities and available
documentation.

16. ISSUES RELATED TO STOPPING POLIO IMMUNIZATION

Dr E. de Gourville, WHO/HQ

The ultimate goal of polio eradication is to interrupt circulation of wild poliovirus on a
global scale. The primary benefit will be elimination of mortality and morbidity associated
with poliovirus infection and a secondary benefit should be savings due to the discontinuation
of polio immunization. The benefits from stopping OPV immunization could be summarized
as: humanitarian, through prevention of adverse events following immunization such as
vaccine-associated paralytic poliomyelitis (VAPP) outbreaks due to circulating vaccine
derived polioviruses (cVDPV), or VDPV causing paralysis in immunodeficient patients
(iVDPV); economic, through benefits attributable to financial savings estimated to represent
US$ 1.5 billion per year; and political, through fulfilling the expectation of WHO Member
States that polio immunization will eventually stop.

There are great challenges to identifying the appropriate strategy for stopping
immunization and managing risks of paralytic polio in the post-immunization era. The
mechanism for decision making for stopping immunization will probably involve evaluation
of programme, policy and scientific data by the Technical Consultative Group (TCG) on
polio, presentation of recommendations of the TCG to the Scientific Advisory Group of
Experts (SAGE) for their consideration and decision-making.

A broad and diverse programme of work has been established and is being implemented
to manage risks of polio in the post-eradication era. Possible sources of polioviruses at that
time will include: cases of VAPP; VDPV from outbreaks or long term immunodeficient
poliovirus excretors; laboratory stocks of stored materials; inadvertent release of wild virus
from IPV vaccine manufacturing facilities; or intentional wild poliovirus release (i.e. bio-
terrorism related incidents). Cases of VAPP and iVDPV could be prevented by stopping OPV
use. There is a plan to commission and implement research to identify drugs that could stop
poliovirus excretion by immunodeficient patients. The programme of work directed at
laboratory containment of wild poliovirus infectious or potentially infectious materials is
aimed at substantially reducing the risk of inadvertent release of polioviruses from
laboratories in the post polio-eradication era through destruction of unneeded materials and
ensuring appropriate biosafety conditions and practices in laboratories that continue to handle
or store risky materials. The risk of intentional release of polioviruses is not quantifiable.

Three scenarios for stopping OPV have been outlined, which are not necessarily
mutually exclusive: 1) stop OPV followed by a ‘surveillance and response strategy’; 2)
replace OPV with IPV in all countries; and 3) develop a ‘new’ polio vaccine. There is reason
to believe that Sabin poliovirus strains will not persist in the environment and that the risk of
VDPV will not be increased if OPV immunization is discontinued. This conclusion comes
from evaluating data from countries where pulse OPV campaigns have been used as the only
mechanism for OPV delivery. Research studies are currently under-way to investigate the
evolution of poliovirus strains in one country following a switch from universal OPV to IPV
use. There is also ongoing evaluation of the Sabin-like isolation rates (to be expanded to include appropriate virological investigations) in weeks following NIDs in low, mid and high risk states in India, and this work may be expanded to other countries.

Concerns about a policy of universal IPV use by all countries will be: health system delivery capacity, especially in developing countries; increased cost; increased potential for adverse effects following immunization; immunogenicity of IPV in developing country conditions; assuring sufficient vaccine supply; and increased risk of inadvertent wild poliovirus release from IPV manufacturing facilities. One possibility to reduce the risk of the latter is for vaccine producers to consider production of IPV from Sabin seeds (S-IPV) rather than wild poliovirus, although this will have implications for development and licensing of new vaccines.

Whatever post polio-eradication immunization strategy is adopted there will be a need for a safeguard in the unlikely event that polio cases occur in the post-eradication era. Plans are in place to develop a stockpile of polio vaccine to be able to respond in such an eventuality. Use of monovalent OPV (mOPV) is an attractive proposition for the stockpile, as it may give faster type-specific immunity and prevent seeding of extra serotypes into a community where response may only be needed to a single serotype. There will be a need to licence mOPV. Other concerns are identification of suitable manufacturers, biosafety in the manufacturing process, size and maintenance of the stockpile, distribution and replenishment of the stockpile.

In summary, a broad programme of work is being implemented by WHO and its partners to define and manage the risks of poliomyelitis in the post polio-eradication era, and to determine the appropriate strategies for stopping polio immunization. Dialogue is under way with policy makers, vaccine manufactures, researchers and public health personnel in order to obtain consensus on issues related to stopping immunization.

17. DEMONSTRATION OF CONTAINMENT DATABASE
   Mr. C. Wolff, WHO/HQ

   The containment database, instructions for its use and analysis automatically generated was demonstrated.

18. WORKING GROUPS

18.1 Discussions

   Group 1: Countries starting containment activities
   Moderators: Dr Javier Martin, Dr Soad Hafez

   This group included Djibouti, Libyan Arab Jamahiriya, Pakistan, Palestine and Sudan. Topics addressed were the key components for successful designing and implementation of containment plans, and the core elements of BSL-2/polio.
Group 2: Countries currently implementing containment activities
Moderators: Dr E. de Gourville, Dr M. Pallansch

This group included Egypt, Jordan, Kuwait and Syrian Arab Republic. Topics addressed were the obstacles encountered, the steps required to overcome identified obstacles, the WHO assistance required and the core elements of BSL-2/polio

Group 3: Countries finalizing Phase I containment activities
Moderators: Mr C. Wolff, Dr H. Asghar, Dr H. van der Avoort

This group included Bahrain, Cyprus, Islamic Republic of Iran, Lebanon, Morocco, Oman, Qatar, Saudi Arabia and United Arab Emirates. Topics addressed were the key components of satisfactory performance, establishing and maintaining a database and backup, containment report writing, the core elements of BSL-2/polio and what to be done next.

18.2 Workshop on containment database
Facilitators: Mr. C. Wolff, WHO/HQ, Dr H. Safwat, WHO/EMRO, Dr A. Middlekoop, WHO/EMRO

A computer laboratory was made available to allow hands-on work with the containment database. Ten computers were made available to give participants a chance for actual data entry and extraction of automatically generated analysis provided by the containment database software.

18.3 Presentations

Countries starting containment activities
Dr Sohail Zaidi, Pakistan

The need for high level political commitment and multisectoral involvement at federal, regional and district levels together with appropriate advocacy are crucial elements of success and should be well taken care of prior to starting the implementation phase of containment activities. Setting a time line for activities and finding funding sources through the Ministry of Health is another requirement. The technical abilities of the containment coordinator and committee in the field of virology, laboratory medicine and polio eradication are crucial. Listing of laboratories will require cooperation with national authorities for laboratory registry; unregistered laboratories should be thoroughly identified and included in the national laboratory list to be surveyed. Prompt evaluation of the response to the survey by National Containment Coordinator and National Containment Committee to follow up on inadequate responses is very important. The purpose of retaining of any poliovirus infectious or potential infectious materials by laboratories, the type of manipulation, the plan for upgrading of laboratory biosafety level and the funding source should be identified in detail in the laboratory inventory.

The biosafety level-2/polio requirements were outlined. Documentation of all containment activities is critical.
Countries currently implementing containment activities
Dr Siham El Mufti, Kuwait

The main obstacles encountered include unregistered laboratories, deficient financial resources and lack of appropriate advocacy for containment which affects compliance with the laboratory survey. There is also need for a containment database.

Countries finalizing phase I containment activities
Dr Vandah Barakat, Lebanon

The key components of satisfactory performance are continuous updating of containment survey results and appropriate data management. Backup copies of the survey and inventory results are also very important, as well as elaborating details while filling in the containment monitoring report. A BSL-2/polio monitoring tool to assist the National Containment Committee in assessment of laboratory biosafety level during verification visits will be invaluable. Next steps should be considered according to individual country conditions.

19. CONCLUSIONS

Great progress has been made in the Region towards the goal of completing all phase I containment activities before regional certification. Overall, countries were very thorough in compiling national laboratory lists, creating awareness of containment strategies and in conducting laboratory surveys. This intensity and quality is acknowledged and should be maintained so that the regional goal of effective containment of wild polioviruses can be achieved.

20. RECOMMENDATIONS

1. All countries of the Region that have not reported polio cases for more than one year and are reasonably assured that indigenous wild poliovirus circulation has been interrupted are strongly encouraged to start implementing containment activities.

2. All countries starting implementation of containment activities should carefully plan their containment and communication strategies taking into account the updated regional guidelines and the second edition of the global action plan to ensure proper implementation of containment activities.

3. All countries currently implementing containment activities should:
   • Identify obstacles hindering the implementation of containment activities and create a plan for overcoming these obstacles.
• Establish a computerized containment database to facilitate management, analysis, and updating of data generated by the laboratory containment process. WHO is expected to provide the technical support required in this respect.

• Establish a national inventory and provide detailed supporting documentation of all laboratory containment activities, to be presented to the National Certification Committee for review and endorsement.

4. All countries that have completed Phase I containment activities should create a plan for regular maintenance and updating of the national containment database and national inventory and submit an annual status report to the National Certification Committee and Regional Certification Commission.

5. Countries should identify laboratories at high risk of receiving clinical materials from individuals recently arriving from polio endemic areas. Periodic contact with these laboratories is required to ensure compliance to BSL-2/polio and that they are not storing this potentially infectious material.

6. WHO should provide countries with the quality assessment tool and the documentation format for reporting containment activities as soon as finalized.
Annex 1

PROGRAMME

Wednesday, 25 September 2002

08:30–09:00  Registration

09:00–09:30  Opening session
Message from H.E. Dr Mohammed Eyad Chatty, Minister of Health, Syrian Arab Republic
Message from Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean
Election of Chairmen and nomination of the Rapporteur
Review of the recommendations of the first intercountry meeting of national containment coordinators for laboratory containment of wild polioviruses and potentially infectious materials/Dr S. Hafez, WHO/EMRO

Session 1: Overview of polio eradication
09:30–09:45  Global status of polio eradication/Dr E. De Gourville, WHO/HQ
09:45–10:00  Regional status of polio eradication/Dr F. Kamel, WHO/EMRO
10:00–10:15  Discussion

Session 2: Overview of polio containment status
10:15–10:40  Global progress in containment strategies/Mr C. Wolff, WHO/HQ
10:40–10:50  Regional progress towards containment/Dr S. Hafez, WHO/EMRO
10:50–11:30  Discussion

Session 3: Presentations by countries on progress in poliovirus laboratory containment activities
11:30–12:00  Bahrain, Cyprus, Djibouti
12:00–12:10  Discussion
12:10–12:40  Egypt, Islamic Republic of Iran, Iraq
12:40–14:00  Discussion

Session 4: Data-based evidence on potential wild poliovirus infectious materials
14:00–14:15  Report on CDC investigation of potential wild polioviruses infectious materials/ Dr M. Pallansch, CDC
14:15–14:30  Poliovirus in environmental samples/Dr T. Hovi, WHO/EMRO
14:30–14:40  Discussion

Session 5  Continuation of country presentations
14:40–15:20  Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya
15:20–15:30  Discussion
15:30–16:00  Morocco, Oman, Pakistan
16:00–16:30  Discussion
Session 6: Continuation of country presentations
16:30–17:00 Palestine, Saudi Arabia, Sudan
17:00–17:10 Discussion
17:10–17:50 Syrian Arab Republic, Tunisia, United Arab Emirates, Republic of Yemen
17:50–18:00 Discussion

Thursday, 26 September 2002

Session 7: Revised global action plan for containment
08:30–08:50 Overview of VDPVs and implications for containment/Dr J. Martin, WHO/EMRO
08:50–09:00 Discussion
09:00–09:15 Development of biosafety matrix according to risk/Dr S. Hafez, WHO/EMRO
09:15–09:30 Revised global action plan/Mr C. Wolff, HO/HQ
09:30–09:45 Discussion
09:45–11:45 Working groups
Preparation/finalization of national plans
Working group 1: Djibouti, Pakistan, Palestine, Sudan, Republic of Yemen
Identification of constraints impeding implementation of national plans
Working group 2: Cyprus, Islamic Republic of Iran, Jordan, Kuwait, Saudi Arabia, Syrian Arab Republic
Working group 3: Egypt, Iraq, Libyan Arab Jamahiriya, Morocco, Tunisia

Session 8: Presentation of working groups
11:15–11:25 Working group 1
11:25–11:35 Working group 2
11:35–11:55 Working group 3

Session 9: Documentation of results and utilization of containment database
12:00–12:15 Documentation and validation of results/Mr C. Wolff, WHO/HQ
12:15–12:30 Demonstration of containment database/Mr C. Wolff, WHO/HQ
12:30–12:40 Discussion
12:40–15:00 Workshop on containment database

Session 10: Containment and certification of poliomyelitis eradication
15:00–15:15 Global progress towards certification/Dr E. de Gourville, WHO/HQ
15:15–15:30 Regional progress towards certification/Dr F. Kamel, WHO/EMRO
15:30–15:45 Issues related to stopping polio immunization/Dr E. de Gourville, WHO/HQ
15:45–16:30 Discussion

Closing session
16:30–17:00 Discussion on conclusions and recommendations
Annex 2

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