

# Report on the 22nd intercountry meeting of national managers of the Expanded Programme on Immunization

Cairo, Egypt, 4–7 July 2005



World Health Organization  
Regional Office for the Eastern Mediterranean

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# Introduction

## 1. Introduction

The Twenty-second Intercountry Meeting of National Managers of the Expanded Programme on Immunization (EPI) in countries of the World Health Organization (WHO) Eastern Mediterranean Region and of the United Nations Children's Fund (UNICEF) Middle East and North African Region was held in Cairo, Egypt, on 14–17 July 2005. The meeting was attended by WHO and UNICEF staff from the field, regional offices and headquarters and by national EPI managers from Afghanistan, Bahrain, Djibouti, Egypt, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen. Also present at the meeting were representatives of the Centers for Disease Control and Prevention (CDC) Atlanta, Canadian International Development Agency (CIDA), Global Alliance for Vaccines and Immunization (GAVI) secretariat, GlaxoSmithKline Biologicals, Health Ministers' Council for the Cooperation Council States, Network for Education and Support in Immunization (NESI), Rotary International, United States Naval Medical Research Unit No.3 (NAMRU-3) and the World Bank. The objectives of the meeting were to:

- ❖ review national and regional progress, achievements and constraints of EPI;
- ❖ discuss and introduce new concepts and recent advances in respect to new vaccines, immunization and target diseases control, and elimination and eradication strategies and activities;
- ❖ discuss and recommend activities to improve access to high quality and safe routine immunization services and to strengthen national and regional vaccine-preventable diseases control, elimination and eradication initiatives.

The Eighteenth Meeting of the EPI Regional Technical Advisory Group (RTAG) was also held during the same period to review the situation of the EPI and advise on ways and means of achieving its objectives. Members of the EPI RTAG also participated in the intercountry meeting.

Dr Mahendra Sheth, Regional Health Adviser, UNICEF/Middle East and North African Region (MENARO), delivered a message from Mr Thomas McDermott, Regional Director, UNICEF/MENARO. In his message, Mr McDermott welcomed the participants and commended the tireless fieldwork of EPI managers. He noted that UNICEF's strategic plan for the accomplishment of the Millennium Development Goals identifies immunization as a major thrust of UNICEF's work in reducing child mortality. He highlighted the return of polio

in the Region and identified weak routine immunization activities that are not supported by strong communications programmes as the major area that needed strengthening.

Mr McDermott observed that although most countries of the Region had done well in maintaining routine immunization, while at the same time selectively using campaigns to increase coverage in neglected areas, a few countries had allowed routine immunization to deteriorate and relied on periodic campaigns instead. He underlined the importance of having a firm base of primary health care services in place that can reasonably support delivery of routine immunization services.

Mr McDermott highlighted that the absence of good public awareness was a major factor behind the polio outbreak in Nigeria, and noted that several areas of the Eastern Mediterranean Region were not dissimilar. It was, therefore, necessary that communication issues should be addressed at regional, national and community levels. There had been promising community education initiatives, working through local leaders and institutions, and these should be expanded upon. However, the fastest, and perhaps most effective, means of communications in the Region probably involved regional television networks and other broad media approaches.

Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean, addressed the meeting and noted that, despite the availability of effective prevention and control measures, communicable diseases were still responsible for around one third of all deaths and illnesses in the Region. He underlined the seven visions of the Division of Communicable Diseases Control, which focused on particular disease-specific challenges that were achievable through a strong and well-integrated primary health care framework. Two of these seven visions related to the area of vaccine-preventable diseases and immunization. Dr Gezairy stressed that all the ingredients necessary for materializing these visions were in place: highly potent and safe vaccines; very efficient techniques; technologies and strategies that allow immunization services to be extended to the most remote populations; and considerable financial resources. What was needed, he added, was the strong engagement of country governments and better coordination between partners. He stressed that the role of the global community was not only to develop vaccines and invent new technologies, but also to make sure that all children in the Region have access to immunization.

Dr Gezairy commended the 16 countries that had succeeded in reaching and sustaining high routine immunization coverage at national as well as district level, in sustaining

## Twenty-second meeting of national EPI managers

polio eradication, in greatly reducing measles transmission and in introducing new vaccines. In six countries of the Region, however, national immunization programmes had remained below the optimum level of performance, with low access to routine immunization services and consequently had a persistent high burden of vaccine-preventable diseases. The main barriers to change were not financial, he noted, but were instead the result of weak engagement on the part of national governments and lack of ownership, responsibility and accountability. Regional efforts to support the priority countries during the past three years had included advocating with senior officials to raise the issue of routine immunization, supporting implementation of district microplans to improve access to EPI services, and supporting the development of multi-year plans, in line with the specific country situation, the national health system master plan, as well as with the regional and global immunization vision developed by WHO and UNICEF.

Dr Gezairy concluded his address by acknowledging progress that had been made regarding regional measles and rubella elimination and control strategy, expansion of immunization to other target age groups, maternal and neonatal tetanus elimination, and improved capacity to document disease burden and make evidence-based decisions on new vaccine introduction.

The agenda, programme and list of participants are included as Annexes 1, 2 and 3, respectively.

# Scope of the Expanded Programme on Immunization

## 2. Scope of the expanded programme on immunization

### 2.1 Regional vision: the way forward

*Dr Z. Hallaj*

Despite great progress in the field of medical technology and good efforts made in prevention and control of communicable diseases, these diseases continue to be the leading cause of morbidity and mortality in the Eastern Mediterranean Region. Communicable diseases kill 1.3 million people every year, constituting 32% of total deaths in the Region. Many of these diseases are preventable and curable.

The ultimate goal of WHO is to ensure that no person in the Region dies or seriously suffers from a communicable disease that is preventable or curable. To achieve this, the Regional Office relies on the effective use of an essential package of prevention and treatment activities that can be delivered through the primary health care network in any country, focusing on what is practical and achievable and ensuring equitable health service delivery.

The Regional Office has identified seven visions for the Region that focus on disease-specific challenges.

1. Elimination and eradication of specific diseases including lymphatic filariasis, dracunculiasis, leprosy, and diseases that can be prevented by childhood vaccination, such as measles and maternal and neonatal tetanus.
2. To expand malaria-, schistosomiasis- and leishmaniasis-free areas and achieve an onchocerciasis- and trypanosomiasis-free Region
3. To provide safe vaccines for every child so that none die from a vaccine-preventable disease.
4. To curb the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) epidemic through making antiretroviral therapy available to all and adopting the comprehensive package available for prevention and care of HIV/AIDS.
5. To halve the burden of tuberculosis and work towards elimination through expanding use of directly observed treatment strategy.
6. To contain new and re-emerging disease threats through adequate preparedness at regional and national levels.
7. To ensure provision of safe food to all people in order to significantly reduce the health and social burden of food-borne disease.

These goals are achievable and are based on scientific strategies that have proved successful in many parts of the world, as

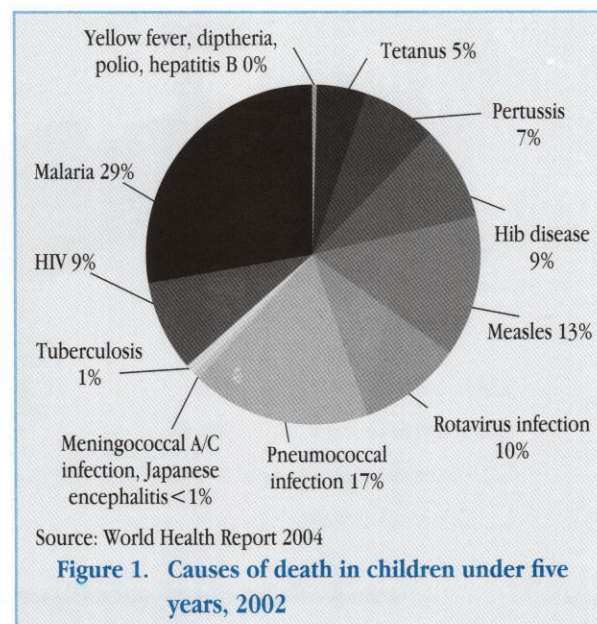
well as in several countries of the Region. The Division of Communicable Disease Control is committed to helping accomplish these visions and realizing the ultimate goal through timely implementation of the necessary activities.

### 2.2 EPI global overview and Global Immunization Vision and Strategies

*Dr Okowo Bele*

Despite achievements made in the area of immunization, the number of children suffering and dying from vaccine-preventable diseases is still relatively high, (Figure 1) mainly because of low access to routine EPI in several parts of the world (in 2003, approximately 27 million infants had not received their basic vaccines). In order to address accessibility issues, to reduce disparities between and within countries, and to increase access to new vaccines and technologies WHO and UNICEF developed the draft Global Immunization Vision and Strategy (GIVS) offering a unifying vision for 2006–2015.

In May 2005, the 58th World Health Assembly endorsed GIVS and issued a resolution on global immunization strategy (WHA58.15) that urged Member States to meet immunization targets and ensure that immunization remains a priority on the national health agenda. Countries were to adopt GIVS as the framework for strengthening EPI between 2006 and 2015, with the goal of achieving greater coverage and equity in access to immunizations, of improving access to existing and future vaccines, and of extending the benefits of vaccination to age groups beyond infancy. In the resolution, the Assembly also requested the Director-General to:



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- ❖ mobilize resources to promote the availability and affordability of future new vaccines, based on evidence of epidemiological profiles;
- ❖ work closely with GAVI, UNICEF and other partners to provide support to Member States in implementation of the GIVS;
- ❖ strengthen relations at global, regional and sub-regional levels with UNICEF, GAVI and other partners in order to mobilize the necessary resources for countries, in particular developing countries, to implement the GIVS;
- ❖ report every three years to the World Health Assembly on progress towards achievement of global immunization targets.

In brief, GIVS focuses on four strategic areas.

1. **Protecting more people in a challenging world**, through ensuring at least four immunization contacts per year (using the reaching every district approach and targeting the un-reached), expanding target groups beyond infancy, appropriate use of campaigns and strengthened vaccine management practices.
2. **Introducing new vaccines and new technologies** through strengthening country capacity for evidence-based decision-making, ensuring availability of vaccines (particularly for the disadvantaged) and improving research and development for needed vaccines.
3. **Integrating immunization with other health interventions**, addressing system barriers, exploring and implementing appropriate linkages and expanding surveillance.

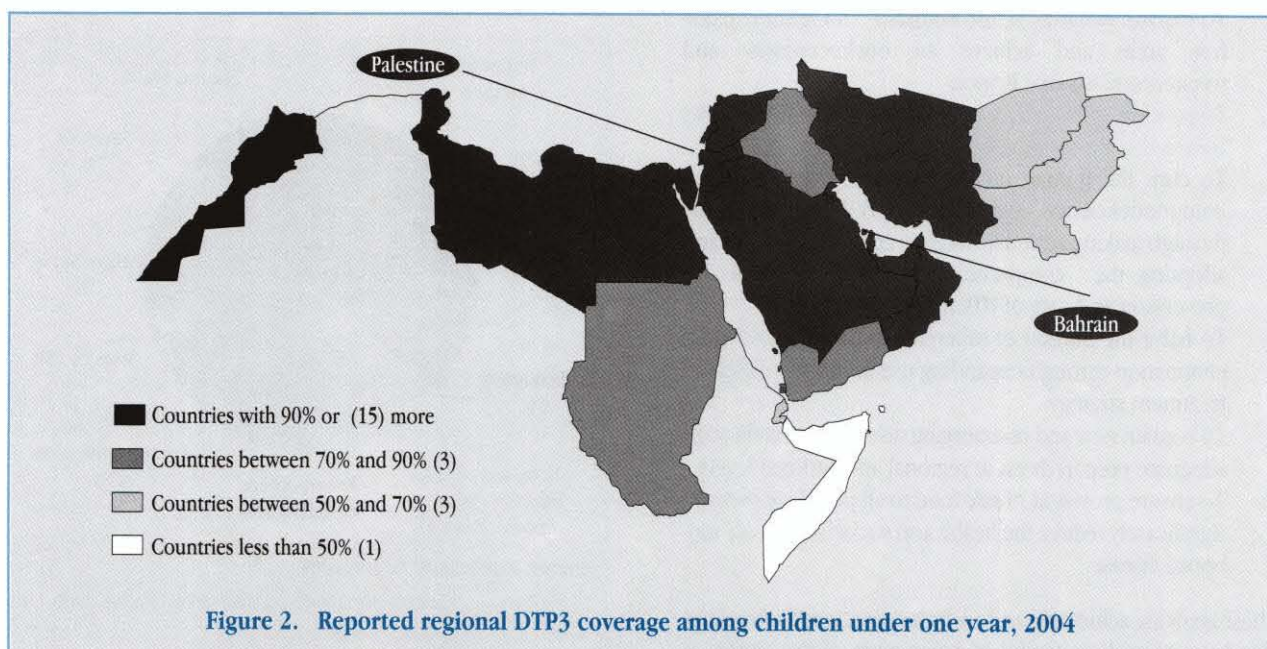
4. **Immunizing in the context of global interdependence**, through increasing awareness of interdependence and by strengthening and coordinating partnerships.

Worldwide implementation of the proposed strategies will achieve the GIVS goal of two-thirds global reduction in childhood morbidity and mortality as a result of vaccine-preventable diseases by 2015 compared to 2000. Implementing GIVS will, however, result in rising costs in immunization and the main challenge will be making the necessary resources available.

### 2.3 Regional EPI overview and status of implementation of the recommendations from the 21st meeting

*Dr Said Youssouf*

By the end of 2004, 15 countries in the Region had achieved routine diphtheria/pertussis/tetanus (DPT3) coverage of more than 90% (Bahrain, Egypt, Islamic Republic of Iran, Jordan, Kuwait, Libyan Arab Jamahiriya, Morocco, Oman, Palestine, Qatar, Syria, Saudi Arabia, Tunisia, United Arab Emirates). Three countries had 70%–90% coverage (Iraq, Sudan, Yemen) and four countries had less than 70% coverage (Afghanistan, Djibouti, Pakistan, Somalia). However, during 2004, DPT3 coverage had improved in Afghanistan, Iraq, Sudan and Yemen compared to 2003 (Figure 2). Of the unimmunized children in the Region, 90% continue to be in the priority countries: Pakistan 50%, Sudan 14%, Afghanistan 9%, Iraq 7%, Somalia 7% and Yemen 4%.



## Scope of the Expanded Programme on Immunization

Improving routine immunization coverage is the first priority. This is to be achieved through the “reach every district” (RED) approach, district microplanning, vaccine management, financial sustainability and recruiting national and international staff at country level to support routine immunization. Regular country visits in order to monitor and evaluate performance will be undertaken.

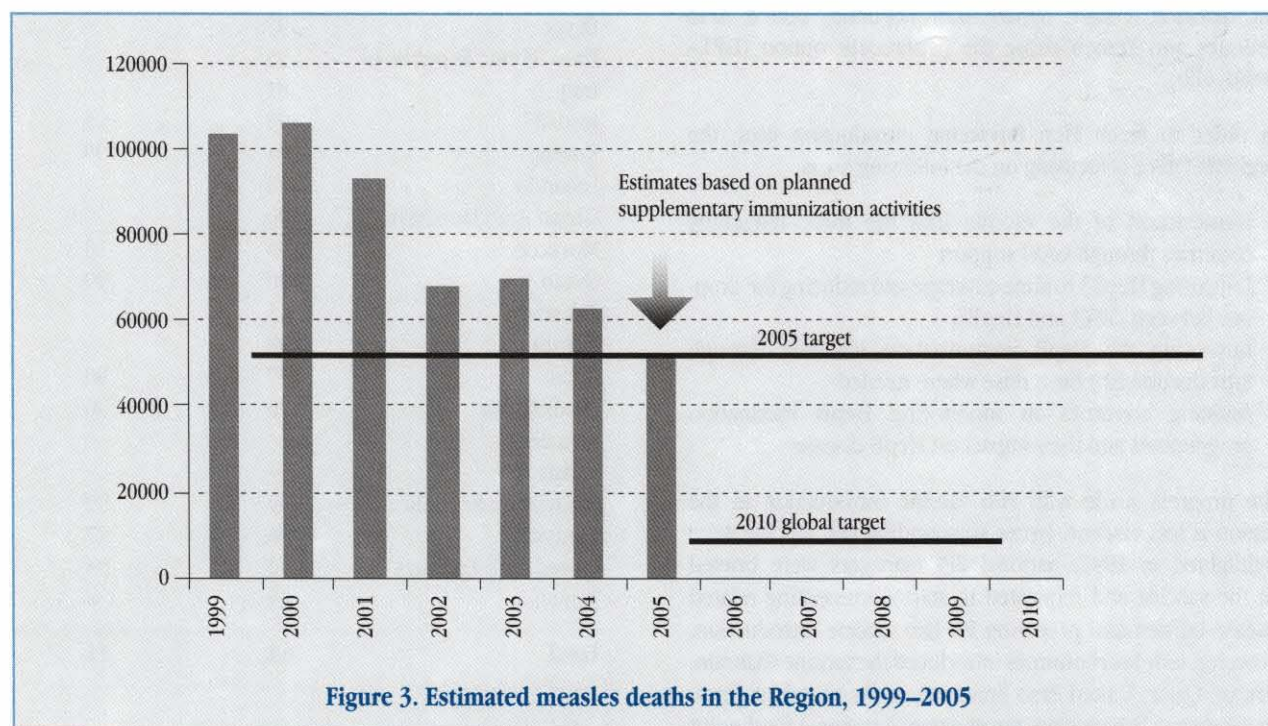
Measles elimination activities are ongoing: 16 countries are currently in the elimination phase, while six countries need to accelerate their activities. Measles catch-up campaigns have been conducted in 15 countries, four countries are planning implementation before the end of 2005 and three countries will be implementing in 2006. There is very low measles transmission in 13 countries and the Region has achieved the global target of measles mortality reduction by end 2005 (Figure 3).

The global target of maternal and neonatal tetanus elimination has been achieved in 15 countries in the Region; three countries are close to elimination (Egypt, Iraq and Yemen), and only four countries have not yet eliminated (Afghanistan, Pakistan, Somalia, Sudan).

The introduction of new vaccines has gained momentum. Hepatitis B (Hep B) vaccine has been integrated into the EPI schedule of 19 Member States with a regional coverage of 64%. The introduction of Hep B was supported by GAVI in Pakistan, Sudan and Yemen. *Haemophilus influenzae* type b (Hib) vaccine has been introduced in 11 out of 15 countries with demonstrated disease burden.

The regional network for bacterial meningitis surveillance, launched in 2004, is expanding to cover more countries and more sentinel sites. It is expected to generate reliable data on Hib, streptococcal pneumonia and *Neisseria meningitidis* disease burden, to support evidence-based decisions on vaccine introduction and to monitor the impact of the new vaccines. A regional network for the surveillance of other invasive pneumococcal diseases is due to be launched, building on the ongoing bacterial meningitis surveillance network.

The regional network for rotavirus surveillance, launched late 2004, is being implemented to document burden of rotavirus gastroenteritis and thereby support evidence-based decisions on introduction of rotavirus vaccines.



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### 3. New vaccines

#### 3.1 New vaccines introduction: regional progress, challenges and perspectives

*Dr Ezzeddine Mohsni*

The regional goal is that all countries should have introduced hepatitis B (HepB) vaccine, and those countries with a demonstrated high *Haemophilus influenzae* b (Hib) disease burden and a reliable routine immunization system should have introduced Hib vaccine, by end 2007.

Much progress has been made in the Region regarding the introduction of HepB vaccination. All countries have introduced the vaccine, with the exception of Afghanistan, Djibouti and Somalia. Accordingly, the regional percentage of infants living in countries where HepB vaccination is provided through the routine immunization system has increased from 46% in 2002 to 90% in 2005. However, regional coverage with three doses of HepB (HepB3) remained low (62% in 2004) mainly because the vaccine had not yet been introduced in Sudan and Yemen. Thirteen countries are using a monovalent HepB vaccine, while Egypt is using a tetravalent DPT–HepB, and Bahrain, Oman, Syrian Arab Republic, United Arab Emirates and Yemen chose the pentavalent option (DPT–HepB–Hib).

In order to reach Hep B vaccine introduction goal, the Regional Office is focusing on the following areas.

- ❖ Introduction of the vaccine into the three remaining countries through GAVI support
- ❖ Improving HepB3 routine coverage and reducing the drop-out between DPT3 and HepB3.
- ❖ Improving the HepB immunization schedule through introduction of a birth dose where needed.
- ❖ Assisting countries in monitoring HepB vaccination programmes and their impact on HepB disease.

The progress made with Hib vaccine introduction in the Region is less evident. Issues surrounding Hib vaccine were highlighted in 1997; national EPI managers were briefed on the vaccine and requested to start documenting related disease burden and preparing for Hib vaccine introduction. However, only four countries introduced the vaccine (Bahrain, Kuwait, Qatar, United Arab Emirates) in the next four years. To accelerate Hib vaccine introduction, a regional focal point was recruited in 2000 and efforts aimed at demonstrating the disease burden were intensified, using the WHO rapid assessment tool. Consequently, 10 rapid assessments tools have been conducted in 10 countries. It was found that

information on Hib disease burden is in fact available in all countries except Afghanistan, Djibouti, Iraq, Palestine and Somalia. There was a demonstrated moderate to high burden in 16 countries, and vaccine had been introduced in seven additional countries. In total, 11 countries were efficiently using the vaccine in their routine immunization programme (Table 1). In all of these, reported coverage figures exceeded 95% and Hib meningitis incidence had been drastically reduced.

In summary, there are four groups of countries facing various challenges.

**Table 1. Immunization coverage by country with hepatitis B and Hib vaccines**

| Country                   | HBV3 coverage (%) | Hib coverage (%) |
|---------------------------|-------------------|------------------|
| Afghanistan               | –                 | –                |
| Bahrain                   | 98                | 98               |
| Djibouti                  | –                 | –                |
| Egypt                     | 97                | –                |
| Iran, Islamic Republic of | 95                | –                |
| Iraq                      | 81                | –                |
| Jordan                    | 95                | 95               |
| Kuwait                    | 94                | 98               |
| Lebanon                   | 88                | –                |
| Libyan Arab Jamahiriya    | 100               | –                |
| Morocco                   | 95                | 10               |
| Oman                      | 100               | 99               |
| Pakistan                  | 65                | –                |
| Palestine                 | 98                | –                |
| Qatar                     | 97                | 96               |
| Saudi Arabia              | 96                | 96               |
| Somalia                   | –                 | –                |
| Sudan                     | –                 | –                |
| Syrian Arab Republic      | 99                | 99               |
| Tunisia                   | 96                | 97               |
| United Arab Emirates      | 92                | 94               |
| Yemen                     | 49                | –                |
| <b>Total</b>              | <b>64</b>         | <b>11</b>        |

HBV3 Three doses of hepatitis B vaccine

– Not introduced

– Recently introduced

## New vaccines

1. The first group is the 11 countries that have already introduced Hib vaccine. The main challenge for this group is to strengthen surveillance systems to demonstrate disease impact and thus maintain the commitment of national decision-makers. There is also a need to expand surveillance to document pneumococcal invasive disease burden.
2. The second group has a high burden, but Hib vaccine has not yet been introduced. The challenge for Djibouti and Sudan is to introduce the vaccine through GAVI support and improve surveillance; both countries are planning to submit proposals to GAVI in 2006. Egypt and Morocco need to improve the surveillance system to allow evidence-based decisions, by confirming disease burden and demonstrating cost-effectiveness of vaccine introduction. Libyan Arab Jamahiriya aims to improve surveillance systems so as to be ready for vaccine introduction on 2006.
3. Five countries have an unknown disease burden and are therefore having to improve their surveillance system to allow evidence-based decision-making. Pakistan conducted a rapid assessment tool in 2003 and has population-based surveillance in progress, however the results are not yet decisive. In Iraq, Hib vaccine introduction is being considered and there is a need to improve surveillance and identify baseline situation. The burden of disease in Somalia seems to be high, however there is currently no surveillance system and the country is not yet eligible for GAVI support.
4. So far, only the Islamic Republic of Iran falls into the low disease burden group. The challenge for this country is to improve the surveillance system and expand it to cover other bacterial meningitis pathogens and to allow evidence-based decisions (document related disease burdens, circulating serotypes, costing studies, etc.).

Regional experience with Hib vaccine introduction has therefore confirmed the main conclusions of a 2002 study (World Bank/McKinsey) on new vaccine introduction decision factors: proven local disease burden; proven safe and effective vaccine; convincing health economics; limited negative effect on existing vaccines; support from local clinical opinion leaders; and no resistance from general practitioners and parents. However, a further prerequisite has been revealed without which newly introduced vaccines, in particular expensive ones such as Hib, cannot be sustained: the availability of an adequate and strong surveillance system to monitor and demonstrate the impact of vaccine introduction on disease burden and to ensure the decision-makers commitment to new vaccines introduction.

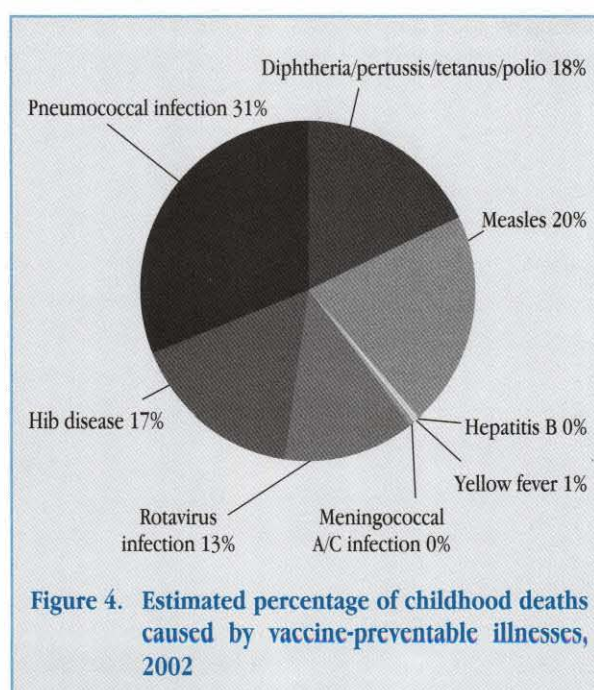
### 3.2 Burden of disease assessment for new vaccine introduction: regional networks

*Dr Nadia Teleb*

Diarrhoea, pneumonia and meningitis are among the leading causes of child mortality worldwide; the Eastern Mediterranean Region is no exception. WHO estimates that there are 2.7 million childhood deaths annually resulting from vaccine-preventable illnesses, more than 60% of these deaths are caused by three organisms, namely *Streptococcus pneumoniae* (31%), Hib (16.7%) and rotavirus (12.5%). Effective vaccines against these agents are either available or are being developed. However, introduction of new vaccines in the Region, particularly to the countries that need them most, is usually delayed thus depriving many children of a life-saving public health intervention (Figure 4).

Reliable data on disease burden and cost-effectiveness are necessary for evidence-based decision-making on introduction of the available vaccines or vaccines in the pipeline. Such data are also necessary for evaluating impact of introduced vaccines on disease occurrence. Therefore, the Regional Office is establishing regional networks for laboratory-based surveillance and assessment of burden of bacterial meningitis, pneumococcal and rotavirus disease in countries of the Region. The networks will also aim to:

- ❖ provide common protocol, methods and standards for the participating countries;



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- ❖ share information, experience and resources;
- ❖ assist in human resource development;
- ❖ facilitate provision of necessary supplies;
- ❖ support quality control/quality assurance;
- ❖ mobilize financial resources from different partners;
- ❖ assist in building infrastructure for long-term use.

The bacterial meningitis surveillance network, launched early 2004, now covers several countries of the Region. Sentinel surveillance is currently functional in four hospitals in Sudan, six hospitals in five governorates in Yemen, four hospitals in four provinces in Pakistan and seven hospitals in five governorates in the Syrian Arab Republic. Population-based surveillance is ongoing in Shiraz, Islamic Republic of Iran, and four sentinel sites have been added in four provinces. Sentinel surveillance is still ongoing in seven sites in Egypt. Four sentinel sites have been selected in Morocco and will be functional soon. Population-based surveillance of bacterial meningitis is being revitalized in Tunisia to provide data necessary to document impact of the introduced Hib vaccine. Regular reports are received from other countries that run national laboratory-based surveillance of bacterial meningitis, such as Lebanon, Oman and Qatar.

Through the network, technical support has been provided to different countries to select the suitable sentinel sites for laboratory-based surveillance (Figure 5). The countries were assisted in conducting national training workshops to train staff on laboratory-based surveillance of bacterial meningitis. Laboratory supplies, equipment and operational

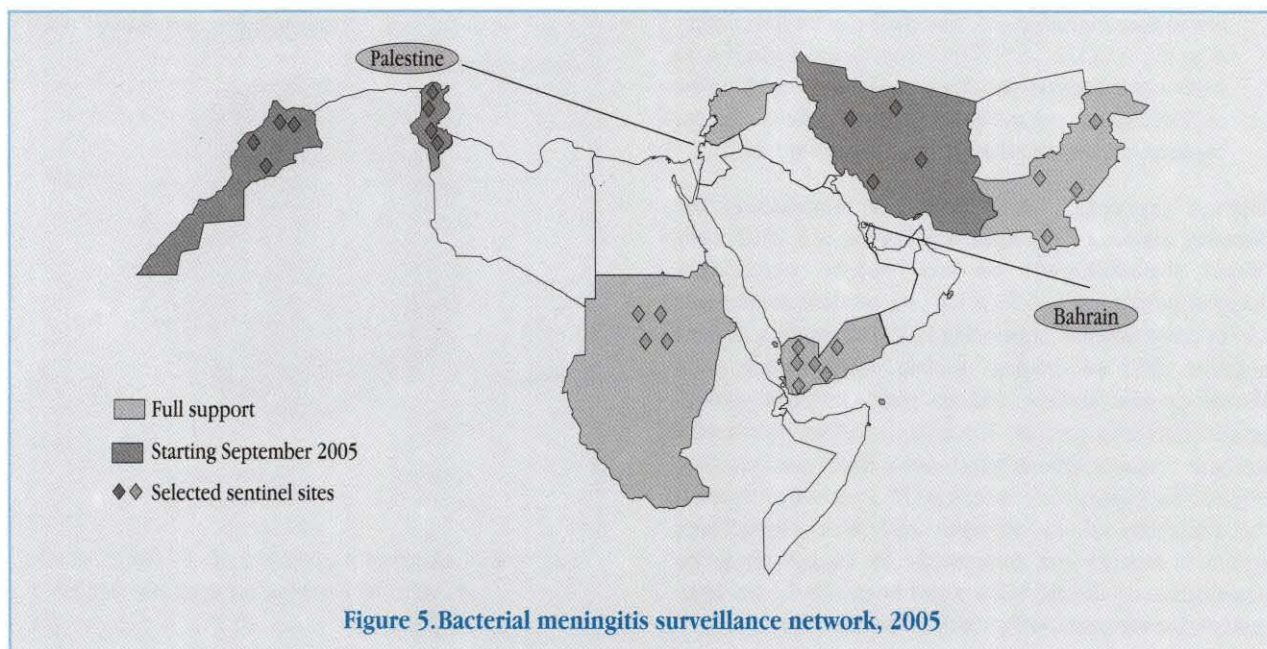
costs are continuously provided in several countries. Regional guidelines on laboratory-based surveillance of bacterial meningitis and a computer application for bacterial meningitis surveillance have been developed. The network is supported by NAMRU-3, the WHO collaborating centre in Cairo, Egypt. Surveillance of invasive pneumococcal diseases, namely pneumococcal pneumonia and sepsis, in addition to pneumococcal meningitis, will be built upon and included as an integrated part of the bacterial meningitis network.

The establishment of a rotavirus surveillance network is ongoing (Figure 6). The Eastern Mediterranean Rotavirus Working Group (EMRWG), was formulated to provide the necessary technical and financial support to the network. The working group includes relevant partners, namely, the Rotavirus Vaccine Program at the Program for Appropriate Technology in Health (PATH), CDC Atlanta, NAMRU-3, rotavirus vaccine producers (GlaxoSmithKline Biologicals and Merck and Co Inc.) in addition to WHO. Proposals from nine countries were submitted to the Regional Office and technical guidance was provided by the EMRWG for amendments. Technical and financial support will be provided by EMRWG for participating countries and the network is expected to be operational in the fourth quarter of 2005.

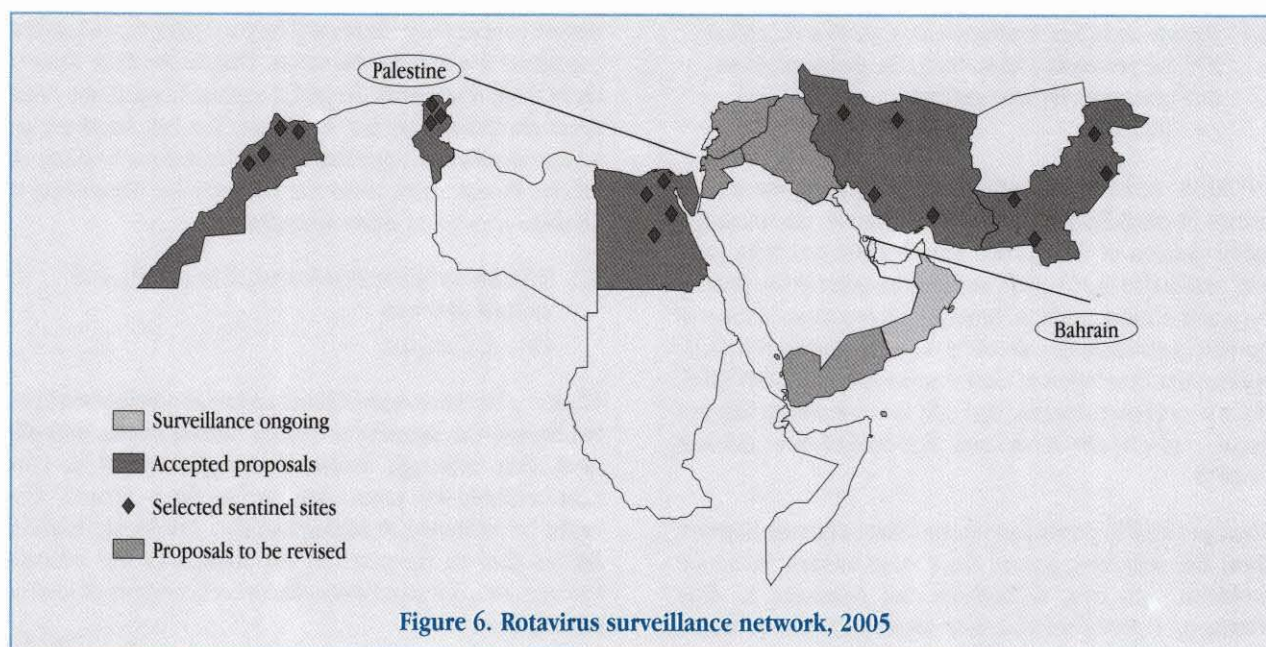
### 3.3 Update on global vaccine supply and availability

*Francisco J. Blanco*

A sustainable supply of vaccines is essential to achieve the benefits of immunization. In response to changes in the



## New vaccines



vaccine market that have put the availability of EPI vaccines at risk, UNICEF adopted the principle of vaccine security as a strategy to ensure an uninterrupted sustainable supply of affordable vaccines of assured quality. The basic pillars of vaccine security are accurate forecasting, definite funding and contracting of affordable vaccines. The results of the last tender conducted in 2003 showed a reversal of the reduction in availability and manufacturers, resulting in a healthier and more responsive market. However, price increases were observed causing wide price variations for most vaccines.

The introduction of HepB and Hib vaccines, with GAVI support, has resulted in increased volume of procurement for these vaccines. While the availability of HepB vaccine remains good, that of combination vaccines has been limited resulting in a barrier for introduction up to 2004. The availability of DTP–HepB and DTP–HepB+Hib increased in late 2004 allowing their introduction into 10 new countries in 2005. New manufacturers are pursuing prequalification and it is expected that the market will open up in 2006–2007.

UNICEF procures vaccines regularly for 54% of children in the Eastern Mediterranean Region. A number of countries have mechanisms for production and procurement of vaccines, and UNICEF collaborates with these when special circumstances warrant assistance (particularly for campaigns). For vaccines supplied by UNICEF for routine programmes, an increasing level of procurement through procurement services (with funding from governments and GAVI) has been experienced in recent years.

Countries of the Region have successfully implemented the Vaccine Arrival Report with 80% inspection and reporting in 2003, the first year of introduction, increasing to 88% in 2004. This implementation is an important step in ensuring the quality of vaccines used in the programmes, as well as allowing UNICEF the opportunity to improve the delivery of vaccines.

### Discussion

Participants discussed regional networks for specific disease surveillance and the current situation of vaccine-preventable diseases surveillance. It was agreed that vaccine-preventable diseases surveillance remains weak in some priority countries and many of the current surveillance systems in the Region are redundant. However, in order to enable countries to make informed decisions regarding new vaccines introduction, accurate data are required.

Participants raised concerns about the price of new vaccines; need for conducting more cost-effectiveness studies in the Region; and the international market situation in terms of availability of some vaccines, both standard vaccines and some of the combination vaccines.

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### 3.4 Update on latest development in priority vaccines: HIV, tuberculosis and malaria, the global problem and prospects for intervention

*Dr Oya Afsar*

HIV/AIDS, tuberculosis and malaria are among the top 10 causes of disability and mortality worldwide, constituting a major portion of the global burden of disease. Most cases and deaths due to HIV/AIDS and malaria occur in the poorest countries, mainly in Africa. Tuberculosis creates an additional burden in communities already susceptible due to HIV/AIDS. Millennium Development Goal 6 seeks to combat HIV/AIDS, malaria and other diseases, and calls for countries to halt and begin to reverse the spread and incidence of these diseases by 2015.

Strategies exist to prevent and control these diseases, however these can only avert part of the disease burden. There are problems with cost, accessibility and resistance to drug treatment. Operational strategies, such as insecticide-treated mosquito nets, condoms and behavioural changes, require compliance of the community and may not reach the most susceptible groups. Bacillus Calmette–Guérin (BCG) vaccine is not so effective in protecting adults against pulmonary tuberculosis. Therefore, developing vaccines against these diseases is required to obtain a marked improvement in disease control efforts.

Development of vaccines for these diseases seems feasible, as the immune system is already known to control the diseases under certain circumstances. In addition, experimental vaccines have been shown to produce some immunity both in animal models and in human clinical trials. However, there are several challenges to vaccine development. Firstly, knowledge is lacking regarding the mechanisms of an effective immune response needed for protection. Secondly, the relevance of the results of animal experiments to protection in humans is not exactly known. In the case of HIV, there are many subtypes in the world and the virus is capable of undergoing extensive genetic changes in a short period of time. Moreover, HIV infects the very cells that are required to function fully in order to constitute an effective immune response. In the case of malaria, the antigenic structure of the parasite and the immune interactions with the host organism are so complex that it is difficult to develop a single vaccine.

Numerous scientific studies are being carried out in various parts of the world to address these challenges. Leading areas of research include: genetic variability of the agents, mechanisms that constitute an effective immune response, and the trials of a variety of vaccines designed to target different stages in the

disease course. Such studies will help to clarify the factors that contribute to protective immunity. Despite the huge share of these three diseases in the global disease burden, the funds spent on research are not significant. The fact that there are a large number of organizations and initiatives working on vaccine development raises the necessity for networking to combine efforts and create synergies.

### 3.5 Briefing on latest developments in cholera and typhoid vaccines

*Dr G.L. Chaignat*

Cholera, shigellosis, typhoid fever and rotavirus gastroenteritis are behind the occurrence of 2.85 million deaths annually worldwide. Although cholera and typhoid vaccines have been available for years, their use so far is limited. This might be attributed to inadequate data on disease burden, limited data on the potential effectiveness of the available vaccines, or inadequate cost–effectiveness analysis of vaccine introduction.

WHO recommendations on use of the two available typhoid vaccines are that: immunization of school-aged children should be limited to geographical areas where typhoid fever is a recognized public health problem and areas where antibiotic-resistant strains are particularly prevalent; and use of typhoid vaccines in an outbreak situation could be a possibility in the future.

There are currently three available oral cholera vaccines. WHO recommendations for their use are as follows.

- ❖ Available data indicate that the current oral cholera vaccines are safe and offer good protection for an acceptable period of time (12 and 24 months among children and adults, respectively). However, the need remains to obtain additional efficacy data on live oral cholera vaccines.
- ❖ O139 should be included in oral cholera vaccines as it is responsible for a significant proportion of cholera cases.
- ❖ The use of oral cholera vaccines in certain endemic and epidemic situations must be complementary to existing strategies for cholera control, such as safe water, sanitation and case management.
- ❖ Well-designed demonstration projects in which oral cholera vaccines are used in endemic and epidemic situations should be implemented as soon as possible to provide information for use by global programmes.
- ❖ There exists a need for efficient surveillance and reporting systems to assess the true burden of disease and help decide the optimum situation for use of oral cholera vaccines.

## New vaccines

Several demonstration projects using oral cholera vaccines were conducted in different countries under emergency and endemic situations. These projects include the first demonstration project using oral cholera vaccines in Beira, Mozambique (December 2003–December 2004), the cholera mass vaccination in Darfur, Sudan (July 2004) and the post-tsunami mass vaccination campaign in Aceh Province, Indonesia (April–July 2005). The results of these projects showed variable protective efficacy of the vaccines used.

Several challenges are facing the use of oral cholera vaccines, especially under emergency situations, including:

- ❖ risk assessment and risk perception concerning the cholera situation in the area;
- ❖ defining the target population, which influences vaccine need, cost and wastage;
- ❖ planning, preparation and implementation of mass vaccination;
- ❖ logistics, such as vaccine transport, storage capacities, cold chain, availability of water and cups, as well as waste disposal;
- ❖ cost and availability of the vaccine.

### 3.6 Briefing on country comprehensive multi-year plans

*Dr P. Lydon*

Planning for immunization at national level involves various priorities, objectives and planning processes of the different partners involved (e.g. national health sector plans, GAVI plans, EPI plans). Although these priorities and processes are not necessarily competing with each other, they do make it difficult to plan holistically for the programme.

To address this issue and in the context of GIVS, new guidelines and tools are being developed to help countries to prepare a comprehensive multi-year plan. A comprehensive multi-year plan is defined as a plan that provides national goals, objectives and strategies for 3–5 years, based on situational analysis. Its aims are to streamline planning activities for immunization; establish links with the health sector and synchronize with other planning processes; and have a flexible rather than a prescriptive approach; GIVS should only be seen as an operating framework.

The term “comprehensive” requires that the plan:

- ❖ addresses all components of the immunization system;
- ❖ focuses on the immunization system, rather than on specific initiatives (e.g. polio, maternal and neonatal tetanus, GAVI);

- ❖ integrates activities;
- ❖ includes costing and financial planning.

In terms of the costing and financing elements, the same methods and tools that were developed for the financial sustainability planning process are being used for the comprehensive multi-year plan. A finalized version of the comprehensive multi-year plan guidelines and costing tools are to be available by end 2005.

### 3.7 Group work

#### *Group 1. Hib GAVI Initiative*

Hib conjugate vaccine has been introduced in many countries in the Americas, Europe, Eastern Mediterranean Region, Australia and New Zealand. Different countries have used a variety of vaccine products and vaccination schedules. Nevertheless, routine vaccine use has consistently led to dramatic declines in Hib disease incidence in both industrialized and developing country settings. During the 1990s, Hib conjugate vaccine was introduced throughout the Americas, in many Eastern Mediterranean countries, and in some European countries. In contrast, Hib conjugate vaccine has only been introduced in a minority of countries in sub-Saharan Africa, despite consistent evidence of substantial Hib disease burden. Even fewer countries in Asia have introduced Hib vaccine.

There are a number of barriers to vaccine introduction in these regions, including limited awareness and communication about Hib disease, uncertainty about Hib disease burden, and concerns about the financial and programmatic impact of Hib vaccine introduction. The GAVI Hib Initiative will expedite and sustain the prevention of Hib meningitis and pneumonia worldwide by supporting evidence-based country decision-making regarding use of Hib vaccine. The goals of this initiative are to:

- ❖ amplify the impact of Hib disease prevention activities through country consultation and support, regional information sharing, and global coordination;
- ❖ assist GAVI-eligible countries that have introduced Hib vaccine to make evidence-based decisions about the continuation of routine Hib vaccination;
- ❖ support evidence-based decision-making about vaccine introduction in countries that have not introduced Hib vaccine.

These goals will be achieved through various strategies, including country-level consultations, and by convening

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regional forums involving policy-makers from GAVI-eligible countries, donor agencies, medical organizations, representatives of key non-GAVI eligible countries, and research groups with regional expertise. The GAVI initiative will work closely with WHO in the country consultation process and the regional forums, in addition to consulting with international GAVI partners to learn from past experience. A strategic plan will be developed with a framework based on three broad groupings of countries.

1. Countries that have already introduced Hib vaccine will be assisted to make evidence-based decisions about the continuation of routine Hib vaccination.
2. Countries in regions with significant Hib disease burden that have not yet introduced Hib conjugate vaccine will be supported to increase awareness of Hib disease, to communicate existing data about Hib disease, to gather local data about Hib disease and to evaluate the potential costs and benefits of Hib vaccine introduction.
3. Countries in regions with unclear burden of Hib disease will be supported to assemble and evaluate existing data on Hib disease burden.

This initiative will be managed by a consortium made up of the Johns Hopkins Bloomberg School of Public Health, London School of Hygiene and Tropical Medicine and CDC Atlanta, and will work closely with WHO. The organizational structure will include a team leader, a WHO representative, a communications director, a cost-effectiveness studies director and a health systems expert. An executive committee with representatives from the consortium members and a technical advisory group will guide the team leader in management of the initiative.

### *Group 2. Comprehensive multi-year plan*

The comprehensive multi-year planning tool was presented in more detail to a group of non-GAVI eligible countries. There was general support for the work being undertaken on the comprehensive multi-year plan guidelines and tools by non-GAVI eligible countries; however, it was unclear whether all or only elements of the guidelines and tools could be used to strengthen national strategic planning for immunization.

In some countries, processes to cost and budget for the needs already exist. However, there was concern about the lower capacity to advocate for financial resources needed for the programme. The majority of countries expressed a desire to have more training in immunization costing and financing and in the available tools.

Two recommendations were formulated for consideration: supporting generic training and capacity-building activities in immunization costing and financing for non-GAVI eligible countries in the Region, and supporting the use of the comprehensive multi-year plan guidelines and tool in the Region.

### *Group 3. Surveillance for new vaccines introduction*

The objectives of the third group work were to discuss the status of surveillance of pneumococcal disease and rotavirus, and discuss the need for and the components of networking.

**Bahrain** Meningitis surveillance is ongoing in secondary/tertiary health care provided by the two hospitals. These institutions are responsible for providing 99% of health care in Bahrain. The standardization of procedures clearly states that the laboratory must provide culture results for cerebrospinal fluid and blood within 24 hours. The computerized discharge diagnosis is classified by the International Statistical Classification of Diseases 10 (ICD-10), thus allowing the system to quickly retrieve retrospective data. A retrospective study has been under way since 2004. Pneumococcal vaccine was introduced 15 years ago. The pneumococcal isolates have not been serotyped in the past. Data on rotavirus have been captured (total numbers only) since 1998 among children aged under five years. A formal surveillance system is to be launched soon, for hospitalized diarrhoea cases only.

**Lebanon** Meningitis is under surveillance. All public and private health institutions are involved. Standard diagnostic tests are performed (antigen test, cerebrospinal fluid/blood culture). Cases are classified into meningococcal, Hib, pneumococcal and unspecified meningitis; however, data available are incomplete. The bacterial culture yield is low for cerebrospinal fluid and blood investigation. An alarming rate of 80% cerebrospinal fluid negative culture indicates an acute need for training. No data are available on rotavirus diarrhoea.

**Libyan Arab Jamahiriya** Meningitis is reportable but is biased towards the reporting of meningococcal disease. Meningitis is further classified into viral and unspecified. The surveillance system is in the process of being formally established in the Libyan Arab Jamahiriya. Few data are available from the two hospitals at Benghazi. A WHO mission in September 2005 will coordinate with the Ministry of Health to analyse the data. No data are available on rotavirus.

**Oman** All types of meningitis are under surveillance and have been notifiable in the national reporting system since 1991. Meningococcal and Hib meningitis are in Group A

## New vaccines

priority diseases (notification within 24 hours) while other bacterial (including pneumococcal), viral and unspecified diseases are in Group B (reporting within seven days). All meningitis cases are investigated with antigen, cerebrospinal fluid and blood culture tests. However, the lumbar puncture refusal rate is fairly high and sometimes pre-referral antibiotic administration leads to a low yield of cerebrospinal fluid/blood culture. In January 2005, pneumococcal disease surveillance was initiated in the secondary/tertiary care institutions with reporting of meningitis, septicaemia, pneumonia and otitis media. The surveillance of invasive pneumococcal disease will be further extended to the provincial level hospitals in near future. All isolates are sent to the central public health laboratory for confirmation and further investigation, such as serotyping. At present, the typing is being done at the NAMRU-3 laboratory. Surveillance of rotavirus diarrhoea among children aged under five years was introduced in January 2005 at selected sentinel sites and included referral secondary/tertiary hospitals from all health provinces. The burden of diarrhoea in the under-five age group was found to be substantial. The regional focal points (epidemiologists) therefore developed a national protocol and standard operating procedures. The protocol was discussed at clinical meetings of the tertiary hospital to get the full cooperation of the paediatricians. The data generated are being copied to the Regional Office. The stools are tested for serological evidence in the central public health laboratory and genotyping will be done at the NAMRU-3 laboratory. In the first quarter of 2005, 92 samples were tested with serology and were found positive for rotavirus infection in about 70% of cases.

**Qatar** Syndromic surveillance is in place in Qatar. The private health sector is small and licensing is strictly controlled. All cases of meningitis from the primary health care sector are referred to the only secondary/tertiary care hospital in Doha. All meningitis cases are subjected to cerebrospinal fluid examination. The lumbar puncture refusal rate is negligible. Routinely the meningitis cases are subjected to laboratory tests including antigen test and cerebrospinal fluid/blood culture. The serotyping of the pneumococcal isolates in the past (2000–2002) was done in a British laboratory. On the basis of the prevalent serotypes, recommendations for the specific type of vaccine were made. The early introduction of pneumococcal vaccine was made on the evidence of rising antibiotic resistance. The impact of the vaccination programme has led to a reduction of 80% in the incidence of pneumococcal meningitis. Rotavirus surveillance is in the process of being established in Qatar. Laboratory facilities are being upgraded and serotyping facilities are being developed in Qatar in collaboration with NAMRU-3 laboratory.

**Saudi Arabia** All clinically suspicious meningitis cases are routinely investigated. Blood culture is ordered before administration of antibiotics. Due to special concern over outbreaks following the pilgrimage, it is ensured that all suspected meningococcal meningitis are investigated. Surveillance is in place in all government hospitals. Culture of admitted pneumonia cases is done but results are not reported. A few studies have been conducted in universities on rotavirus infection, however formal surveillance has not yet been launched.

**United Arab Emirates** All types of meningitis are reportable in the country by both the government and private sector. Pneumonia, septicaemia and otitis media are not reported and rotavirus surveillance has not yet been initiated. The private sector provides over 60% of services, however surveillance by this sector is relatively weak. At present, there is no national reference laboratory and further constraints include the increased privatization of the health sector and the weaknesses in the surveillance system.

### Discussion

Participants discussed the need for support networking. Meningitis was considered a priority disease for surveillance by all the countries; however, the data between the countries were not comparable. Surveillance partners include the laboratory, clinicians and surveillance managers. Of these, laboratory support was considered the cornerstone for surveillance. All countries requested some assistance in the strain characterization of the pneumococcal isolates; hence, a support network led by the Regional Office was welcomed by all.

The following recommendations were formulated:

- ❖ standardization of procedures and reporting protocols;
- ❖ technical support, including laboratory standardization;
- ❖ training of technical personnel in surveillance/laboratory/data management;
- ❖ surveillance partners to be strongly united in a common cause.

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### 4. Poliomyelitis eradication

#### 4.1 Regional overview: progress and plans

*Dr Faten Kamel*

Strong political commitment and intensification of polio campaigns in the remaining endemic countries of the Region has resulted in much progress being made. Cases were halved in 2004 as compared with 2003. Progress continued in 2005, with only 10 cases in Pakistan and three in Afghanistan up to July. Alongside these encouraging developments, the Region suffered a serious setback with the reintroduction of poliovirus from Nigeria to Sudan and from there to Saudi Arabia and Yemen. Only two cases were reported from Saudi Arabia late in 2004 due to imported poliovirus, with no secondary spread. In Sudan and Yemen, however, the importations have resulted in explosive epidemics.

The number of poliomyelitis cases in the Region has decreased from an estimated 35 000 cases a year in 1988 to only 113 cases during all of 2003. In 2004, a total of 187 cases were reported, the majority of them in Sudan (127) resulting from an importation. To date, the number of cases in 2005 is 340 cases (Figure 7), mostly from Yemen (302 cases). The number of cases reported from endemic countries dropped greatly during 2004–2005, from 113 in 2003 to 58 in 2004 and to 13 so far in 2005. Egypt has not reported any cases during 2005 and it is more than a year since the last confirmed case (May 2004). In addition, genomic sequencing results show diminished genetic diversity of the viruses isolated from Afghanistan and Pakistan, reflecting progress towards eradication in these countries.

Intensification of supplementary immunization activities continued in 2004–2005 in the remaining endemic countries,

each of which conducted eight rounds in 2004. Supplementary immunization activities were mostly in the form of national immunization days and, in a few cases, sub-national immunization days. In addition, mop-up activities were added to interrupt transmission in areas where the transmission is becoming focal. Several countries conducted supplementary immunization activities to guard against spread of the virus in the event of an importation (Bahrain, Djibouti, Jordan, Libyan Arab Jamahiriya and Oman).

Surveillance for acute flaccid paralysis is one of the main strategies and the driving tool for polio eradication activities. It is currently well established in all countries of the Region, even in those affected by war and in areas with rudimentary health infrastructure. The polio eradication surveillance structure has been used for the surveillance of other diseases targeted by EPI, and in some countries it is also used for investigation and response to other communicable diseases and emergencies.

The required level of sensitivity of acute flaccid paralysis surveillance (non-polio acute flaccid paralysis rate of 1 per 100 000 population aged under 15 years) was exceeded during 2004 at the regional level (2.68) and in all countries except Bahrain, Djibouti and United Arab Emirates, which have only a small number of expected cases, and Palestine, which has a difficult security situation. For 2005, the annualized regional non-polio acute flaccid paralysis rate is 3.17 (Figure 8). The second quality indicator for surveillance, namely percentage of acute flaccid paralysis cases with adequate stool collection, was maintained in 2004 above the global target of 80% both at the regional level (90%) and in individual countries except Djibouti, Jordan and Lebanon. For 2005, the stool adequacy rate is 89% (Figure 9)

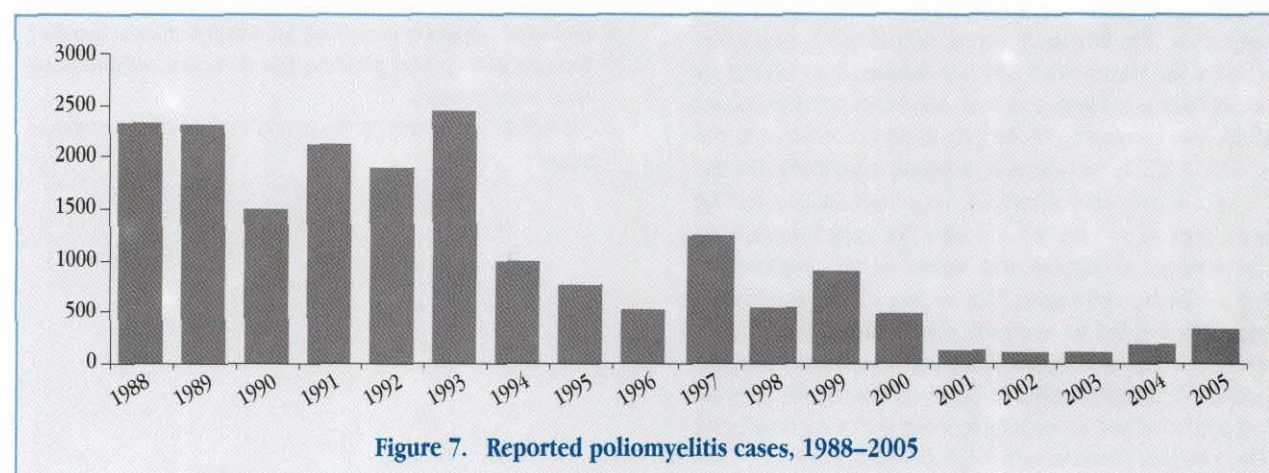
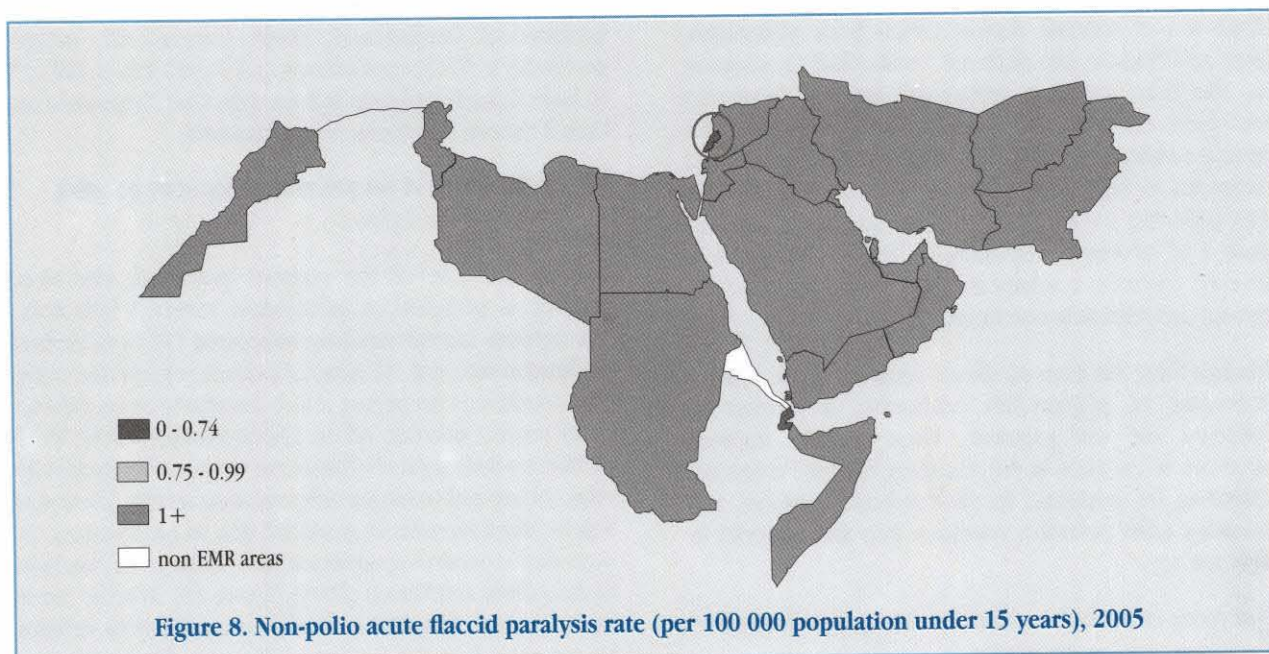


Figure 7. Reported poliomyelitis cases, 1988–2005

# Poliomyelitis eradication

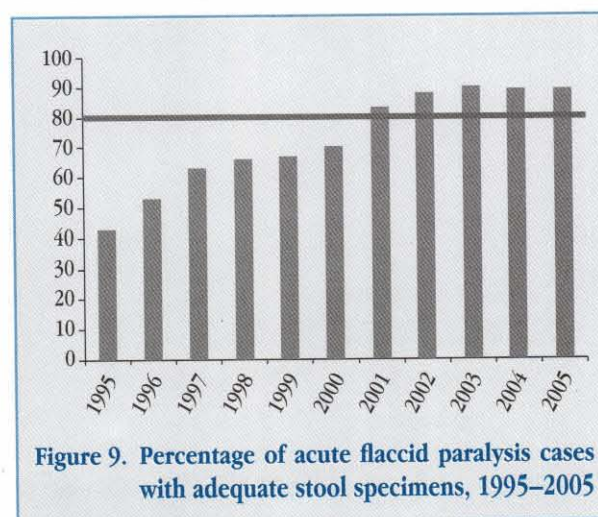


The poliomyelitis surveillance system is supported by a network of 12 poliomyelitis virus network laboratories which function to a very high standard and are accredited by WHO (except the laboratory in Iraq, which could not be visited due to the security situation). To ensure that certification-standard surveillance is maintained, surveillance reviews are conducted periodically. These international reviews highlight issues that need immediate corrective action to maintain the sensitivity and quality required for surveillance systems capable of timely detection of any circulating poliovirus, including importations. The surveillance reviews have in general confirmed the sensitivity and reliability of the system.

Technical advisory groups were established for countries that are still endemic to review the epidemiological situation and provide advice to the national eradication programmes. A regional technical advisory group has been established to guide the eradication activities during the final phase, particularly with regard to the issues of laboratory containment of wild poliomyelitis viruses, the certification of poliomyelitis eradication, preparedness for wild poliomyelitis virus importation and development of post-eradication immunization policies.

A regional plan for a containment laboratory was developed and endorsed by the Regional Committee in 2000. At present, 18 countries of the Region have developed national containment plans, and nine of them have completed implementation of phase I (survey and inventory phase) of containment requirements.

The Regional Certification Commission continues to review documentation from countries of the Region that have been polio-free for three or more years. So far, national documentation from 17 countries has been accepted by the Regional Certification Commission. The national certification committees of these countries continue to submit annual updates to the RCC. As transmission has been re-established following the importation of wild poliovirus into Sudan and Yemen, these two countries are required to resubmit their national documentation after being polio-free for at least a year. The Regional Certification Commission has reviewed national documentation from Palestine and Somalia, with acceptance pending. In order to facilitate the eventual timely



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submission of national documentation from Afghanistan, Egypt and Pakistan, the Regional Certification Commission has also been reviewing preliminary national documents from these countries. As a step towards preparation for regional certification, the RCC decided to solicit final national documents for regional certification from countries that had been polio-free for five years or more and had completed phase I of laboratory containment. These countries will, however, continue to submit abridged annual updates until regional certification has occurred.

Although there has been significant progress in the regional programme of poliomyelitis eradication, a number of challenges are still apparent. These include stopping circulation of the virus in the remaining endemic countries, controlling the outbreaks in the reinfected countries and protecting other polio-free countries. Regional priorities in the future are:

- ❖ stopping circulation in endemic and reinfected countries
- ❖ preparedness for importation
- ❖ sustaining high quality surveillance
- ❖ ensuring high population immunity (through routine and supplementary immunization activities)
- ❖ implementing containment activities
- ❖ preparing for certification.

During 2004–2005, funds were received by WHO to support operational expenses, surveillance and staff. The main contributors to these funds were the UK Department for

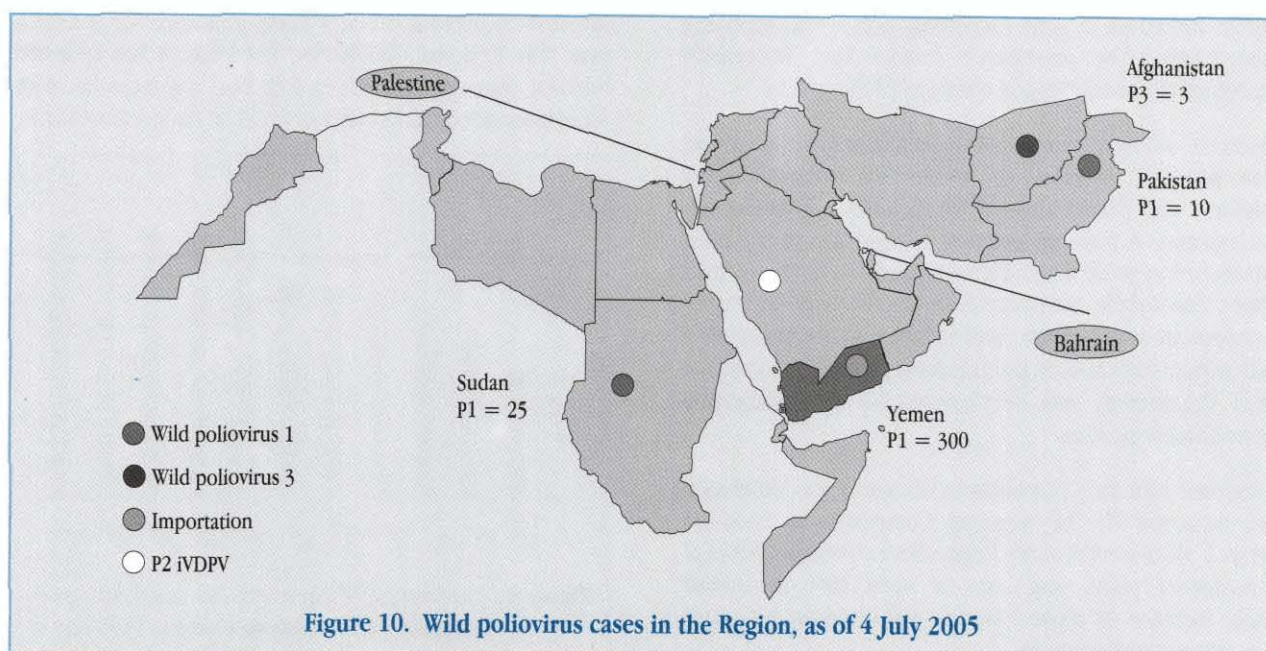
International Development, Rotary International, various governments, European Community, United Nations, Bill and Melinda Gates Foundation and the Arab Gulf Programme for United Nations Development Organizations.

### 4.2 Performance of the poliovirus laboratory network

*Dr Humayun Asghar*

The performance of the regional poliovirus laboratory network is sustained at certification standard indicators. The network laboratories have supported EPI in poliovirus eradication activities. All national poliovirus laboratories are fully accredited except Iraq, which could not be visited due to the security situation. All the laboratories passed the WHO proficiency-testing panel of unknown viruses for both primary virus culture and intratypic differentiation testing. There was a generalized increase in workload due to improvement in acute flaccid paralysis surveillance and two major outbreaks in Sudan (2004) and Yemen (2005) (Figure 10). Another factor in the increase in workload was collection of stool samples from contact cases and hot cases in Egypt and Pakistan.

All laboratory performance indicators are well above the set targets, except transportation of samples within three days, which was 66%. As of June 2005, the timeliness of results from onset paralysis to final intratypic differentiation testing is 33 days, an improvement from 40 days in 2004. Timeliness of intratypic differentiation results within 14 days after serotyping has improved from 88% in 2004 to 100% in 2005. The timeliness of stool samples after receipt in laboratories to



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final intratypic differentiation results has improved from 28 days in 2004 to 21 days in 2005. This high quality and rapid diagnosis was beneficial in dealing with critical situations during Sudan and Yemen outbreaks, and importation to Saudi Arabia.

In Egypt, acute flaccid paralysis surveillance is supplemented with environmental surveillance to increase sensitivity for detection of wild poliomyelitis virus. The percentage of environmental sites positive for polioviruses was 1.3% as of June 2005, a decrease from 57% in 2001, 16% in 2002, 4% in 2003 and 2.7% in 2004. The last wild poliovirus type 1 was isolated from Fayoum and Sohag in January 2005. The frequency and number of sewage sample collection sites were 41 samples per month from 33 sites, respectively. The decline in sensitivity of isolation of polioviruses and non-poliovirus enterovirus from sewage samples from September 2003 until early 2004 was resolved when it was found that chloroform used in the processing of sewage samples was not stabilized with alcohol, which resulted in loss of virus.

The regional reference laboratory in Pakistan established a sequencing laboratory, with the support of WHO and Rotary International, and has started the sequencing of polioviruses. This is a major achievement and sets an example for self-reliance and the transfer of technology. The national polio laboratory in Oman has been upgraded to perform intratypic differentiation testing of polioviruses and has successfully established all techniques and is now performing independently.

Despite the achievements highlighted above, the polio laboratory network is faced with the challenges of sustaining the laboratories performance, maintaining the quality assurance programme, specific budget allocations for polio laboratories and the provision of logistics.

## 4.3 Global overview

*Dr Roland Sutter*

Although polio was brought under control in industrialized countries shortly after the introduction of effective vaccines, the situation in the developing world was more challenging and few children profited from these vaccines. To rectify this and protect all children against polio, the World Health Assembly resolved in 1988 to eradicate poliomyelitis globally by 2000. Effective strategies were designed such as sensitive surveillance, routine and mass immunization approaches, and were aggressively implemented by polio-endemic countries. The impact on transmission was dramatic. Between 1988 and 2003, the incidence of poliomyelitis decreased from

350 000 estimated cases to 784 reported cases. During this period, the number of polio-endemic countries decreased from more than 125 to six. However, between mid-2003 and mid-2004, one Nigerian state discontinued polio vaccination. The ensuing epidemic transmission led to importation of wild poliovirus into 16 countries in West, Central and East Africa, the Arabian Peninsula (Saudi Arabia, Yemen), and East Asia (Indonesia). Of these, six countries have re-established transmission (circulation for more than 6 months) (Figure 11). In response, massive synchronized national immunization days were reinstituted across West and Central Africa.

At the beginning of 2005, WHO was faced with two epidemiological challenges: Africa, where the objective is to rapidly gain re-control; and Asia, where the objective is to rapidly eliminate the final foci of transmission. To further accelerate eradication, WHO, manufacturers and regulatory authorities collaborated to make monovalent type 1 oral poliovaccine (mOPV1) available as a supplementary tool to eliminate type 1 polioviruses in 2005. Much progress has been made towards global polio eradication, but clearly much more is required before the "finish line" with eradication can finally be crossed.

## 4.4 Pakistan: improving quality of supplementary immunization activities using the high-risk approach

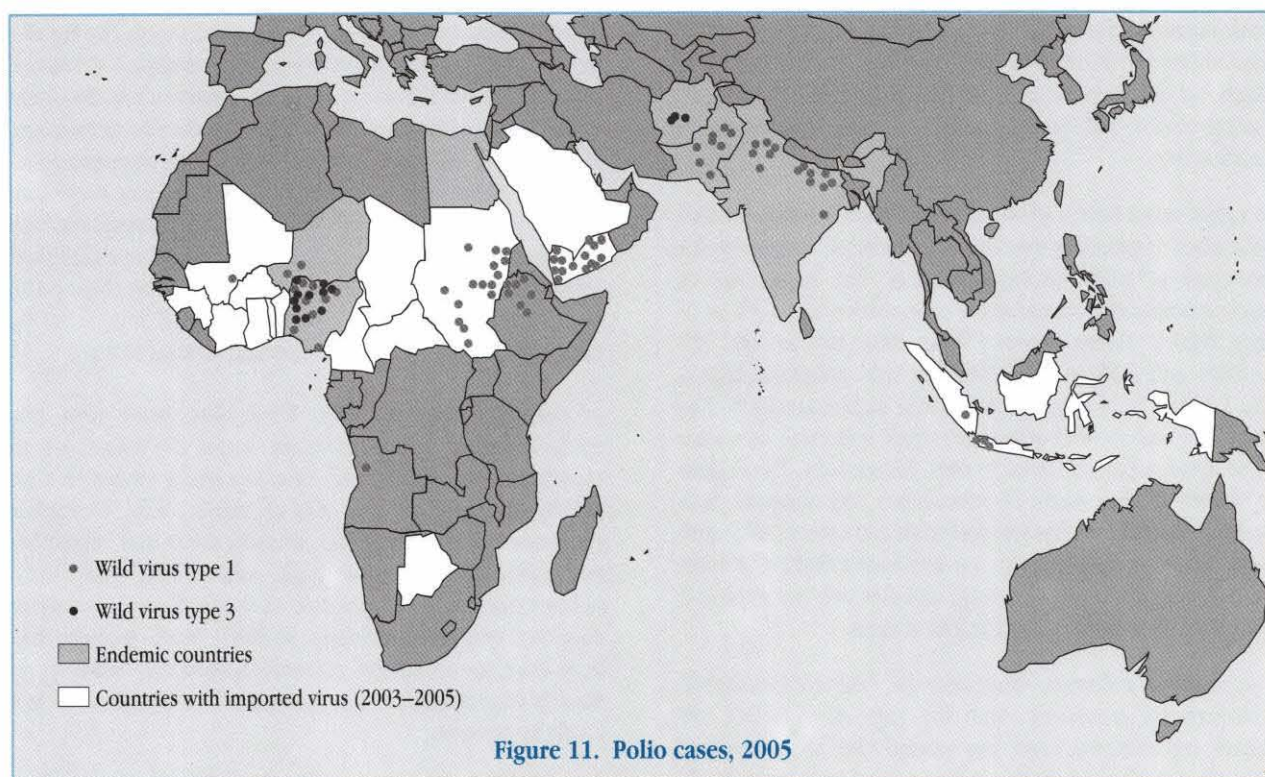
*Dr M. Azam*

Pakistan first launched EPI in 1994 through two national immunization days. The key strategy was for vaccination through fixed sites. Up to 1997, there was a marked reduction in the incidence of wild poliovirus cases but progress, however, stalled. It was observed that more than 15% of children of target age, especially young infants, remained unreached. A house-to-house vaccination strategy was adopted beginning in 2000. In 2002, a high-risk district approach was used, with additional rounds (sub-national immunization days or targeted campaigns) being held in such districts.

Various data sources used to identify high-risk districts include acute flaccid paralysis data and campaign monitoring data. Management factors, accessibility factors, demographic factors (such as ethnicity or religion) and subjective feedback and reports from international observers are also considered. Accessibility factors include the security situation, sociocultural barriers, communications and health infrastructure of a community.

Campaign monitoring data are analysed by scoring several indicators that are derived from the data collection forms. These fall into two categories: process indicators and outcome

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indicators. Process indicators include the proportion of teams visited by a supervisor, the proportion of teams recording the names of children not present when the team visited, the proportion of vaccination teams with a female member, and the proportion of teams that received training. Outcome indicators are primarily derived from data collected in the post-campaign period. Indicators include percentage of children found vaccinated, percentage of areas visited that were missed by teams, and percentage of areas poorly covered by teams. The process indicators have been shown to be statistically correlated with immunization coverage. Outcome indicators are correlated with circulation of virus. Taken together, they serve as useful predictors of where virus is likely to arise or persist. The information is used to target areas for special regional immunization campaigns and for additional technical support.

The following strategies were developed for high-risk districts through a consultative process. They have resulted in a reduction in chains of wild poliovirus transmission and reduction in reservoir areas.

- ❖ Advocacy for highlighting high-risk districts: national-level meetings involving national, provincial and district leadership in both civil and health.

- ❖ Strengthened supervision: additional monitors were placed in high-risk areas for each tehsil (sub-district unit) and area-in-charge to team ratio decreased (1 per 5 teams).
- ❖ Increased number of travel-point sites: to improve their functioning and ensure vaccination of children on the move.
- ❖ Increased number of communication support persons: for developing district-specific advocacy and social mobilization plans.

### 4.5 Afghanistan: using data monitoring to guide strategies

*Dr Tahir Mir*

The programme in Afghanistan uses field observations in combination with the following methods when deciding strategic direction: poliovirus epidemiology, post-campaign monitoring, acute flaccid paralysis surveillance and genetic sequencing data. Median OPV doses have improved from 8 to 11 over the last three years, however children aged under 2 years continue to be victims of poliovirus. Poliovirus transmission has become localized to the southern region of Afghanistan.

# Poliomyelitis eradication

Data monitoring suggests that the programme needs more in-depth and basic unit-based analysis. National or regional averages are satisfactory but could be misleading. Provincial- and district-based analysis has highlighted the gaps both in supplementary immunization activities and surveillance. The northern region shows a relatively high number of children with zero doses or fewer doses than expected.

Response strategies, in line with monitoring data analysis, have improved campaign quality and acute flaccid paralysis surveillance. These include enhanced coordination at provincial level among all partners, advocacy at provincial level, involvement of provincial and district governors, and greater involvement of female community health workers from nongovernmental organizations.

Post-campaign monitoring data/median OPV doses of acute flaccid paralysis cases highlighted inconsistent campaign quality and resulted in a more focused approach, including improved planning and training, and closer supervision in these areas. Additional human resource support has been given. For future rounds in 2005, at least 50% of all clusters (100% of clusters in high-risk areas) are to be included in the post-campaign monitoring. To ensure definite action on the findings of the post-campaign monitoring, accountability will be held at all levels.

## 4.6 Use of monovalent vaccine: rationale and experience

*Dr Roland Sutter*

Since the World Health Assembly resolved in 1988 to eradicate polio globally, impressive progress towards a polio-free world has been made. Wild poliovirus type 2 was last detected in 1999, and wild type 3 circulation is increasingly focal. Only six countries have never interrupted indigenous poliovirus transmission, despite frequent and increasingly high-quality campaigns. To facilitate eradication, the technical oversight committee for polio eradication recommended, in September 2004, developing monovalent oral poliovaccine (mOPV1). mOPV1 is substantially more immunogenic per dose (~81% seroconversion) than is trivalent OPV (tOPV) (30%–40% seroconversion) against poliovirus type 1. Campaign use of mOPV1 will ensure high population immunity against type 1 poliovirus after 2–3 doses. However, mOPV1 will not induce immunity to types 2 and 3. Therefore, mOPV1 use should be considered supplemental to the continued tOPV use in routine efforts and campaigns.

The development, regulatory and procurement work involving industry, the French regulatory authority, the Egyptian regulatory authority, the Bill and Melinda Gates Foundation, UNICEF and WHO led to mOPV1 licensure in

March 2005 in France and April 2005 in Egypt. In parallel, large-scale campaigns with mOPV1 were conducted in India in April and May (130 million doses), Egypt in May (14 million doses), and Yemen in May (6 million doses). Post-marketing surveillance will provide safety data, and an assessment of impact is pending. Rapid development and large-scale production of mOPV1 has provided a “sharper tool” to interrupt wild poliovirus 1 transmission in the last remaining endemic reservoir countries.

## 4.7 Report on polio communication meeting

*Dr Essam Allam*

The meeting of the technical advisory group on communication for polio eradication was held in Yaoundé, Cameroon from 22 to 24 June 2005. The meeting was attended by participants from 16 countries (Afghanistan, Benin, Burkina Faso, Central African Republic, Cameroon, Chad, Cote d'Ivoire, Egypt, Guinea, India, Mali, Niger, Nigeria, Pakistan and Sudan). Also present were representatives from key technical and donor partners: WHO, UNICEF, United States Agency for International Development (USAID), CDC Atlanta and Rotary International.

The goal of the meeting was to improve the effectiveness of country level communication strategies and activities for polio eradication. The key objectives were to:

- ❖ present and review communication strategies from participating countries for activities proposed during the last 6 months of 2005;
- ❖ develop, via the peer review process, a series of recommendations designed to enhance those proposed strategies;
- ❖ review progress on recommendations since the June 2004 Delhi meeting.

Countries presented their situations including epidemiology, progress, communication data, communication objectives and strategies, key results, challenges and next steps. The following issues were highlighted and discussed.

- ❖ Working towards a better identification and analysis of missed children: who they are, where they are, why they are missed, and then use this information to develop more detailed strategies for solving these issues.
- ❖ The importance of having measurable progress benchmarks.
- ❖ Ensuring that the civil society networks are involved in the decision-making process.
- ❖ Communicators on polio issues require both health EPI data and also relevant social trend and status data, e.g. literacy

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levels, relevant cultural practices, local health worker perspectives and attitudes, and household decision-making processes.

- ❖ The test for any polio communication initiative is the extent to which it contributes to increased polio coverage, sustained demand for polio vaccination, and sustained political and community support and prioritization.
- ❖ Developing much smarter objectives that are measurable, clearly linked to the epidemic and social factors analysis, and directly related to the key groups and communities.
- ❖ Influencing family behaviour to seek vaccination for children and enforcing a social norm that expects all children in a community to be vaccinated.
- ❖ Developing communication activities before, during and after supplementary immunization activities so that communications activities are proactive rather than purely responsive.
- ❖ Considering who owns and runs the polio programmes at national and local levels. They need to be increasingly embedded in national and local organizations that prioritize polio.

### 4.8 Summary of surveillance reviews and issues

*Dr Abdalla Elkasabany*

Acute flaccid paralysis surveillance may satisfy the required levels of indicators but gaps are still apparent. In order to be certain about the quality of surveillance it is necessary to perform surveillance reviews, with the objective of checking that the acute flaccid paralysis surveillance system is sensitive enough to detect poliovirus circulation. The surveillance reviews conducted in the Region in 2004–2005 have in general confirmed the sensitivity of the system and its ability to detect poliovirus circulation, and indicated that the main challenge is inaccessible areas in some countries. The reviews also found issues that may lead to missing of acute flaccid paralysis cases or improper processing of them. In addition, it was observed that the acute flaccid paralysis surveillance system varies from country to country within the Region. Discussion of the reviews highlighted the following technical issues.

- ❖ The importance of maintaining the sensitivity of acute flaccid paralysis surveillance and actions necessary to counteract the risk of falsely inflating the rate.
- ❖ Clarification of the differences between zero-reporting versus active surveillance, and the nature of informative zero-reporting.
- ❖ Actions proposed in response to hot cases included flagging, detailed investigation and possible contact samples.

- ❖ The issue of contact stool samples, including rationale, indications and regional experience.

### 4.9 Follow-up on review recommendations

#### *Syrian Arab Republic*

The last case of poliomyelitis in the Syrian Arab Republic caused by indigenous poliovirus was in 1995. The Syrian Arab Republic has been considered polio-free since then. In 1999, one imported polio case was detected in Aleppo province. The main challenges are to maintain polio-free status and prevent the importation of wild poliovirus from infected countries.

The national preparedness plan for wild poliovirus importation was developed in 2000. A team of international experts visited the Syrian Arab Republic in 2004 to ensure the validity of acute flaccid paralysis surveillance. During the review, all 14 provinces were covered. The teams interviewed the surveillance staff in each province, followed by field visits to some districts and main reporting sites. The evaluation of the expert team was that the acute flaccid paralysis surveillance system in the Syrian Arab Republic is able to detect most cases. The mission made recommendations to the government to improve the system, almost all of which are in the process of implementation or are fully implemented. There still remains some finalization and approval at national level. Changes will be fully implemented into the system in the second half of 2005 and will be ready for follow-up by regional level visit by the end of 2005.

#### *Tunisia*

A WHO team comprising six consultants visited Tunisia from 15 to 20 August 2004. The objective was to assess acute flaccid paralysis surveillance system structure and functioning. The mission included meetings with the Ministry of Public Health and the Pasteur Institute in addition to visits to regional, private and university hospitals in eight governorates.

The team observed that EPI had made excellent progress during the past eight years. The rate of non-polio acute flaccid paralysis remained more than 1 per 100 000 children aged under 15 years during 2004, for the tenth consecutive year. The proportion of acute flaccid paralysis cases notified with adequate stool was more than 80% during 2004, for the eighth consecutive year. There was a high level of awareness and cooperation between the clinical and surveillance sides of the programme. All senior university hospital paediatricians were supportive, well informed and involved in the programme. The system was clearly structured at national and regional levels. Several insufficiencies were also identified, however, and

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actions were recommended in order to reinforce acute flaccid paralysis surveillance. As a result, forms of investigations were updated, some surveillance sites were added, and the EPI central team was reinforced by the addition of a physician. Further activities are planned for the future.

## 4.10 Implementation of surveillance under conflict

### *Afghanistan*

The acute flaccid paralysis surveillance reporting system includes approximately 4000 reporting sites, 453 focal points and 65 provincial polio officers, in addition to regional teams and national teams from the Ministry of Health and Population, WHO and UNICEF. Major challenges to the programme are the difficulty of access (due to geographical, security, weather and communication limitations) and restrictions on the movement of surveillance staff as a result of personal danger. Other challenges include early case detection, timely stool collection, stool shipment, maintaining the reverse cold chain and timely quality active surveillance.

The conflict area approach has been developed and customized to meet district/locality needs. The approach is focused on community-based surveillance (through pharmacies, shrines, faith healers, etc.) and close coordination with partners (Ministry of Public Health, UNICEF, WHO, nongovernmental organizations). Other steps include:

- ❖ introduction of a temperature flow sheet validating reverse cold chain;
- ❖ placement of district-based staff;
- ❖ transferring greater responsibility to nongovernmental organizations;
- ❖ district-based initiatives;
- ❖ contact sampling from acute flaccid paralysis cases being sent without any delay from focal point to regional level.

Recent data analysis clearly indicates that the conflict area approach is working well. Acute flaccid paralysis surveillance indicators are meeting globally set standards, although in security compromised areas further improvement is needed. Reverse cold chain status of stool specimens from distant areas is satisfactory but needs periodic review. Using district-based surveillance staff has had encouraging results and the key role of partners has been acknowledged.

### *Palestine*

The obstacles and limitations facing the acute flaccid paralysis surveillance system in Palestine are numerous. They include roadblocks and limitation of movement, the curfew, the

dividing wall, the fact that the referral laboratory is located in Israel (with permits to reach to laboratory not easily obtainable), and the lack of connection between the West Bank and Gaza. In this situation, priorities are necessarily focused on the emergency and there is a lack of awareness concerning public health and primary health care.

Interventions and considerations in order to deal with the situation include:

- ❖ medical and paramedical awareness for Ministry of Health staff;
- ❖ mobilization of UN agencies;
- ❖ staff transportation;
- ❖ vaccine transportation;
- ❖ medical samples transportation, including stool samples;
- ❖ sustaining high vaccination coverage;
- ❖ reaching remote areas through intervention by the UN, international donors and nongovernmental organizations;
- ❖ conducting mopping-up and catch-up campaigns;
- ❖ serosurvey and environmental screening;
- ❖ encouraging involvement of private paediatricians by offering a certificate issued by the Ministry of Health and signed by the Minister;
- ❖ recirculating instructions to all hospital and concerned health facilities.

## 4.11 Introduction: outbreak anticipation and supplementary immunization activity plans

*Dr M.H. Wabdan*

### *Overview*

Anticipation of outbreaks of poliomyelitis can be done by regular analysis of acute flaccid paralysis surveillance data and assessment of the immunity status of children. The regular analysis of acute flaccid paralysis surveillance data should study the time, place and personal characteristics of cases and should be done frequently. In addition to regular desk analysis, field reviews should be carried out to provide an in-depth evaluation of the situation. The assessment of the immunity status can be done by serologic survey, analysis of immunization data, analysing the number of doses (valid doses), evaluating the quality of vaccine and vaccination process and looking into the changes in immunity profile over time. The expected outcome of this analysis is the early detection of immunity gaps in the population. This can be done by looking at the immunity profile of non-polio acute flaccid paralysis cases. This has to be considered in the light of routine immunization schedules and supplementary immunization activities.

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Analyses of the immunity profile of children aged 6–23 months in some countries of the Region were considered (Afghanistan, Egypt, Islamic Republic of Iran, Iraq, Morocco, Pakistan, Saudi Arabia, Somalia, Sudan and south Sudan, Syrian Arab Republic and Yemen). From the analysis it was concluded that:

- ❖ endemic countries (Afghanistan, Egypt, Pakistan) have good immunity profiles;
- ❖ some countries that are polio-free are not maintaining good population immunity;
- ❖ the rapid deterioration of immunity profile allows for epidemics once the virus is introduced (Sudan, Yemen);
- ❖ there is a need to keep the immunity status under regular review and to make preventative interventions.

### *Saudi Arabia importation*

Saudi Arabia is a large country, a major pilgrimage centre and a focus of expatriate labour comprising several million workers from different countries. All these factors put Saudi Arabia at high risk of importation.

Two cases were imported in Saudi Arabia in late 2004. They were regarded as emergencies and all necessary resources were made available to carry out preventive measures, such as:

- ❖ extension of containment vaccination to all districts around the areas of the index cases;
- ❖ revision of basic vaccination status of children aged under 1 year;
- ❖ revision of sub-national immunization day coverage since 2001 at health centre level;
- ❖ revision of zero-reporting from hospitals and active surveillance visits during the last 4 years.
- ❖ conduction of active surveillance visits to all hospitals in related provinces on weekly basis to detect unreported acute flaccid paralysis cases and alert doctors to the situation;
- ❖ vaccination of children aged under 5 years in the neighbouring districts with two doses of OPV;
- ❖ all hospitals in related province were visited, active search for acute flaccid paralysis cases was conducted in the departments of paediatrics, medicine, emergency, infection control, neurology and orthopaedic surgery but no additional cases were identified;
- ❖ vaccination coverage and sub-national immunization day coverage at the health centre level were reviewed and all health centres were visited and asked to maintain high coverage (over 90%).

- ❖ all activities were followed up daily by the central authorities;
- ❖ the results of stool samples were confirmed in the WHO regional reference laboratory in Cairo and the virus isolated was found to be closely related to the strain circulating in Sudan;
- ❖ the case was followed for 60 days, reviewed by the expert committee and diagnosed as a case of imported poliomyelitis.

Future plans to guard against importations include: subnational immunization days in Hajj areas and at southwest border; national immunization days in 2005, continuing every year for next 3 years; and subnational immunization days in February and March 2006.

### *Sudan epidemic*

Sudan is the largest country in Africa, sharing borders with nine countries, suffering a longstanding internal conflict, and having suboptimal routine immunization coverage, yet wild poliovirus was had last been detected in April 2001. However, in June 2004, tests confirmed a case of poliomyelitis, marking the first occurrence of this disease in Sudan after three years of wild poliovirus-free status. The virus in this case has been linked genetically to wild poliovirus type 1 detected in Chad. It was originally imported to Chad from North East Nigeria in May 2003. Subsequently, poliovirus cases continued to be reported from various places in the country and by the April 2005, a total of 152 polio cases were reported from 18 states (12 of the cases were from areas in the south). All cases were due to wild poliovirus type 1 except for three cases of type 3. The speedy spread and scale of this epidemic were due to the following factors:

- ❖ importation occurred at the beginning of the high transmission season;
- ❖ large population movements as a result of the ongoing insecurity in Darfur;
- ❖ low population immunity due to the cessation of national immunization days after 2002;
- ❖ suboptimal routine immunization coverage due to insecurity and problems related to funding, management, skilled manpower and logistics;
- ❖ population movement from West African countries through Sudan during pilgrimage is historically associated with communicable diseases outbreaks, such as smallpox and relapsing fever;
- ❖ situation in internally displaced persons' camps, which is characterized by overcrowding and poor hygienic standards.

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More than 80% of cases were among children aged under 3 years and the vaccination status of cases was poor (over 50% were unimmunized or partially immunized). The response activities included further strengthening of acute flaccid paralysis surveillance systems in all states and supplementary immunization campaigns. Specific activities undertaken in the field of acute flaccid paralysis surveillance were as follows:

- ❖ information was disseminated to polio staff and partners;
- ❖ detailed investigation of the first polio case and subsequent cases;
- ❖ immunization surveys around the cases;
- ❖ search for additional cases in the communities;
- ❖ retrospective search in the medical records for missed acute flaccid paralysis cases;
- ❖ re-examination of acute flaccid paralysis cases with residual paralysis since 2001;
- ❖ acute flaccid paralysis case-search during the mop-up immunization was part of the mop-up activity;
- ❖ national polio laboratory performance was reviewed by the Regional Office, which found no evidence of laboratory contamination.

The supplementary immunization activities included two mop-up immunization campaigns and five national immunization day rounds covering all the states. Over 5 million children were vaccinated against polio in each round. Use of independent monitors was valuable and the sample size of monitoring increased from 25 000 children to 65 000 children. The results of independent monitoring showed high coverage at the national level.

In response to the spread of poliovirus, Sudan organized a cross-coordination meeting with its neighbours in Khartoum, from 7 to 8 February 2005. Countries shared their experiences in polio eradication and identified the areas of collaboration. These areas included synchronization of supplementary immunization activities, sharing information of acute flaccid paralysis surveillance, formulating plans of actions to improve the cross-border activities and conducting cross-border meetings at local levels. Another internal coordination meeting was conducted in Nairobi from 17 to 18 March 2005 between the north and south polio eradication teams.

The lessons learned from this outbreak were that although the poliovirus importation and the response was a new experience for the Sudan polio eradication programme, the national programme showed a high level of alertness and competency to respond effectively. Sudan's experience is a reminder for the global eradication programme of how imported polioviruses can easily attack any population with

favourable conditions, in terms of accumulation of susceptible children living in a poor hygienic environment. Polioviruses have no respect for borders; Sudan suffered from importation and is currently exporting to other neighbouring countries.

### *South Sudan*

There are unique features to the structure and system of the polio eradication programme in south Sudan due to the ongoing civil war and serious challenges such as the lack of infrastructure, high insecurity and inaccessibility in many areas. The programme has five regional hubs in south Sudan, in addition to two other hub offices in Lokichokio and Nairobi, Kenya.

Despite the challenges, the surveillance system has achieved certification standard performance in 2000 at both national and regional levels. Annualized non-polio acute flaccid paralysis in 2005 is expected to increase in the second half of the year, as observed in previous years. Some concern is voiced regarding the low rate of isolation of non-polio enterovirus among acute flaccid paralysis cases and is probably attributed to problems with the Kenyan Medical Research Institute laboratory, which has recently lost accreditation.

From the epidemic curve in all Sudan during 2004–2005, it is observed that there is a secondary peak in the number of cases towards the end of 2004 and beginning of 2005. This is mainly attributed to the introduction of wild poliovirus type 1 cases into South Sudan. After being polio-free for more than 3 years, national immunization days in South Sudan were stopped in 2004 leading to an increase in the immunity gap among young children. However, after the initial importation of the wild poliovirus type 1 in Darfur in the north, several sub-national immunization days and mop-ups were conducted in 2005. At the same time as wild poliovirus type 1 importation, type 3 was also detected in Sudan. A series of supplementary immunization activities were implemented: three mop-ups, two sub-national immunization days in 2004 and one sub-national immunization days and four national immunization days in 2005. By mid-July 2005, there was a total of 12 wild poliovirus cases from South Sudan: two wild poliovirus type 3 and six type 1 in 2004 and four type 1 in 2005.

The profile of polio cases shows that the majority of cases in 2004–2005 were females under 5 years old who were more likely to have had less than three OPV doses when compared to other acute flaccid paralysis cases. The immunity gap created due to the stopping of national immunization days in 2004 was well addressed, with several supplementary immunization activities implemented in response to the outbreak. Reported coverage shows that the 2004–2005

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supplementary immunization activities reached more children than ever before in south Sudan, thus bridging the immunity gap and increasing the vaccination coverage. Additionally, the decrease in the percent of zero-dose children during supplementary immunization activities is also indicative of the improved quality. Several factors enabled this to be achieved, such as the increase in access, the enhanced review of microplanning and the strengthening of supervision and monitoring components. Additionally, the Regional Office has supported the programme with an increase in field staff to ensure appropriate implementation of field activities. Post-campaign evaluation in the highest risk areas of Upper Nile has shown coverage of 90% and 10% zero-dose. The majority (17%) of zero-dose children identified in the post-campaign evaluation were returnees.

Challenges due to insecurity, inaccessibility and movement of returnees continue to exist. The low education level of staff and vaccinators, in addition to weaknesses in supervision and monitoring, will require further improvement. Overall, wild poliovirus circulation seems to have been interrupted in south Sudan. In 2005, the programme plans to conduct several activities in the areas of surveillance and supplementary immunization activities. In surveillance, contact sampling will be initiated along with refresher acute flaccid paralysis surveillance training and an international surveillance review is scheduled for September 2005. Regarding supplementary immunization activities, there will be two sub-national immunization days in October and November with plans to expand the independent post-campaign evaluation. Mop-ups will be implemented if required.

### *Yemen outbreak*

Yemen had no reported cases of polio between 1998 and 2005. The last national immunization days were conducted in 2001 and sub-national immunization days were conducted in 2002 and 2003. Routine coverage has been relatively low for the past five years, with an increase in 2004. A technical committee met in December 2004 to implement measures to prevent importation. The committee was composed of the Minister of Public Health and Population, Deputy Minister of Health, WHO Representative, EPI manager, surveillance unit director and WHO consultants. The actions that were decided upon included:

- ❖ vaccination of all children aged under 5 years arriving in Yemen at all entry points;
- ❖ intensification of acute flaccid paralysis surveillance;
- ❖ conduction of national immunization days in February and March 2005.

In Hodeida, there was increase in acute flaccid paralysis cases in March 2005 compared with 2004. Initially, clinicians and investigators from the Ministry of Public Health and Population attributed the cases to traumatic neuritis. However, due to a continuous increase in acute flaccid paralysis cases, a technical team with representatives from the Ministry and WHO visited Hodeida to investigate the situation. Laboratory results have since confirmed the first four cases of poliovirus, from four different districts in Hodeida. In response to the outbreak, the following actions were implemented:

- ❖ all governorates alerted for detection of all acute flaccid paralysis cases;
- ❖ conduction of a house-to-house campaign in Hodeida and neighbouring districts;
- ❖ operation rooms established at central and governorate level;
- ❖ additional staff deployed in surveillance units;
- ❖ daily reporting on the situation established in the Ministry of Public Health and Population;
- ❖ a feedback mechanism established from the central level to governorates, and from governorates to districts;
- ❖ high priority given for collecting and sending samples;
- ❖ development of a policy for dealing with the media and press rumours;
- ❖ WHO sent different teams to assist in evaluating the situation, measures to be taken, implementation of national immunization days, and strengthening acute flaccid paralysis surveillance;
- ❖ postponement of the planned second round of national immunization days to allow time to secure mOPV and formulate microplans for house-to-house strategy;
- ❖ marking fingers and numbering houses.

Results of the campaign were evaluated by 36 international observers from the UN and other nongovernmental organizations. It was concluded that strong political commitment existed at all levels and house-to-house strategy was being well implemented; training, however, needed to be improved.

Factors which contributed to the outbreak included population movement between endemic countries and polio-free countries; low routine coverage for the past few years, especially in Hodeida district, resulting in the accumulation of a large group of susceptibles; and cessation of national immunization days three years previously.

Future plans will focus on improving routine coverage, enhancing acute flaccid paralysis surveillance, conducting the third round of national immunization days in July 2005 and

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two further rounds in September and November 2005, with a potential four rounds scheduled for 2006.

## 4.12 Status of implementation of phase I containment activities

*Dr Humayun Asghar*

Out of the 18 currently polio-free countries, nine have reported completion of the laboratory survey and inventory phase I activities (Bahrain, Djibouti, Islamic Republic of Iran, Jordan, Lebanon, Libyan Arab Jamahiriya, Oman, Qatar and Saudi Arabia). Six are in the final stages with completion expected before the 2005 meeting of the Regional Certification Commission (Iraq, Kuwait, Morocco, Syrian Arab Republic, Tunisia, United Arab Emirates). Sudan was considered among the countries that completed laboratory survey and inventory phase I activities, but it has been dropped from the list due to current reinfection with wild poliovirus. Yemen has written its national plan, but its implementation has been delayed due to recent wild poliovirus outbreak. National containment coordinators have not been nominated in three countries (Afghanistan, Pakistan and Somalia). Efforts are continuing to resolve this issue with the governments.

As of 2004, 19 060 laboratories have been surveyed and only six laboratories have been identified as storing wild poliovirus material. Most of these belong to the regional network of national polio laboratories. Guidelines for documenting the quality of phase I containment activities were pilot tested in three countries (Islamic Republic of Iran, Oman and Saudi Arabia), and reports were submitted to the Regional Commission for Certification of Poliomyelitis Eradication through national certification committees. The Regional Certification Commission accepted the format, and suggested adding data tables in the reports. Other polio-free countries have been requested to submit their report to Regional Certification Commission. In this regard, WHO provided technical assistance through visits and consultation.

There is strong political commitment for containment activities. Future plans are to support the countries in completion and documentation of phase I containment activities, to encourage still endemic countries (Egypt and Pakistan) to start preparing the list of laboratories, and to prepare for global certification containment activities.

## 4.13 Regional certification: role of EPI managers

*Dr M.H. Wahdan*

A Regional Commission for Certification of Poliomyelitis Eradication was established in 1995 and has held 13 meetings so far. As part of the certification process, independent

national certification committees have been constituted by governments in each of the countries, except Somalia. Members of national certification committees do not have any direct responsibility for poliomyelitis eradication in their countries. However, they are responsible for reviewing the documentation provided by the national EPI and forwarding it to the Regional Certification Commission with their comments on the status of polio eradication in the country. National documents have been accepted from 17 countries. These are Bahrain, Djibouti, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen. All these countries are now submitting annual updates. It should be noted that since transmission has been re-established in Sudan and Yemen, they will be requested to resubmit their national documents after they have been polio-free for at least one year. As a step towards preparation for regional certification, final national documents have been solicited from seven countries (Bahrain, Islamic Republic of Iran, Oman, Qatar, Saudi Arabia, United Arab Emirates) that have been free of polio for 5 years or more and have completed phase I of laboratory containment. In addition, the Regional Certification Commission has also been reviewing provisional national documents of Palestine and of countries currently endemic (Afghanistan, Egypt, Pakistan) and of those that have been polio-free for less than 3 years (Somalia).

The EPI managers have an important role in the certification process. This role includes the implementation of EPI-related activities of certification standards, periodically assembling the data about the status of polio eradication on prescribed formats (national documentation, annual updates, final national document for regional certification) for review and validation by the national certification committees, participation in meetings of the Regional Certification Commission when reports from their respective countries are being discussed and, finally, collaboration with the national certification committees to ensure timely submission of reports to the Regional Certification Commission.

## 4.14 Preparedness for stopping OPV

*Dr Roland Sutter*

The polio eradication initiative has been making considerable progress since 1988 towards interrupting wild poliovirus transmission. Wild poliovirus type 2 was eradicated globally in 1999, and type 3 poliovirus circulation has become very focal. Only 6 endemic countries have never interrupted wild poliovirus transmission, and 16 countries have experienced wild poliovirus type 1 importation in 2004–2005. Continued

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use of OPV after worldwide interruption of wild poliovirus transmission will be associated with around 250–500 cases of vaccine-associated paralytic poliomyelitis, immunodeficient cases with long-term excretion of poliovirus, and outbreaks of vaccine-derived poliovirus.

Four vaccine-derived poliovirus outbreaks have been detected worldwide since 2000 (Hispaniola, Philippines, Madagascar and China), as well as earlier endemic transmission in Egypt. These outbreaks underscore the potential of OPV-derived viruses to mutate and acquire the neurovirulence and transmission characteristics of wild polioviruses. Because of the reversion threat, polio eradication is ultimately inconsistent with continued OPV use. WHO advisory committees reviewed these data in 2003 and 2004 and concluded that routine OPV use must be stopped globally shortly after interruption of transmission and at the time when population immunity and surveillance sensitivity will still be high. However, before OPV can be stopped the following six prerequisites have to be met.

1. Confirmation of interruption of wild poliovirus transmission globally.
2. Appropriate biocontainment of all polioviruses.
3. Establishment of a stockpile of mOPVs.
4. Highly sensitive surveillance for circulating polioviruses.
5. Procedure for internationally simultaneous OPV cessation.
6. Long-term routine polio immunization policy.

Countries are faced with two options for a long-term routine polio immunization policy, either stop all polio vaccination or switch to inactivated poliovirus (IPV). The key question that countries need to answer is whether there is a need to maintain population immunity against polioviruses after OPV cessation. Such a decision will likely depend on the current and future risks of bioterrorism, the coverage anticipated with IPV (which probably will be similar to DTP3 coverage), the projected costs of IPV, and the opportunity costs of using IPV (rather than using the funds for higher-priority diseases, such as HIV, malaria or tuberculosis). It is very unlikely that low IPV coverage (less than 90%) in developing countries will have a measurable impact on poliovirus transmission. Some industrialized countries have already decided to continue the use of IPV after OPV cessation because of the perceived risk of bioterrorism and to deter future events. WHO is in the process of evaluating the potential for replacing wild poliovirus strains with Sabin strains for IPV production. If successful, any new producer must use the Sabin strains in IPV production. WHO plans to seek a resolution from the World Health Assembly in 2006 for endorsement of certain actions:

- ❖ halting the use of OPV;
- ❖ biocontainment levels for Sabin and wild polioviruses in laboratories and production sites;
- ❖ restriction of proliferation of wild poliovirus amplification sites for IPV production.

To make a more informed policy decision on routine immunization, countries may need to conduct a country-specific risk-benefit analysis.

In summary, after eradication of wild polioviruses, OPV use must be discontinued. All options, however, will be associated with risks. While these risks for paralytic disease can be managed, it is not possible to eliminate all risks. The overriding priority for the polio eradication initiative is to interrupt poliovirus transmission globally, and to ensure that no children ever will suffer the crippling consequences of poliomyelitis.

### 4.15 Conclusions and recommendations of the Regional Technical Advisory Group on Poliomyelitis Eradication

*Dr Ali Jaffer Suleiman*

The follow-up on the recommendations of the second meeting of the Regional Technical Advisory Group (TAG) on polio eradication found that the majority of recommendations had been energetically pursued and had served to advance polio eradication in the Region. However, the TAG reiterates the need to further pursue additional funding from within the Region (R1).

Concerning importations of polioviruses, the Group recommended that the Member States should aim to limit the spread of any importation by eliminating any immunity gap in their child populations. This is most important in Djibouti, Somalia, and among the children of immigrant workers living either in countries of the Region or countries where national immunization days have not been recently conducted (R2). The regional TAG also urged the Regional Director to include the topic of polio eradication in the agenda of the Regional Committee in September 2005 (R3).

Regarding commitment to polio eradication, the regional TAG recommended that in-country international staff and visiting WHO/UNICEF advisers should ensure that national staff are fully aware both of the need to ensure effective immunization against polio, and for preserving acute flaccid paralysis surveillance through certification of polio eradication and cessation of OPV use (R4).

For immunization, the regional TAG urges that staff dealing with polio eradication aim to strengthen routine immunization

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as one of the key strategies of their work (R5). The TAG also recommended that the experience and benefits of the polio eradication initiative should be used to strengthen the development of routine immunization services (R6).

For Pakistan, the TAG stresses again the need to identify high risk areas and populations, mapping of risk areas, guaranteeing effective planning and management where it is most needed and in ensuring accurate feedback to responsible officials at the highest provincial and national levels (R7). The TAG also urges polio staff to capitalize on the initial involvement of senior provincial and district officials by ensuring regular follow-up, briefings and feedback to these officials to ensure continuity of their direct involvement (R8). Additionally, the TAG recommends the appointment of an experienced international adviser for the southern Punjab (R9). For Afghanistan, the TAG recommends a number of supplementary activities aimed at focusing attention on Urozgan and adjacent provinces (R10).

Regarding the Horn of Africa, the TAG gives high priority to ensuring much improved coverage during supplementary immunization activities in Somalia. The TAG recommends an urgent consultation to review data on the existing situation, to develop appropriate strategies and methods of implementation, and to identify resources needed (R11). In addition, WHO/EMRO and the Regional Office for Africa (AFRO) should establish a mechanism to ensure full coordination of polio eradication activities in the countries in the Horn of Africa (R12). WHO, probably through headquarters, should develop a coordination mechanism between EMRO and AFRO, involving countries of the Horn of Africa, Chad, Central African Republic and Democratic Republic of the Congo to counter the effect of surveillance gaps that could conceal potential foci for importations (R13).

Regarding the monovalent vaccine, the TAG recommends that mOPV1 be used in countries endemic for wild type 1 poliovirus and to ensure immunity in countries at high risk with an immunity gap (R14). The TAG also recommends that mOPV1 should be used to control the present volatile polio situation in Djibouti, Pakistan, Somalia and Yemen, emphasizing that tOPV will remain the vaccine of choice for routine immunization (R15). The TAG endorses the clinical trial of mOPV1 being planned for Egypt and urges that attempts be made to assess the vaccine's impact in terminating the epidemic in Yemen (R16). The TAG urges WHO to proceed with the development and licensing of a monovalent type 3 OPV, to allow its operational use as well as its need for the vaccine stockpile (R17).

Concerning surveillance, the TAG recommended that the programme of surveillance reviews should be prioritized so that the greatest attention is directed to those countries where sensitivity needs to be at its highest (R18). The TAG accepts the principle that national policy determines what constitutes a "hot" case and that this definition will continue to guide the urgency and intensity of epidemic investigation and the seniority of the staff conducting it (R19). The testing of samples from contacts of an acute flaccid paralysis case should receive priority in those areas where additional surveillance data are required, e.g. areas of conflict with limited access, remote areas difficult to visit and ensure specimen collection. However, investigation of cases when inadequate or no stool specimens have been collected from the index case should always be considered an indication for the collection of contact samples (R20). WHO should encourage national authorities to strengthen their support and commitment to the laboratory network in the Region. Support for improvement of laboratory facilities to BSL3 polio will be needed in one or more regional laboratories to allow them to be able to work in the post OPV era (R21).

Regarding South Sudan, the TAG recommended that WHO should guarantee the quality of the work of the polio staff by ensuring that all other programmes have adequate resources, both financial and personnel, to achieve their objectives without posing excessive difficulties for polio staff (R22). WHO should strengthen advocacy for polio eradication with national and international groups working in southern Sudan (R23).

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### 5. Control and elimination of vaccine-preventable diseases

#### 5.1 Maternal and neonatal tetanus elimination: global and regional situation, challenges and perspectives

*Dr F. Gasse*

Elimination efforts worldwide between 1980 and 2004 have reduced the neonatal tetanus burden from 850 000 annual neonatal tetanus deaths in 1985 to less than 180 000 deaths in 2004. Out of 162 developing countries, 52 countries were still to eliminate maternal and neonatal tetanus in 1999. By the end of 2004, six of these countries (Botswana, Eritrea, Malawi, Namibia, Rwanda, South Africa) and one state in India had achieved elimination. Forty-one countries have developed a plan of action to achieve maternal and neonatal tetanus elimination, and 4 have implemented tetanus toxoid supplemental immunization activities protecting 58 million women at risk. In the Eastern Mediterranean Region, 20.7 million women at risk received at least two protective doses of tetanus toxoid, but seven countries (Afghanistan, Egypt, Iraq, Pakistan, Somalia, Sudan, Yemen) have still to achieve the goal. A differential between DPT3 and tetanus toxoid coverage still persists in the seven countries in spite of efforts made to reduce the gap. Countries at risk face the challenge of reaching an important proportion of children and pregnant women with immunization.

All countries of the Eastern Mediterranean Region have developed a plan of action and implemented tetanus toxoid supplementary immunization activities appropriate to identified high-risk districts and have plans to expand these efforts in 2005, depending on the availability of resources. Two out of the 7 countries still at risk (Egypt and Iraq) have completed elimination activities and will be able to claim elimination by the global target of 2005. An estimated 17 million women at risk still need to be targeted in the 5 other countries to achieve regional elimination of maternal and neonatal tetanus.

To assist country efforts, an investment case (or funding proposal) has been submitted to GAVI requesting US\$ 83 million to conduct tetanus toxoid supplementary immunization activities in 28 countries, including Eastern Mediterranean countries, in order to achieve the target. Maternal and neonatal tetanus eradication is achievable in the Region by the end of 2007, providing accelerated efforts to implement tetanus toxoid supplementary immunization activities in all remaining high-risk districts is ongoing.

#### 5.2 Mumps: regional situation

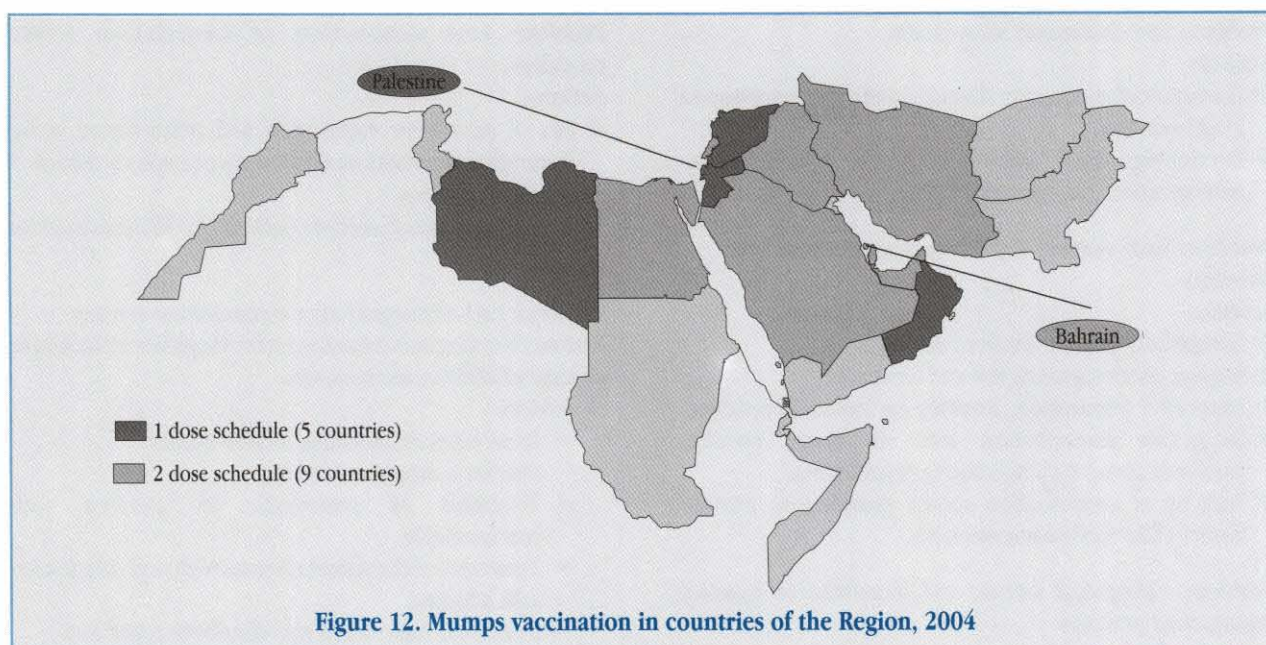
*Dr Nadia Teleb*

Mumps, or epidemic parotitis, is a generalized viral infection. The disease is generally a mild one that is asymptomatic in a third of cases. Symptoms include mainly inflammation of the parotid glands; occasionally sub-mandibular and sublingual glands are affected. In unvaccinated populations, it is a disease of young school children. Complications are higher if the disease affects adults and includes orchitis in 25%–38% of affected post-pubertal males, and oophoritis up to 5% of post-pubertal females. The central nervous system is affected in 4%–5% (usually mild deafness, aseptic meningitis; rarely, encephalitis can result in death) and pancreatitis might occur in up to 4% of the cases.

Several mumps vaccines are available in different combinations with measles and rubella vaccines. Available mumps vaccines show considerable variations in their immunogenicity, effectiveness and reactogenicity. A decision on whether to introduce mumps vaccination should be based on disease burden, presence of appropriate immunization schedule and vaccination coverage that support introduction of a new vaccine, affordability of the costs and sustainability of the introduced vaccine and other disease prevention and control priorities. **Countries introducing mumps vaccine should set disease control targets and design their vaccination strategy accordingly. Introduction of mumps immunization should only be considered in countries that have or are establishing adequate vaccination programmes for measles elimination and rubella elimination/congenital rubella syndrome control.**

Mumps vaccine was introduced in the routine immunization programme (as measles-containing vaccine) in 14 countries of the Region (Bahrain, Egypt, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Oman, Palestine, Qatar, Saudi Arabia, Syrian Arab Republic and United Arab Emirates) (Figure 12). Of these countries, 5 are using one-dose schedule (Jordan, Libyan Arab Jamahiriya, Oman, Palestine, Syrian Arab Republic) and the others use two-dose schedule. Six countries (Bahrain, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates) have also used mumps-containing vaccine in measles supplementary immunization activities. It is to be noted that in all these countries introduction of mumps vaccine was unintentional (as measles-containing vaccine). None of these countries have set disease control targets and designed their vaccination strategy accordingly. According to the information reported through a specifically designed questionnaire, 10 out of 16 respondent countries consider that mumps is not a priority disease. Only 8 countries included mumps in their reporting

## Control and elimination of vaccine-preventable diseases



system and only 3 countries have laboratory capacity for confirming mumps.

Several countries in the Region suffered from outbreaks of mumps after vaccine introduction, which might be a result of changing disease epidemiology as a result of the unplanned introduction of the vaccine. It is crucial to evaluate the situation of mumps in each country and set the control targets and suitable strategy. However, such activities should take into consideration other priorities and the country situation with regards to measles elimination and rubella/congenital rubella syndrome elimination and control.

### Discussion

- ❖ Monitoring of routine tetanus toxoid immunization activities and the most suitable indicators were discussed: two doses of tetanus toxoid and/or protection at birth. It was observed that in countries with strong routine EPI, most of the women of childbearing age are already protected despite the low reported tetanus toxoid coverage. Protection at birth in such cases is clearly the most appropriate method, as it takes tetanus toxoid immunization history and gives EPI staff the opportunity to identify and catch up defaulters.
- ❖ The importance of tetanus toxoid supplementary immunization activities was highlighted, particularly in areas where women have no access to antenatal care (three rounds are needed), and the importance of close monitoring of the coverage by round and by dose was discussed. Technical guidelines are available and have proved successful.

- ❖ Keeping track of personal vaccination history against tetanus toxoid, particularly doses received during infancy, and building on this through provision of booster doses in older age groups (GIVS). This can easily be done in countries with strong routine EPI and functioning school health programmes.
- ❖ The need for a close collaboration with maternal and child health to ensure immunity during pregnancy was noted.
- ❖ The role of advocacy and political commitment in reaching the elimination goal on time were highlighted.
- ❖ The main discussion regarding mumps was on the impact of "accidental use" of mumps vaccine on the natural epidemiology of the disease (most of the countries in the Region are using mumps as a measles-containing vaccine and do not have any clear strategy for mumps). Participants also raised the issue of the most appropriate vaccination schedule for mumps and how to conciliate with measles and rubella, and the urgent need for countries already using mumps vaccine to include mumps surveillance in vaccine-preventable diseases surveillance systems.

### 5.3 Group work

#### *Group 1. Maternal and neonatal tetanus elimination: progress, challenges and future plans*

The group discussed the problems relating to maternal and neonatal tetanus elimination and proposed appropriate actions for overcoming them.

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**Problem:** Low community involvement

**Actions:**

- ❖ Formation of community shura councils with involvement in EPI activities.
- ❖ Developing and implementing a comprehensive immunization communication plan.

**Problem:** Small number and low competency of service providers

**Actions:**

- ❖ Competency-based refresher training.
- ❖ Regular performance review and feedback.
- ❖ Supportive supervision, focusing on outreach activities.
- ❖ Integrating immunization into all formal medical, paramedical and nursing training programmes.
- ❖ Training of immunization service providers to provide further child survival interventions.

**Problem:** Suboptimal vaccine and immunization logistics management practices

**Actions:**

- ❖ Developing standard operating procedures.
- ❖ Proper stock control procedure at all levels.
- ❖ Training of cold chain technicians, managers and supervisors on standardization of procedures.
- ❖ Proper estimation/forecast, reporting and recording of needs at all levels.

**Problem:** Missed opportunities

**Actions:**

- ❖ Delivery of one-stop maternal and child health package.
- ❖ Relocation of immunization service delivery point (EPI centre) to integrate immunization with other maternal and child health services.
- ❖ Integration of immunization service delivery with other maternal and child health services delivery in outreach areas.

**Problem:** High drop-out rates

**Actions:**

- ❖ Interpersonal communication skills training of immunization service providers.
- ❖ Outreach planning, including mapping of catchments area, target setting, developing community health calendar and progress tracking for each team.
- ❖ Monthly drop-out reviewing and reporting and involving community health workers and community health services in tracing and retrieving drop-outs.
- ❖ Orientation of all staff of health facility on immunization (to provide back-up).

**Problem:** Low accountability of immunization service providers

**Actions:**

- ❖ Mix of supportive supervision and performance audit, documented feedback, and follow-up on implementation of recommendations.
- ❖ Revised salaries and incentive packages for EPI health service providers.

**Problem:** Lack of integration of immunization services

**Action:** Providing immunization services together with a simple package of effective interventions:

❖ Services

- Immunization, including tetanus toxoid.
- Vitamin A supplementation.
- Treatment of pneumonia in children with cotrimoxazole.
- Treatment of diarrhoeal diseases with oral rehydration salts and zinc.
- Insecticide-treated bed nets distribution and anti-malarial drugs.
- Iron foliate supplements to mothers and albendazole to all pregnant women.
- De-worming six monthly to children aged under five.
- Postnatal home visits.

❖ Information, education, communication and participation

- Identification/allocation of a fixed place for periodic community outreaches.
- Advance planning and community health activity calendar.
- Empowerment of care providers (standard communication package).

❖ Management support

- Develop policy, guidelines and tools for integrated child survival intervention package.
- Develop integrated home-based maternal and child health card/booklet and a corresponding facility/outreach based record.
- Develop integrated maternal and child health intervention coverage reporting system.
- Develop integrated logistic system.
- Develop integrated supervision, monitoring guidelines and tools.
- Review job description of staff.
- Review and finalize the incentive package for vaccinators.
- Develop an incentive package for the community health workers (per diem, one day for community mobilization and one day for the community outreaches days)
- Provide competency-based training of all concerned staff.

## Control and elimination of vaccine-preventable diseases

- Reorganize facility-based and outreach-based service delivery stations to bring all maternal and child health services delivery, including immunization, to one station.
- Supervise and monitor the project implementation on a regular basis and provide feedback.
- Evaluate the intervention after 6 months and recommend further expansion plans and adjustments, if necessary.
- Make the delivery of the integrated child survival intervention package a mandatory part of the contract with the basic primary health service implementers in future.

### Group 2. Mumps

Mumps is considered an endemic disease in Jordan. Epidemiological data show that between 9000 and 12 000 cases of mumps have been reported in recent years (8930 in 1998, 11 612 in 1999 and 16 122 in 2000). In March 2000, measles–mumps–rubella (MMR) vaccination was introduced for children aged 18 months as a second dose for measles and first dose for rubella and mumps. Vaccination coverage has since ranged between 80% and 90%, which has resulted in a decrease in mumps cases and a shifting in affected age group from children under five those aged 5–14 years. In 2004, 5771 mumps cases were reported, 80% of which occurred among children aged 5–14 years. Accordingly, the Ministry of Health gave instructions to strengthen mumps surveillance and reporting, as well as case management. A plan to vaccinate school children with MMR over a 3-year period was developed: the first phase, targeting children aged 8–16 years, was conducted between February and May 2005.

In Palestine, MMR was introduced into routine EPI in 1988. This has resulted into a clear decrease in reported mumps incidence (Figure 13). In late 2004, an outbreak started in Naplouse and then expanded to other areas. The age group most affected was 6–11 years, followed by those aged 11–15 years. The outbreak was well investigated by the Ministry of Health in collaboration with WHO, UNICEF and CDC Atlanta. As a result, and in order to prevent such outbreaks in the future, experts recommended a vaccination campaign targeting children aged 6–18 years, introducing a second routine dose and improving surveillance system. Accordingly, a vaccination campaign was conducted in 2005 (around 617 000 children aged from 6–18 years have received the vaccine) and a second routine MMR will be added to routine EPI schedule early in 2006. During that campaign, 6563 adverse events following immunization were reported, including 6091 parotiditis and 441 aseptic meningitis.

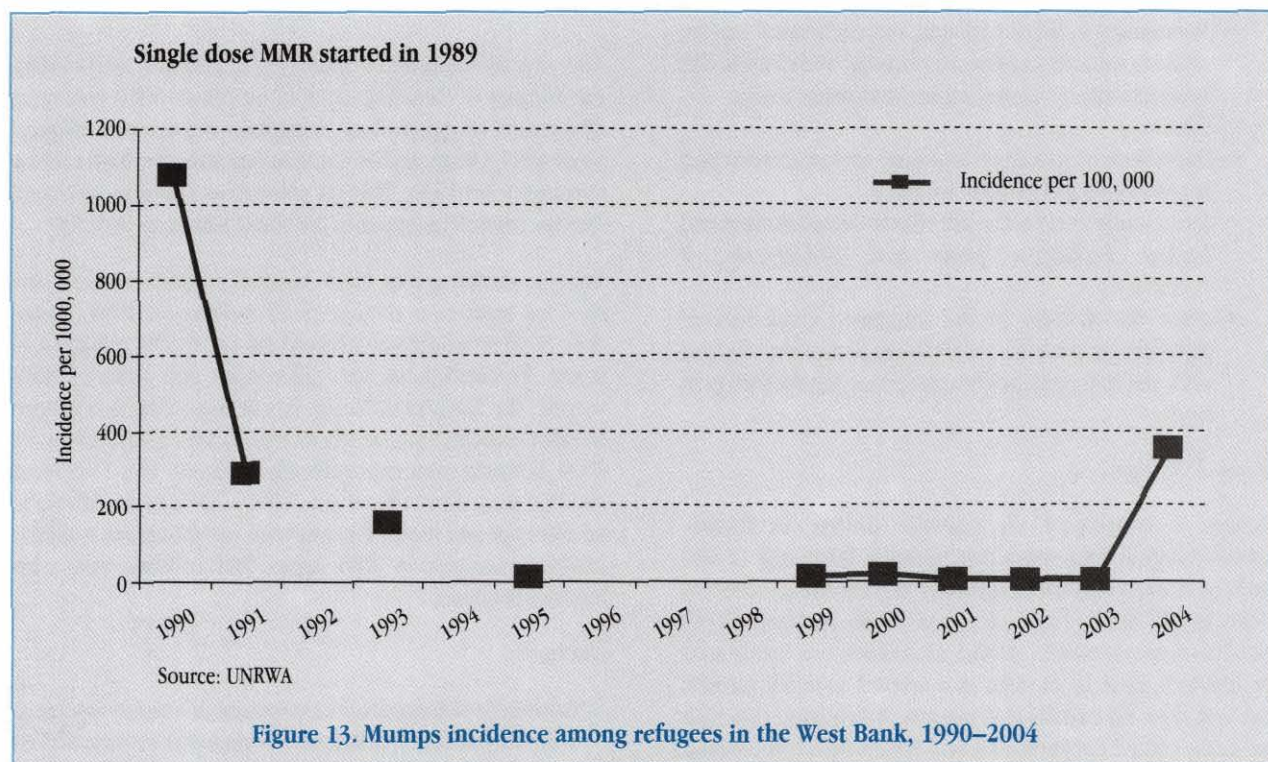
After several outbreaks in Oman (1991–1992 and 1995–1996), the Ministry of Health decided to introduce MMR vaccine at 15 months of age and to strengthen mumps surveillance. Since 1997, Oman has been able to maintain very high routine coverage (over 95%). This has resulted in a clear reduction of mumps cases (1664 cases in 2003 and 829 cases in 2004).

Bahrain started giving MMR vaccine in 1985, as a second dose for measles at the age of 15 months. In 1998, a two-dose MMR schedule was adopted (at 12 months and age 4–6 years). To catch those who did not get two doses of MMR vaccine, the Ministry of Health has been providing one dose of MMR through routine school vaccination programmes. In 2000, however, a mumps outbreak occurred. 99% of affected children were non-Bahraini students, who came to Bahrain at an older age and most of whom were not protected. A similar outbreak occurred in 2005; again, 99% of cases were non-Bahraini students.

### Discussion

- ❖ It was acknowledged that introduction of mumps vaccine as a measles-containing vaccine, as opposed to monovalent measles vaccine, had occurred without clear objectives and strategies in the majority of countries.
- ❖ The type of mumps vaccine and adverse events following immunization-related issues were discussed.
- ❖ The most adequate schedule was debated, in terms of number of doses needed to avoid outbreaks such as those in Palestine and Jordan.
- ❖ The importance for countries that have already introduced the vaccine to set up or strengthen mumps surveillance, with laboratory support whenever possible, was highlighted. Participants stressed the point, however, that focus should remain on measles and rubella; mumps surveillance should not overload measles and rubella laboratories.
- ❖ The current WHO position on mumps and the need to revise it in light to the current situation was highlighted.
- ❖ Participants made a clear request to WHO to hold a regional consultation on mumps and provide technical advice/support to countries.

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# Routine immunization

## 6. Routine immunization

### 6.1 Routine EPI in the Eastern Mediterranean Region: achievements and challenges

*Dr Ezzeddine Mobsni*

The main EPI goal is to protect communities against a range of prevalent vaccine-preventable diseases, through universal use of high quality vaccines and safe immunization practices. There are some basic principles to be considered by all national immunization programmes in reaching this goal, such as expanding immunization beyond infancy and current age groups, more community participation and social mobilization, securing regular supply of good quality and safe vaccines, reaching every child in the community, introducing new vaccines, strong and sustainable vaccine delivery systems, and strong monitoring and surveillance systems.

With these principles in mind, and in addition to such global milestones as the GAVI second goal (by 2010, all countries will have routine immunization coverage at 90% nationally, with at least 80% coverage in every district), it is clear that much effort is still required in several countries of the Region, particularly in "priority countries" which have been unable to reach 90% DPT3 coverage at national level and where around 95% of the unvaccinated children in the region live (Afghanistan, Djibouti, Pakistan, Iraq, Somalia, Sudan and Yemen). In those countries, despite enough financial resources made available through GAVI support, routine EPI remains weak for several reasons, including: insecurity; weak management; lack of ownership, of responsibility and accountability; and inadequate use of existing strategies such as the routine EPI programme. All remaining 15 Eastern Mediterranean countries have been able to achieve and maintain routine DPT3 immunization coverage of more than 90% at the national level; however, in some of them (Egypt, Jordan, Lebanon, Libyan Arab Jamahiriya, Morocco, Syrian Arab Republic and Tunisia) there are still some districts with reported coverage figures below 80%.

Regarding new vaccines introduction, Eastern Mediterranean countries have made good progress. All countries, except Djibouti, Afghanistan and Somalia, have introduced HepB vaccine, with Djibouti and Afghanistan planning for 2006 through GAVI support. However, Hib vaccine remains underused despite all the support provided to document the disease burden and raise decision-maker's commitment.

In addition, monitoring routine immunization services and their impact on vaccine-preventable diseases is still weak in several countries, particularly in terms of using data for action,

laboratory use for vaccine-preventable diseases surveillance, and coordination between different departments. Added to this is the poor coordination and integration with other primary health care interventions in almost all the above-mentioned priority countries, as well as poor social mobilization and community involvement, poor vaccine management, and high dependency on donors and extrabudgetary funds to run the routine immunization programme.

### 6.2 Improving routine immunization in Sudan and Yemen: achievements and challenges

*Dr El Tayeb El Sayed and Dr M. Al Imad*

#### *Sudan*

Sudan has undergone major reforms with great emphasis on improving routine immunization in the country. **Firstly, focus has been on designing and strengthening governance tools** in terms of drafting a comprehensive child health policy, with EPI as an integral component involved in strategic planning processes at the Federal Ministry of Health and leading an effective coordination through the interagency coordination committee. A strong database was developed and is currently used by the Federal Ministry of Health and other partners as a reference for other programmes and interventions. **Secondly, the programme worked in the area of resource development where capacity building has been given a much higher priority.** Training sessions were conducted, mainly addressing management and microplanning issues, and standard operating procedures have been developed. Rehabilitation of the infrastructure (cold chain and transport) has been initiated with support from WHO and UNICEF and GAVI funds have been used to strengthen routine immunization and mobilize local resources in different states. **The third area was service delivery where the RED approach has been used as a strategy to increase routine immunization and address issues of access and utilization, with great emphasis on strengthening the district health system.**

As a result of these activities the immunization system has been strengthened and the immunization network expanded, with much focus on sustained outreach services whereby outreach posts were increased from 2059 in 2001 to 4048 in 2004. The fixed immunization sites also increased from 860 in 2001 to 1153 in 2004 with the deployment of much of the new cold chain equipment to the peripheral health centres. The mobile teams increased to 410 in 2004 compared with 240 teams in 2001.

With the cooperation of partners including GAVI, most planned objectives have been achieved. DTP3 coverage in

## Twenty-second meeting of national EPI managers

Sudan increased from 64% in 2002 to 79% by end of 2004. The number of states achieving 80% coverage increased from 7 in 2002, to 10 in 2003, to 14 in 2004. Up to 49% of the localities have now achieved coverage of more than 80%, compared to 23% in 2001.

Regarding measles elimination, Sudan is within the control group where reduction of mortality and morbidity has to be achieved. Sudan ICC approved the 5-year national EPI plan of action (2001–2005) for measles mortality reduction that was revised and updated in 2003 in collaboration with WHO, CDC Atlanta and UNICEF. The plan has to be implemented in four phases. Three of these phases have been implemented and the overall measles vaccination coverage in northern Sudan was 98% whereby more than 8 million children aged from 9 months–5 years were vaccinated. The remaining challenges in Sudan include improving access to quality immunization services in all districts, especially in conflict-affected areas. Issues regarding financial sustainability also need to be addressed as the financial sustainability plan has revealed a significant financial gap in 2006. The EPI needs to work in close cooperation with other primary health care programmes and take the lead in the integration of primary health care services focusing on strengthening the district health system. Human resource development and community mobilization and ownership of the programme have to be examined in the near future.

### Yemen

Yemen has seen improvements as a result of the national immunization programme from 2003 to 2004:

- ❖ the number of districts with less than 70% coverage was reduced from 211 to 132, and districts with over 70% coverage increased from 121 to 200;
- ❖ districts with poor accessibility decreased from 37% to 22%;
- ❖ districts with good utilization improved from 7.4% to 17%;
- ❖ introduction of pentavalent vaccine in March 2005;
- ❖ training of 2820 health workers;
- ❖ formulation of a microplan for 200 districts;
- ❖ Government took responsibility for the budget for routine vaccination;
- ❖ Financial sustainability plan was finalized and sent to GAVI on time (February 2005);
- ❖ Auto-disabled syringes are available and utilized in all vaccination sites;
- ❖ proposal for national mass measles campaign was prepared and presented to donors (WHO, World Bank, CDC Atlanta, Japan International Cooperation Agency).

### Discussion

- ❖ Coverage in Yemen has increased to 12% mainly through the implementation of supplementary immunization activities. This strategy is difficult to sustain, and Yemen (as well as other priority countries) has to consider strengthening the routine system through operational districts microplans, using an adequate balance between fixed, outreach and mobile strategies according to district situation and specificity.
- ❖ EPI managers are well aware what the main constraints are that routine EPI faces in their countries. Accordingly, there is no further need to debate and analyse these constraints. It is known, for example, that they are not money-related; rather, they are linked to poor management, lack of responsibility and accountability and poor social mobilization. Specific, operational and pragmatic solutions need to be implemented immediately with close monitoring and strong evaluation. Poor management has been a challenge for 8 years.
- ❖ EPI has always been a leader for primary health care services, and several countries in the Region have used routine EPI as a locomotive to increase performance and access to other preventive programmes; some countries have even built their whole health system on EPI. The confidence health deciders have in routine EPI should be used by national EPI managers to obtain greater engagement and support from their respective governments in favour of routine EPI.

### 6.3 Group work

#### *Group 1. Achieving 90% coverage at national level and 80% in every district by 2010: challenges and strategies*

Participants shared experiences with a special focus on the constraints national EPI are facing, and proposed country-specific strategies to overcome these constraints to reach the 2010 goal. Some examples are highlighted below.

In Djibouti, there is a lack of understanding of key issues such as cold chain issues, immunization system, reporting system and vaccine management. Immunization is not a priority on the agenda of the decision-makers, and managerial skills are limited at all levels, with absence of a committed EPI national manager. Actions needed include:

- ❖ in-depth EPI review to identify problems and give visibility to EPI
- ❖ nomination of a national EPI manager
- ❖ reinforcement of the RED Approach (already started)
- ❖ identification of an EPI focal point in each district

## Routine immunization

- ❖ finalization of district microplans and assist local teams in implementation
- ❖ reinforcement of supervision and social mobilization.

In Pakistan, priority problems include lack of awareness of routine EPI importance by key politicians and executives; inadequate supervision and monitoring at district level; maldistribution of field staff; expansion of EPI fixed centres; and insufficient logistic support (mobility for supervision and

for service delivery). Potential solutions are as follows:

- ❖ Advocacy meetings at national, provincial and district level
- ❖ Training on quality supervision and monitoring emphasis on data collection, analysis
- ❖ Advocacy meetings and local level arrangement
- ❖ Utilization of available health facilities and resources
- ❖ Timely and proper utilization of available resources.

| Sudan                                                                 |                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Root causes                                                           | Proposed solutions                                                                                                                                                                                                                                 |
| Lack of access (physical, geographical and security)                  | Increase number of fixed sites (60%), sustained outreach services (30%) and mobile teams for remote areas (10%)<br>Acceleration campaigns for inaccessible areas and where there are windows of opportunities in unsecured areas                   |
| Denominator and demographic limitations                               | Census, birth registration<br>Best estimates have to be made with projections from the last census<br>National immunization days<br>Local community figures                                                                                        |
| Insufficient human resources                                          | Recruitment<br>Salaries, per diems<br>Deployment and transfer to needy areas<br>Physical availability<br>Capacity building, basic and refresher training, mid-level management<br>Integration with other programmes/ services<br>Use of volunteers |
| Inadequate health system and infrastructure                           | Develop a national plan and budget. Seek external assistance                                                                                                                                                                                       |
| Logistics and operational cost                                        | Advocacy for external assistance (interim)                                                                                                                                                                                                         |
| Lack of social mobilization and community participation and ownership | Develop a national plan and strategy, budget; seek external assistance                                                                                                                                                                             |
| Partnership and coordination issues                                   | Effective ICC to provide legislation and governance                                                                                                                                                                                                |
| Competing priorities                                                  | Develop integrated, comprehensive plan; revise terms of reference                                                                                                                                                                                  |

### Group 2. How to maintain high routine immunization coverage and expand immunization beyond current age groups

#### Actions

- ❖ Make completing basic vaccine doses compulsory at school entry.
- ❖ Explore ways to collect data on immunization activities of the private sector (through clinicians or suppliers).
- ❖ Document individual vaccine administration on standard health document (vaccination card, health record).
- ❖ Establish a national regulatory body and mechanism to ensure safety vaccine procurement to both public and private sector.
- ❖ Ensure that private sector includes all basic vaccines of the EPI.
- ❖ Develop methods for social mobilization to promote routine immunization.
- ❖ Countries with high national coverage to look for missed children.
- ❖ Coordinate all immunization activities targeting children, adults, high-risk groups and migrants within a national coordinating body.
- ❖ Establish written protocols for health workers in both public and private sectors on standard procedures on immunization practices.

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- ❖ Continue monitoring adverse events following immunization.

### Support required

- ❖ Regular supply of vaccines.
- ❖ WHO technical assistance and training in introducing new vaccines.
- ❖ WHO assistance for vaccine producer countries in developing their techniques.
- ❖ WHO written recommendations on influenza vaccine programme.
- ❖ Information education communication materials for promoting routine immunization.
- ❖ Support in implementing seroprevalence survey to evaluate situation of congenital rubella syndrome.

### *Group 3. "No children will die from a vaccine-preventable disease": pertinence, feasibility, challenges and strategies*

The group agreed that the goal is pertinent and relevant and is in line with the fundamental health policies of the Gulf Cooperation Council states as well as to the overall principle of preservation of the child's right. Participants agreed that it is essentially applicable to the original 10 antigens included in the EPI, and that newer life-saving EPI vaccines would be included on the list if and when evidence-based knowledge becomes available. The group agreed that to materialize this vision, countries should:

- ❖ improve routine coverage to reach up to 100% of target population, including underprivileged populations;
- ❖ find gaps in the surveillance of all vaccine-preventable diseases in order to strengthen and improve quality;
- ❖ follow-up susceptibility profile of the population;
- ❖ improve case management;
- ❖ monitor and evaluate all EPI components and their impact on incidence;
- ❖ develop and use appropriate indicators;
- ❖ ensure vaccine availability and safety by providing the national regulatory authority with a common mandate.

### **6.4 Pakistan study on barriers to routine EPI**

*Mr Q. Abbasi*

In order to better understand the obstacles facing immunization delivery services, a technical independent firm has undertaken an analysis of EPI in Pakistan. The scope of the study was to give insights into policy environment, the implementation barriers and infrastructure problems relating to the routine immunization system in the country.

The information generated will help to identify alternative strategies that could be integrated with existing EPI and its policies.

The study focused on two areas: the EPI service delivery system, and knowledge, attitude and practices of parents in relation to child immunization. Two phases have been conducted to achieve the study objectives: situation analysis through reports and data review, and actual field review of the system in eight study districts throughout four provinces. The study was conducted in two districts in each province, one with high DPT3 coverage and one with low DPT3 coverage. The findings of the study are given below.

### Management

- ❖ There was a need for national policy for EPI (national policy approved and published after study).
- ❖ Administrative and budgetary powers are needed at district level.
- ❖ Health monitoring committees were not yet fully functional.
- ❖ The activities of vaccinators were not always monitored within health facilities.
- ❖ Districts with low coverage had limited outreach activity.
- ❖ Development of monthly outreach plans was hindered by increased frequency of national immunization days/sub-national immunization days, especially in low DPT3 districts.
- ❖ In some districts, monthly meetings of vaccinators were irregular.
- ❖ There was a low number/quality of supervisory visits in low DPT3 districts.
- ❖ The active involvement of district EPI teams in finalizing outreach plans in high DPT3 districts was noted.

### Financial

- ❖ No major issues regarding the disbursement/availability of EPI funds existed at federal and provincial level.
- ❖ There was no separate budget allocation for EPI-specific activities (fuel, maintenance, etc.).
- ❖ The fixed fuel policy across Pakistan affects supervisory activities.
- ❖ Delayed release of funds for the repair and maintenance of the cold chain and transport affects performance.

### Human resources

- ❖ Vacant posts at federal and provincial level.
- ❖ More supervisory staff needed for monitoring and evaluation of EPI.

## Routine immunization

- ❖ The policy of one vaccinator needs to be revised with population growth.
- ❖ Local health workers could be beneficial for EPI beyond the social mobilization aspect.
- ❖ Training:
  - duration of basic training different in provinces;
  - technical knowledge of vaccinators adequate.
- ❖ Accountability/motivation:
  - no incentives or accountability;
  - diminishing motivation of field staff.

### EPI logistics

- ❖ Availability and distribution of vaccines and syringes:
  - need for logistic and vaccine management system strengthening;
  - need for adequate transport for transportation of vaccines in certain districts;
  - occasional stock deficits in low DPT3 coverage districts.
- ❖ Cold chain
  - tedious repair and maintenance process.
  - low voltage, electricity failure and frequent fluctuations remain a major hindrance for smooth functioning of the equipment.
- ❖ Vehicles and transportation
  - lack of appropriate vehicles in relation to geographic dynamics of catchment areas;
  - fuel policy.

### Parents' knowledge, attitude and practices survey

- ❖ The vaccination status of children is dependent upon the literacy level of parents, especially mothers.
- ❖ Awareness/knowledge indicators are relatively lower in low DPT3 coverage districts.
- ❖ Limited penetration of media in low DPT3 districts.
- ❖ Lack of social mobilization activities for EPI.
- ❖ Vaccinations are highly acceptable to the community.
- ❖ Infrequency of static centres and non-availability of immunization at doorstep.

### Discussion

Much discussion centred around the participation criteria to this course and the importance of a perfect vaccine management system in every Member State. It was clarified that this course is in fact open to participants from countries where the central vaccine store as well as the vaccine management system were assessed, and the objective of the assessment is not to obtain certification, but to identify gaps

and propose corrective measures that will ensure vaccine quality and safety at country level. In addition, the Regional Office, in collaboration with WHO headquarters, is planning to provide more support to Member States in the area of vaccine procurement, mainly through building human capacity.

### 6.5 Briefing on the global training centre on vaccine management in Oman

*Salah Al Awaidy*

The global training centre on vaccine store Management in Oman was initiated in 2003 as part of the effective vaccine store management tool. At present, very few countries of the Region have been involved in assessment or in attending courses.

Suggested participants for the global training centre include EPI managers, vaccine cold store/cold chain managers, or any other persons holding a title related to vaccine store management. Sub-national level vaccine store managers will also be accepted for training only after national level vaccine managers have been trained. In summary, attendance of the course will help Member States to identify gaps in their vaccine store management as well as improving their management knowledge.

### 6.6 NESI report on collaboration between academia and national EPI since last year's intercountry meeting

*Dr Amr Abbassy*

One of NESI's primary activities is to stimulate awareness about the importance of EPI training in pre-service health training institutions. NESI works in close collaboration with WHO and other GAVI partners to raise awareness, to advocate and to develop curricula in the area of immunization education in the African and Eastern Mediterranean Regions.

Although immunization is one of the most effective and widely implemented global health interventions, the majority of future health professionals often receive little or inadequate exposure to the topic during pre-service education. Health professionals begin their practice lacking knowledge, skills and attitudes related to immunization and with little awareness of their role in EPI.

The specific objectives of the previous intercountry meeting were to:

- ❖ build awareness of the need for EPI training in pre-service training institutions;
- ❖ promote the integration of EPI training into curricula of health training institutions;

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- ❖ describe the status of immunization training and identify potential EPI needs in pre-service institutions;
- ❖ familiarize participants with the modules of Immunization in Practice;
- ❖ generate the next steps to improve EPI training in health training institutions.

The current status of EPI training in health training institutions was discussed and participants generated the following strategies.

1. Develop universal guidelines regarding the structure and content of EPI training as a baseline that each country could adapt to make country-specific.
2. Integrate EPI into all relevant training (basic sciences, clinical, public health and socio-behavioural modules).
3. Pilot the introduction of immunization training in high schools and require students to utilize EPI assessment checklists during field activities.
4. Ensure all university libraries possess updated EPI reference materials.
5. Conduct more extensive follow-up and evaluation on the quality and impact of pre-service EPI training.
6. Develop content on the newer vaccinations and injection devices as they are implemented in the field.

### 6.7 Briefing on the Global Vaccine Research Forum

*Dr Hayam Bashour*

The Sixth Global Vaccine Research Forum, hosted by the WHO Initiative for Vaccine Research and GAVI, was held in Salvador de Bahia, Brazil from 12 to 15 June 2005. The Forum serves as a method to disseminate information to all partners and interested parties related to vaccine research, to provide advice on vaccine research and development projects within WHO, to exchange views on research agendas and to monitor the progress of the GAVI task force on research and development. The Forum also provides the opportunity for discussion of broader issues of vaccine policy and implementation.

The following topics were highlighted in the Forum.

- ❖ GAVI vaccine research and development projects.
- ❖ Hib introduction and challenges.
- ❖ Orphan vaccines, e.g. leishmaniasis.
- ❖ New regulatory approaches to vaccine licensing in developing countries.
- ❖ Prospects for new vaccines against influenza.
- ❖ Adjuvants and immunomodulators.
- ❖ New vaccines against *Shigella* and enterotoxigenic *Escherichia coli*.

- ❖ Development of vaccines against HIV, malaria, and tuberculosis.

The expanding role of public-private partnerships in developing vaccines for the world market was prioritized, given that vaccines are less attractive targets for commercial pharmaceutical development as existing vaccines are purchased only when the prices fall below the profit margin. Considering that the possibilities to develop new vaccines are immense, the keynote lecture recommended that good management structure has to be ensured in those partnerships, and success has to be measured.

The satellite symposium on the challenges to enteric vaccines stressed the global need for vaccines, especially the rotavirus vaccine. Typhoid and cholera are needed in high-risk settings. An obstacle to the wider use of vaccines is the lack of effective methods to communicate the importance of enteric infection and the potential of vaccines to save lives. Consideration for the investment case concept was stressed, plus the need for burden of disease studies by region. The satellite symposium on the ethical considerations related to the provision of care and treatment in vaccine trials presented historical perspectives of the past WHO/UNAIDS consultations and discussed a proposed matrix approach to guide practical action in the light of ethical principles.

Although the Forum is largely attended by scientists, vaccine producers and regulators, in many instances it was tackling vaccine utilization issues, burden of disease, etc. and thus clearly linking research to public health issues. The need for greater awareness among academics about the epidemiology of these diseases is, therefore, being addressed. Modules are being taught in English- and French-speaking countries and meetings are held to discuss and explain epidemiology to paediatricians. In addition, a revised curriculum for paediatrics is to be implemented.

### 6.8 Regional measles laboratory network

*Dr Hinda Ahmed*

The Regional Office has established a regional goal to eliminate measles by 2010, and laboratory support of surveillance is an indispensable element of the programme. Two regional reference laboratories and 20 national laboratories have been designated for the diagnosis of measles and rubella; 2 of the 20 were established early 2005.

For measles laboratory diagnosis it is recommended to use serological methods that measure virus-specific immunoglobulin M (IgM) antibody in serum samples. Most of the existing regional measles/rubella laboratory network

## Routine immunization

functions well and a significant improvement in the quality of case-based surveillance and laboratory data has been seen. All laboratory networks that participated in proficiency testing passed with results equal to or above 80%; however, two countries have not yet reported their results. Quality control procedures are implemented as the number of national laboratories sending samples for quality control is increasing in number, and three countries have passed accreditation review.

Constraints and challenges include:

- ❖ the logistical problem of specimen referral from districts to national laboratories and to regional reference laboratories for quality control;
- ❖ sharing information on a timelier basis;
- ❖ close collaboration of laboratory staff and epidemiologists;
- ❖ collection of clinical samples during outbreaks for virus isolation in laboratories with sufficient capacity, or sending clinical samples to regional reference laboratories to facilitate genotyping of circulating virus in the country or the Region;
- ❖ the need to establish sub-national laboratories to appropriately monitor and report disease from remote and geographically vast areas of some countries of the Region.

The Regional Office is committed to: assisting in building the mechanisms for laboratory network improvements; linking laboratory data and activities to surveillance; quality assurance through accreditation and the proficiency-testing programme; validating results; standardizing laboratory procedures; provision of supplies and equipment; feedback or laboratory reports; and capacity-building for laboratory personnel.

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## 7. Recommendations

### *General*

1. WHO should keep members of RTAG informed about main activities and events in the Region in the area of vaccine-preventable diseases and immunization.
2. The Regional Office should support and follow up progress in implementing RTAG recommendations on a regular basis, using the following mechanisms.
  - ❖ Providing a quarterly country report in a detailed format.
  - ❖ Including in the terms of reference of every immunization-related country visit a review of progress in the implementation of recommendations.
  - ❖ Reporting twice yearly to RTAG on regional and country progress and constraints related to implementation of the recommendations, as well as on regional activities conducted to support countries in overcoming these constraints.
3. The Regional Office should inform EPI managers in advance about the agenda of the next intercountry meeting and request their input for the selected topics.
8. Countries should report to WHO regarding negative rumours related to EPI and action taken; the Regional Office should share these experiences with other Member States and provide support needed.
9. All countries should conduct internal assessment of vaccine stores using the WHO-recommended tool, requesting WHO support when necessary. All countries should consequently consider participation in the vaccine management training course offered by the global training centre in Oman.
10. The Regional Office should consider including RTAG members in technical missions to the priority countries for advocacy.
11. The Regional Office should consider including EPI as a permanent topic on the agenda at the Regional Committee.

### *Routine EPI coverage*

4. All priority countries should conduct an in-depth review of EPI at the lowest possible administrative level to identify and solve the main constraints hindering progress in implementation of the planned necessary activities. Support should be sought from WHO as necessary.
5. Ministries of health in priority countries should review the situation in primary health care services to improve access and ensure that routine immunization services are a basic component in every health facility and are delivered adequately.
6. All priority countries should hold national EPI meetings to be attended by the executive bodies (ministries of health, finance, planning, education, etc.), legislative entities and other relevant partners in order to raise awareness, strengthen national commitment and develop pragmatic plans for strengthening EPI.
7. All countries should monitor EPI coverage at district level to identify low performing districts (less than 80% DPT3 coverage) and develop, implement and monitor specific microplans.
12. All countries of the Region should develop EPI multi-year action plans using WHO recommended tools and guidelines, and in line with global and regional goals and strategies.
13. All countries should review routine vaccination programmes and activities conducted through sectors other than EPI to ensure that they are coordinated, monitored and in line with regional and country policies, and that data are shared with EPI.
14. Countries who are not expanding immunization beyond infancy should consider adding regular booster doses to sustain immunity gained through primo-vaccination, according to WHO recommendations.
15. The Regional Office should develop a regional action plan for translating the two immunization-related visions into reality and present it to the next annual intercountry meeting of national EPI managers and to the Regional Committee in 2006.

### *Regional vaccine-preventable diseases surveillance network and GAVI Hib Initiative*

16. Countries should use all available opportunities to build upon the acute flaccid paralysis surveillance system and infrastructure to establish or strengthen national vaccine-preventable diseases surveillance system.
17. All countries that have not yet joined vaccine preventable diseases networks are encouraged to:
  - a) assess their current surveillance situation, including

## Recommendations

- the laboratory component (availability, quality, procedures, type of existing surveillance system, outcomes, etc);
- b) coordinate with all stakeholders in order to collect available information on the epidemiology of vaccine-preventable diseases in the country;
- c) identify gaps and develop an action plan to improve the surveillance system;
- d) join the regional surveillance networks.
18. The six GAVI-eligible countries in the Region should utilize the opportunity offered by the GAVI Hib initiative and submit proposals through the Eastern Mediterranean GAVI regional working group, either to strengthen (Pakistan, Sudan and Yemen) or initiate (Afghanistan, Djibouti, Somalia and south Sudan) bacterial meningitis surveillance activities according to current situation.
19. WHO should provide necessary support to all countries for developing and strengthening bacterial meningitis surveillance, invasive pneumococcal disease surveillance and rotavirus surveillance systems, as part of the regional networks.
20. WHO should support the countries eligible for GAVI support in their efforts to benefit from the GAVI Hib initiative.
- Maternal and neonatal tetanus elimination*
21. By end 2005, all countries that have not eliminated maternal and neonatal tetanus should review district-level data (using the spreadsheet recommended by WHO and UNICEF) to identify risk status and update plans for validating elimination or to accelerate the implementation of 3 tetanus toxoid supplemental activities and corrective measures based on that risk. Countries should request technical support from WHO to facilitate consensus on risk analysis.
22. Countries should use the review of district immunization performance to prioritize districts and promote activities that accelerate progress in routine coverage; this review should be conducted twice yearly.
23. The following recommendations were made to accelerate maternal and neonatal tetanus elimination based upon individual country reviews.
- a) Egypt and Iraq should complete the spreadsheet provided to review the maternal and neonatal tetanus elimination situation by district by September 2005 and send the documentation to WHO. If maternal and neonatal tetanus elimination is claimed, the validation process should begin during the first quarter 2006.
- b) Pakistan should implement corrective tetanus toxoid supplementary immunization activities in districts previously targeted but still at risk (class 2 and 3) in 2005 and plan for 2006 tetanus toxoid supplemental activities in remaining high-risk districts, based upon district risk assessment.
- c) Afghanistan should conduct the third round of tetanus toxoid supplementary activities jointly with measles in 2005 and plan to implement corrective rounds of TT supplementary immunization activities in districts which have not achieved at least 80% coverage with two doses of tetanus toxoid, based upon review of individual district performance
- d) Somalia should accelerate implementation of planned elimination activities in 2006 and complete implementation during 2006–2007.
- e) Yemen should implement the planned tetanus toxoid supplementary immunization activities, covering 2 million additional women at risk in 2006, and review district performance to target required corrective tetanus toxoid supplementary immunization activities by end 2006.
- f) Sudan should review district risk status and prepare an updated plan to achieve elimination during 2006–2007.
- g) All plans made to accelerate progress towards elimination should be cleared by ICC and funding gaps submitted to WHO and UNICEF for resource mobilization.
- Mumps and new vaccines introduction*
24. Countries where mumps vaccine has been introduced by public or private sector should establish adequate surveillance to monitor the vaccine introduction impact on the epidemiology of the disease and develop strategies and plans of action for mumps control and elimination.
25. All countries should study the epidemiology and burden of disease in the country, as well as the situation of the national EPI. This information should be used to decide on the necessity, priority and feasibility of introducing any new vaccine; and enable the development of clear objectives, strategies and a detailed action plan. To avoid the negative impact

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of changing epidemiology of the disease as a result of the unplanned introduction of new vaccine by non-Ministry of Health service providers, introduction of any new vaccine by any sector in any country should be in line with the national policy concerning a particular vaccine.

26. The Regional Office should hold a consultation to develop a regional strategy for mumps control and elimination and should advise Member States accordingly. Mumps should also be included on the agenda of the next measles/ rubella intercountry meeting, planned for September 2005.
27. WHO should update and revise its mumps position paper, taking into consideration the increase in number of countries using this vaccine and the trends in the global vaccine market.

# Programme

## Annex 1

### Programme

#### Monday, 4 July 2005

|                                |                                                                                                                                           |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 08:00–09:00                    | Registration                                                                                                                              |
| 09:00–09:30                    | Opening session                                                                                                                           |
|                                | Introduction of participants                                                                                                              |
|                                | Election of officers                                                                                                                      |
|                                | Adoption of the agenda                                                                                                                    |
| 09:30–09:50                    | Regional vision: the way forward/ Dr Z. Hallaj                                                                                            |
| 09:50–10:15                    | EPI Global Overview and Global Immunization Vision and Strategies (GIVS)/ Dr J. M. Okwo Bele                                              |
| 10:15–10:30                    | EPI regional overview and status of implementation of the 21st IC Meeting recommendations/ Dr S. Youssouf                                 |
| 10:30–11:30                    | Discussion                                                                                                                                |
| <i>Session I: New vaccines</i> |                                                                                                                                           |
| 11:30–12:00                    | Regional progress, challenges and perspectives/ Dr E. Mohsni and Dr N. Teleb                                                              |
| 12:00–12:20                    | Update on global vaccine supply and availability/ Dr F. Blanco                                                                            |
| 12:20–12:45                    | Discussion                                                                                                                                |
| 12:45–13:00                    | Update on latest development in priority vaccines/ Dr O. Afsar                                                                            |
| 13:00–13:15                    | Briefing on latest developments in cholera and typhoid vaccines/ Dr C.L. Chaignat                                                         |
| 13:15–14:30                    | Discussion                                                                                                                                |
| 14:30–15:00                    | Briefing on country costed multi-year plan/ Mr P. Lydon                                                                                   |
| 15:00–15:05                    | Introduction to working groups                                                                                                            |
| 15:05–17:00                    | Group work                                                                                                                                |
|                                | Group 1: Country implications and future steps                                                                                            |
|                                | Group 2: Costed multi-year plan                                                                                                           |
|                                | Group 3: Surveillance for new vaccine introduction (regional networks for rotavirus, bacterial meningitis, and pneumococcal surveillance) |
| 17:30–18:30                    | RTAG meeting                                                                                                                              |

#### Tuesday, 5 July 2005

##### *Session II: Poliomyelitis eradication*

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| 08:30–09:00 | Regional overview: progress and plans/ Dr F. Kamel and Dr H. Asghar                                  |
| 09:00–09:15 | Global overview/ Dr Roland Sutter                                                                    |
| 09:15–09:30 | Discussion                                                                                           |
| 09:30–09:45 | Pakistan: Improving quality of supplementary immunization activities: high-risk approach/ Dr M. Azam |
| 09:45–10:00 | Afghanistan: using monitoring data to guide strategies/ Dr T. Mir                                    |
| 10:00–10:15 | Use of monovalent vaccine (mOPV1): rationale and experience/ Dr Roland Sutter                        |
| 10:15–10:30 | Report on polio communication meeting/ Dr Essam Allam                                                |
| 10:30–11:30 | Discussion                                                                                           |
| 11:30–11:50 | Summary of surveillance reviews and issues/ Dr A. Elkasabany                                         |
| 11:50–12:10 | Follow-up on review recommendations/ Dr K. Baradei and Dr Assia Hmida                                |
|             | Tunisia                                                                                              |
|             | Syrian Arab Republic                                                                                 |
| 12:10–12:30 | Implementation of surveillance under conflict/ Dr Iyad Arafa and Dr Jihad Abed and Dr T. Mir         |
|             | Afghanistan, Palestine                                                                               |
| 12:30–14:00 | Discussion                                                                                           |
| 14:00–15:00 | Introduction: outbreak anticipation and SIA plans/ Dr M. Wahdan                                      |
|             | Sudan epidemic/ Dr El Tayeb El Sayed and Mr J. Abdel Wahab                                           |

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|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | Yemen outbreak/ Dr Ghada Al-Haboob                                                                                                                                                                                                                                                                                                                                                       |
|                                                                             | Saudi Arabia importation/ Dr Abdel Hafeez Turkistani                                                                                                                                                                                                                                                                                                                                     |
| 15:00–16:00                                                                 | Country statements and discussion                                                                                                                                                                                                                                                                                                                                                        |
| 16:00–16:15                                                                 | Status of implementation of Phase I containment activities/ Dr H. Asghar                                                                                                                                                                                                                                                                                                                 |
| 16:15–16:30                                                                 | Regional certification: role of EPI Managers/ Dr M. Wahdan                                                                                                                                                                                                                                                                                                                               |
| 16:30–16:45                                                                 | Preparedness for stopping OPV/ Dr Roland Sutter                                                                                                                                                                                                                                                                                                                                          |
| 16:45–17:00                                                                 | Discussion                                                                                                                                                                                                                                                                                                                                                                               |
| 17:00–17:30                                                                 | Conclusions and Recommendations of RTAG/ Dr A. Suleiman                                                                                                                                                                                                                                                                                                                                  |
| <b>Wednesday, 6 July 2005</b>                                               |                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>Session III: Control and elimination of vaccine-preventable diseases</i> |                                                                                                                                                                                                                                                                                                                                                                                          |
| 08:30–08:50                                                                 | Maternal and neonatal tetanus elimination: global and regional situation, challenges and perspectives/<br>Dr F. Gasse                                                                                                                                                                                                                                                                    |
| 08:50–09:10                                                                 | Mumps: regional situation/ Dr N. Teleb                                                                                                                                                                                                                                                                                                                                                   |
| 09:10–09:30                                                                 | Discussion                                                                                                                                                                                                                                                                                                                                                                               |
| 09:30–12:10                                                                 | Group work<br>Group 1. maternal and neonatal tetanus elimination: country progress, challenges and future plans<br>Group 2. Mumps vaccine introduction and impact on disease epidemiology                                                                                                                                                                                                |
| 12:10–12:30                                                                 | Presentation of group work on control and elimination of vaccine preventable diseases                                                                                                                                                                                                                                                                                                    |
| 12:30–14:00                                                                 | Discussion                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Session IV: Routine immunization</i>                                     |                                                                                                                                                                                                                                                                                                                                                                                          |
| 14:00–14:15                                                                 | Routine EPI in the Eastern Mediterranean Region: achievements and challenges/ Dr E. Mohsni                                                                                                                                                                                                                                                                                               |
| 14:15–14:45                                                                 | Improving routine immunization in Sudan and Yemen: achievements and challenges/ Dr El Tayeb El Sayed and Dr M. Al Imad                                                                                                                                                                                                                                                                   |
| 14:45–15:15                                                                 | Discussion                                                                                                                                                                                                                                                                                                                                                                               |
| 15:15–17:15                                                                 | Group work<br>Group 1. Achieving 90% DPT3 coverage at national level and 80% in every district by 2010: the challenges in priority countries<br>Group 2. How to keep with high routine immunization coverage and expand immunization beyond current age groups<br>Group 3. "No children will die from a vaccine-preventable disease": pertinence, feasibility, challenges and strategies |
| 17:30–18:30                                                                 | RTAG Meeting                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Thursday, 7 July 2005</b>                                                |                                                                                                                                                                                                                                                                                                                                                                                          |
| 08:30–08:45                                                                 | Pakistan study on barriers to routine EPI/ Mr Q. Abbasi                                                                                                                                                                                                                                                                                                                                  |
| 08:45–11:00                                                                 | Presentation and discussion of group work                                                                                                                                                                                                                                                                                                                                                |
| 11:00–11:15                                                                 | NESI report on collaboration between academia and national EPI since last year's meeting/ Dr Amr Abbassy                                                                                                                                                                                                                                                                                 |
| 11:15–11:30                                                                 | Briefing on the Global Training Centre on Vaccine Management in Oman/ Dr Salah Al Awaidy                                                                                                                                                                                                                                                                                                 |
| 11:30–12:15                                                                 | Briefing on the Global Vaccine Research Forum/ Dr H. Bashour                                                                                                                                                                                                                                                                                                                             |
| 12:15–13:15                                                                 | Briefing and discussion on updated regional strategy for measles/rubella elimination and control/ Dr A. Golaz and Dr H. Ahmed                                                                                                                                                                                                                                                            |
| <i>Session V: Recommendations and closure</i>                               |                                                                                                                                                                                                                                                                                                                                                                                          |
| 13:15–13:45                                                                 | Review of the draft recommendations                                                                                                                                                                                                                                                                                                                                                      |
| 13:45                                                                       | Closing session                                                                                                                                                                                                                                                                                                                                                                          |

# List of participants

## Annex 2

### List of participants

#### AFGHANISTAN

Dr Ahmad Arif Stanikzai  
Acting National EPI Manager  
Ministry of Public Health  
**Kabul**

#### BAHRAIN

Dr Muna Sayed Jawad Al Musawi  
Chief, Diseases Control Section  
Public Health Directorate  
Ministry of Health  
**Manama**

#### EGYPT

Dr Ibrahim Kamal Barakat  
National EPI Manager  
Healthy Mother Healthy Child  
Ministry of Health and Population  
**Cairo**

Dr Ibrahim Fahmy Moussa  
Assistant EPI Manager  
Ministry of Health and Population  
**Cairo**

#### ISLAMIC REPUBLIC OF IRAN

Dr Abdoul-Reza Esteghamati  
EPI Manager  
Communicable Disease Control  
Ministry of Health and Medical Education  
**Teheran**

#### IRAQ

Dr Emad Ahmed Abdul Karim  
National EPI Manager  
Public Health and Primary Health Directorate  
Ministry of Health  
**Baghdad**

Dr Yosra Hafiz Al-Sammaroi  
National acute flaccid paralysis Surveillance Officer  
Department of Primary Health Care  
Ministry of Health  
**Baghdad**

Dr Hanaa Kadhum Hussan  
EPI Manager  
Diala Health Department  
Ministry of Health  
**Diala**

#### JORDAN

Dr Mohammad Ratib Surour  
Acting EPI Manager  
Ministry of Health  
**Amman**

#### LEBANON

Dr Mohammed Ali Kanaan  
Chief, Primary Health Care Department  
Ministry of Public Health  
**Beirut**

Dr Nada Ghosn  
Head, Epidemiological Surveillance Programme  
Ministry of Public Health  
**Beirut**

#### LIBYAN ARAB JAMAHIRIYA

Dr Mohammed Najeeb Smeo  
National EPI and Surveillance Coordinator  
National Center for Infectious Diseases Prevention and Control  
**Zetelen**

#### MOROCCO

Dr M'hammed Braikat  
National EPI Manager  
Directorate of Population  
Ministry of Health  
**Rabat**

#### OMAN

Dr Salah Thabit AlAwaidy  
Director, Department of Communicable Diseases Surveillance and Control  
Ministry of Health  
**Muscat**

#### PAKISTAN

Mr Qadir Bux Abbasi  
Technical Officer  
Federal EPI Cell  
National Institute of Health  
Federal Ministry of Health  
**Islamabad**

# Twenty-second meeting of national EPI managers

## **PALESTINE**

Dr Iyad Monir Arafah  
Director of Preventive Medicine Department  
Ministry of Health  
**Ramallah**

Mr Jehad Awad Ahmed  
EPI Manager  
Primary Health Care  
Ministry of Health  
**Gaza**

## **QATAR**

Dr Ibrahim Abdu Al-Shaar  
Director of Preventive Health Department  
National Health Authority  
**Doha**

Dr Syed Fazal Shah  
Head of Communicable Disease Control and Prevention  
National EPI Manager  
Department of Preventive Health  
National Health Authority  
**Doha**

## **SAUDI ARABIA**

Dr Abdelhafeez Muroof Turkistani  
Health Affairs Assistant/Manager of Public Health Care  
Ministry of Health  
**Mecca**

## **SOMALIA**

Dr Abdi Ismael Houssein  
Director of Communicable Disease Control and EPI Manager  
Ministry of Health and Labour  
**Hargeisa**

## **SUDAN**

Dr El Tayeb Ahmed El Sayed  
National EPI Manager  
Federal Ministry of Health  
**Khartoum**

## **SYRIAN ARAB REPUBLIC**

Dr Khaled Baradie  
National EPI Manager  
Ministry of Health  
**Damascus**

## **TUNISIA**

Dr Essia Ben Farhat Hmida  
National Immunization Programme  
Directorate of Public Health Care  
Ministry of Public Health  
**Tunis**

## **UNITED ARAB EMIRATES**

Dr Juma Bilal Fairouz  
Director, Disease Control Department  
Ministry of Health  
**Dubai**

## **YEMEN**

Dr Mohammed Ahmed Al-Imad  
EPI Manager  
Ministry of Public Health and Population  
**Sana'a**

Dr Ghada Showqi Al-Haboob  
Diseases Surveillance, EPI  
Ministry of Public Health and Population  
**Sana'a**

## **EPI Regional Technical Advisory Group**

Dr Mohamed Abaddi  
Chairman  
VACSERA  
Cairo  
EGYPT

Dr Seyed Alireza Marandi  
Professor of Paediatrics  
Shahid Beheshti University of Medical Sciences  
Teheran  
ISLAMIC REPUBLIC OF IRAN

Dr Jaouad Mahjour  
WHO Representative  
Beirut  
LEBANON

Dr Ali Jaffer Mohamed Suleiman (Chairman)  
Director-General of Health Affairs  
Ministry of Muscat  
Health  
OMAN

## List of participants

Professor Tariq Iqbal Bhutta  
Department of Paediatrics  
King Edward Medical College and Mayo Hospital Lahore  
Lahore  
PAKISTAN

Dr Khalifa Ahmed Al Jaber  
Assistant Under-Secretary for Technical Affairs  
National Health Authority  
Doha  
QATAR

Dr Hyam Bashour  
Chair, Department of Family and Community Medicine  
Faculty of Medicine  
Damascus University  
Damascus  
SYRIAN ARAB REPUBLIC

Dr Henda Triki  
Chief, Laboratory of Clinical Virology  
Pasteur Institute  
Tunis  
TUNISIA

Dr Hashim El Zein El-Mousaad  
WHO Representative, Yemen  
Sana'a  
REPUBLIC OF YEMEN

### Other Organizations

GlaxoSmithKline Biologicals  
Dr Magda Samir Tawfik Andrews  
Area Director Vaccines – Middle East and North Africa  
Dubai  
UNITED ARAB EMIRATES

Dr Hesham Mohamed Helmy Elkady  
Vaccine Sales and Marketing Manager – Middle East and North Africa  
Cairo  
EGYPT

**Health Ministers' Council for the Cooperation Council States**  
Dr Tawfik A.M. Khoja  
Director-General  
Riyadh  
SAUDI ARABIA

**Japan International Cooperation Agency (JICA)**  
Dr Wael Yahya  
Project Officer  
Cairo  
EGYPT

**Network for Education and Support in Immunization (NESI)**  
Ms Anke Lambin  
Project Manager  
Department of Epidemiology and Social Medicine  
University of Antwerpen  
Antwerpen  
BELGIUM

Dr Amr Abbassy  
Professor of Paediatrics  
Faculty of Medicine  
Alexandria University  
Alexandria  
EGYPT

Dr Najwa Khuri Bulos  
Professor and Division Head  
Paediatric Infectious Disease  
Director of the Infection Control Unit  
Jordan University Hospital  
Amman  
JORDAN

**United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA)**  
Dr Humaid Salem Abu Mousa  
Chief, Disease Prevention and Control  
UNRWA/HQ  
Amman  
JORDAN

**United States Naval Medical Research Unit No.3 (NAMRU-3)**  
Dr Rana Hajjeh  
Head, Disease Surveillance Programme  
Cairo  
EGYPT

# Twenty-second meeting of national EPI managers

## Observers

Dr Nagwa Abdel Tawab  
Injection Safety Manager  
Becton Dickinson  
Cairo  
EGYPT

Dr Shyam Bawikar  
Senior Epidemiologist  
Department of Communicable Disease Surveillance and Control  
Ministry of Health  
Muscat  
OMAN

Mr Salem Said Ahmed Al-Mahrooqi  
National Communicable Disease Supervisor  
Department of Communicable Disease Surveillance and Control  
Ministry of Health  
Muscat  
OMAN

Dr Salwa Seddik  
Chairman and CEO  
Egyptian Company for Production of Vaccines, Sera and Drugs  
Cairo  
EGYPT

Dr Heba Mahmoud Waly  
VACSERA  
Cairo  
EGYPT

## Meeting Secretariat

### UNICEF

Dr François Gasse, Senior Project Officer, Routine/Maternal and Neonatal Tetanus, UNICEF headquarters, New York

Dr Mahendra Sheth, Regional Health Adviser, UNICEF Middle East and North Africa Regional Office, Amman

Dr Francisco J. Blanco, Contracts Officer, New Vaccines, UNICEF Supply Office, Copenhagen

Dr Hemlal Sharma, Project Officer EPI, UNICEF Afghanistan

Dr Ghulam Haider Rafiqi, Technical Officer Health, UNICEF Afghanistan

Dr Magdy Latif El-Sanady, Health and Nutrition Programme Officer, UNICEF Egypt

Dr Essam Adel Allam, Assistant Project Officer, Health and Nutrition, UNICEF Egypt

Dr Alexander Malyavin, Senior Health and Nutrition Officer, UNICEF Iraq

Ms Bana Abdul Razzak Kaloti, MIS Project Officer – Health, UNICEF Palestine

Dr Mehoundo Faton, Project Officer Health EPI, UNICEF Sudan

Mr Jones Itombra Okoro, EPI Coordinator, UNICEF/Southern Sector (OLS), Lokichoggio

Dr Kamel Ben Abdallah, Health and Nutrition Officer, UNICEF Yemen

### WHO

Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean

Dr M.H. Wahdan, Special Adviser to the Regional Director for Poliomyelitis Eradication, WHO/EMRO

Dr Zuhair Hallaj, Director, Communicable Disease Control, WHO/EMRO

Dr Jean-Marie Okwo-Bele, Director, Immunization, Vaccines and Biologicals, WHO/HQ

Dr Jihane Tawilah, WHO Representative, Djibouti

Dr Said S. Youssouf, Regional Adviser, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Dr Ezeddine Mohsni, Medical Officer, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Dr Nadia Teleb, Scientist, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Dr Anne Golaz, Medical Officer, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Dr Faten Kamel, Medical Officer, Polio, WHO/EMRO

Dr Humayun Asghar, Virologist, Polio, WHO/EMRO

Dr Hala Safwat, Technical Officer, Polio, WHO/EMRO

Dr Abdalla Elkasabany, Polio, WHO/EMRO

Mr Jalaa AbdelWahab, Technical Officer, Polio, WHO/EMRO

Mr Patrick Lydon, Health Economist, Access to Technologies, WHO/HQ

## List of participants

Dr Oya Afsar, Medical Officer, Immunization, Vaccines and Biologicals, WHO/HQ

Dr Roland Sutter, Medical Officer, WHO/HQ  
Dr Claire-Lise Chagnat, Coordinator, Global Task Force and Cholera Centre, WHO/HQ

Dr Lara Jill Wolfson, Technical Officer, VAM/IVB, WHO/HQ

Mr Mojtaba Haghighi, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Dr Hinda Jama Ahmed, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Ms Sahar Mourad, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Dr Ghulam Farooq Mujadidi, National GAVI Immunization Adviser, WHO Afghanistan

Dr Tahir Mir, Poliomyelitis Eradication Programme, WHO Afghanistan

Dr Selma Khamassi, Medical Officer, WHO Djibouti

Dr Omer Mekki Ahmed, Medical Officer Polio, WHO Iraq

Dr Kamal Fouad Fahmy, Technical Adviser/VPDs, WHO Pakistan

Dr Irtaza Ahmad Chaudhri, National GAVI Immunization Advisor, WHO Pakistan

Dr Altaf Hussaim Bosan, GAVI HepB Immunization Advisor, WHO Pakistan

Dr Mohamed Azam, National Campaign Coordinator, WHO Pakistan

Dr Daher Daher Aden, Medical Officer, Primary Health Care PHC, WHO Somalia

Mr Mohamed Abdullahi Omar, SSA, EPI focal point for central and south, WHO Somalia

Dr Amani Abdelmoniem Mahmoud Mustafa, National GAVI Adviser, WHO Sudan

Dr Adam E. Zenaw, EPI/Measles Adviser, WHO South Sudan

Dr Mohamed Osama Mere, WHO Yemen

Dr Mohamed Hajar, National EPI Adviser, WHO Yemen

Ms Rabab Abdulsamie Zaineldin, WHO Temporary Adviser, WHO/EMRO

Mr Raef Bekhit, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Mrs Jehane Khadr, Senior Secretary, Division of Communicable Disease Control, WHO/EMRO

Ms Rasha Abdel Ghany, Senior Secretary, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Mrs Fatma Moussa, Senior Secretary, Polio, WHO/EMRO

Mr Adam Abou Bakr, Audio/Video Administrator, WHO/EMRO

Mr Ramy Ghanem, Help Desk Assistant, Information Systems Management, WHO/EMRO

Ms Sherine Farid, Secretary, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Ms Engy El Demerdash, Secretary, Vaccine Preventable Diseases and Immunization, WHO/EMRO

Ms Youmna Khalil, Secretary, Polio, WHO/EMRO

