



**EXPANDED PROGRAMME  
ON IMMUNIZATION**

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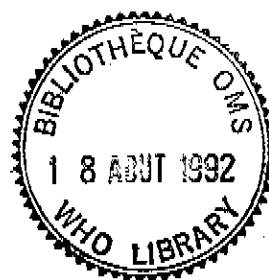
**REPORT OF THE 14TH  
GLOBAL ADVISORY GROUP**

**14 – 18 OCTOBER 1991**

**ANTALYA, TURKEY**



Expanded Programme on Immunization  
World Health Organization  
Geneva, Switzerland



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# I.

## INTRODUCTION

The Global Advisory Group of the Expanded Programme on Immunization (EPI) has 12 members representing all Regions of the World Health Organization (WHO) with six members selected "at large". Representatives of collaborating agencies and donors to the Programme are also invited and their views are included in this report.

The fourteenth meeting of the Global Advisory Group was held in Antalya, Turkey on 14–18 October 1991. The officers of the meeting were:

*Chairperson*

Dr A. Grech

*Vice-chairperson*

Dr Raj Karim

*Rapporteur*

Dr W. Orenstein

Dr A Grech welcomed six new members to the Group: Dr U. Aye Kyu, Professor A.S. Muller, Dr W. Orenstein, Mrs Vineeta Rai, Dr N. Sakai and Dr J. Sepulveda.

A short video from the UCI ceremony at the United Nations marking the achievement of 80% immunization coverage was shown.

Mr Saffet Arıkan Bedük, the Governor of Antalya appreciated the efforts of WHO and UNICEF in helping the immunization services in Turkey. He said that good health is an integral part

of national development and that we should be careful to take good care of women and children in particular. He said that training and the proper coordination of different agencies was the most important aspect of this work.

Dr G. Oblapenko, representing the European Regional Director of WHO said that Turkey was a bridge between the three continents of Europe, Asia and Africa and that the country is also a bridge of three different cultures. He concluded by saying that this meeting should be a bridge for the future of the children in the world.

Dr R. Kim-Farley, representing WHO Headquarters, said that the EPI had ambitious new goals to reduce measles mortality by 95%, eliminate neonatal tetanus by 1995 and to eradicate poliomyelitis by the year 2000. He went on to say that this meeting of the Global Advisory Group was the largest ever and that this demonstrated the commitment of the many organizations concerned.

Dr (Mrs) Gueler Bezirci, Deputy Under Secretary of Health, welcomed the members to Turkey and said that the children of the world owed a debt to the EPI for its success and she thanked the programme on behalf of the children of Turkey. She said that although immunization had started in Turkey in

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the 1930s the immunization rate had only reached about 30% by the mid 1980s. This led to three nation-wide campaigns in 1985 during which over 5 million children were immunized. Since that date, she reported that immunizations are being provided by routine

services, a polio eradication initiative had been launched and a neonatal tetanus elimination effort would be agreed next year. The country, she said, was searching for new ways to reach their twin goals of high immunization coverage and low disease incidence.

# 2.

## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

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### EPI for the 1990s

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The revised paper on "EPI for the 1990s" (WHO/EPI/GEN/92.2) was endorsed as the concept of the EPI for the decade. This paper should form the basis for developing a joint policy statement with UNICEF.

The revised progress report and proposed draft resolution for the WHO Executive Board were endorsed, specifically recommending the additional operational targets for the 1990s detailed below:

#### Surveillance

All countries should ensure complete and timely reporting of measles, neonatal tetanus and paralytic poliomyelitis (including reports of zero cases) on at least a monthly basis from all designated reporting sites by the end of 1992.

#### Immunization coverage

Immunization coverage against diphtheria, pertussis, tetanus, poliomyelitis, and tuberculosis for children under one year of age should reach at least 80% in all districts by 1995 and 90% by the year 2000. Measles immunization coverage should reach at least 90% in all districts by 1995. Meeting the goals of measles reduction, neonatal tetanus elimination and poliomyelitis eradication will require even higher

coverage in certain high risk areas. In all districts at high risk of neonatal tetanus, all births should be protected by the immunization of women of child-bearing age with tetanus toxoid by 1995. If risk is unknown, it should be assumed to be high.

#### New vaccines incorporated into the EPI

Yellow fever vaccine should be routinely administered to children under one year of age in all countries at risk for yellow fever by 1993.

Hepatitis B vaccine should be integrated into national immunization programmes in all countries with a hepatitis B carrier prevalence (HBsAg) of 8% or greater by 1995 and in all countries by 1997. Target groups and strategies may vary with the local epidemiology. When carrier prevalence is 2% or greater, the most effective strategy is incorporation into the routine infant immunization schedules. Countries with lower prevalence may consider immunization of all adolescents as an addition or alternative to infant immunization.

#### Establishment of a global fund for new vaccines

A global vaccine fund financed by the donor community should be established by 1993 to be used by developing

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countries to add hepatitis B and other new and improved vaccines to their immunization programmes. This fund should be a priority of the Children's Vaccine Initiative to ensure that these vaccines are available in the countries that need them the most.

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### **Cost and resource implications of EPI strategies**

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The measles reduction, neonatal tetanus elimination and poliomyelitis eradication initiatives and the new coverage goals will require significantly more resources, including more vaccine. Strategies to achieve these and other goals must be evaluated and prioritized using information that includes the cost implications and impact on available resources such as vaccines, staffing, equipment and budgets.

Additional efforts should be made to ensure that supplies of vaccines are increased and that adequate resources are available throughout the decade. This is likely to require enhanced vaccine production capacity.

Information on the resource needs of individual EPI strategies should be gathered through: (1) selected programme reviews; and (2) review of the effectiveness of strategies used by major countries to provide a measure of the trade-offs inherent in these different strategies.

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### **Donor participation and coordination**

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There is an expanding need for country, regional, and global resources

to sustain and support immunization in the 1990s. Because Interagency Coordinating Committees have resulted in enormous benefits in coordination and resource mobilization at country and regional levels, WHO should establish a means to assure a more effective participation and coordination of the donor community in the EPI at the global level.

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### **Achieving and sustaining 90% immunization coverage**

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The goal of achieving the 90% immunization coverage target for all antigens by the year 2000 is a critical objective of the EPI and must be seen as the basis for controlling all the EPI target diseases and to meet the measles reduction, neonatal tetanus elimination, and poliomyelitis eradication goals. This challenging goal will require additional resources as efforts focus on identifying and accessing high risk, difficult to reach, and under-served populations.

Since immunization services are an integral part of primary health care, maximum effort should be made to utilize immunization contacts to deliver other MCH services.

In their efforts to achieve or maintain high immunization coverage, countries should focus on areas and population groups with lower coverage. They should make more efficient use of available resources, increase self-reliance and improve the quality of services. Drop-out rates and missed opportunities need to be systematically reduced. The disease reduction, elimination, and eradication initiatives will be the main mechanism to sustain political visibility and goal orientation at both national

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and sub-national levels. The development of management information systems for national and local epidemiological surveillance should become a priority.

In those countries in which the health infrastructure is less developed or still deficient or which have low immunization performance (countries often affected by war, civil strife and economic hardships), highest priority should be given to extending the capacity to deliver vaccines throughout the country and initiating the development of surveillance and management information systems. After careful evaluation, in some of these countries, special eradication/elimination activities may be undertaken if it is determined they are likely to hasten the strengthening of the immunization infrastructure (e.g., if such activities can help mobilize the resources to enhance the overall immunization programme). Extensive support from the international community is urgently needed to help these countries reach all communities and attain high coverage as well as to proceed vigorously toward disease reduction, elimination, and eradication targets. Immunization initiatives should be used for promoting "days of tranquility" in countries affected by war and civil strife.

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### Neonatal tetanus elimination

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The 1990 Global Advisory Group recommendations to eliminate neonatal tetanus by 1995 are reemphasized and countries are urged to:

- identify *high risk areas* and population groups;

- prepare Action Plans which identify and prioritize efforts to high risk areas; and
- screen and immunize every woman who brings a child to an immunization session.

A mother of a child diagnosed with neonatal tetanus appears to be at significantly higher risk of having subsequent children with neonatal tetanus. Health staff should screen and immunize mothers of children who present with neonatal tetanus.

To obtain more accurate information on neonatal tetanus protection, the following should be considered:

- at least one coverage survey with sub-national stratification in all countries at high risk to measure the proportion of infants protected at birth from neonatal tetanus. This survey should also collect information on basic indicators of maternal care.
- field evaluation of the validity and operational feasibility of routinely monitoring tetanus toxoid protection levels of mothers at the first DPT contact with their child (see Prevention of Neonatal Tetanus through Immunization, WHO/EPI/GEN/86/9 REV 1 for definitions of protection). WHO should report on the results of these evaluations at the 1992 GAG meeting.

Progress on screening and immunizing women bringing a child to immunization sessions, as well as offering tetanus toxoid at first contact with antenatal care, should be assessed at every supervisory visit and programme review.

Safe and clean delivery by trained birth attendants is one element of the

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Safe Motherhood Initiative and is a core component of the neonatal tetanus elimination initiative. Progress toward implementing this strategy should be monitored utilizing rates of maternal mortality, investigation of maternal deaths, provision of antenatal care, and the use of clean delivery kits.

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## Measles reduction

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The Global Plan of Action for Measles Control (WHO/EPI/GEN/92.3) is endorsed.

Immunization programmes should strive to meet the measles reduction goals. WHO should aggressively promote research to overcome barriers to these goals, including:

- the absence of vaccines that induce high efficacy in infants during the first few months of life;
- the high (approximately 85%) but potentially insufficient efficacy of a single dose of presently available vaccines when administered at 6 or 9 months of age;
- the high proportion of cases not seen by the health care system making complete case ascertainment difficult;
- the absence of simple diagnostic tests for use in the field to differentiate measles from other rash illnesses with similar characteristics; and
- the absence of a clearly defined strategy to reach the goals.

Control strategies, including outbreak control strategies, should be tested and evaluated during the next year in several countries or sub-regions and progress reported at the next meeting.

Alternate strategies should be studied for cost-effectiveness and feasibility. Strategies for improving coverage in urban areas should receive a high priority.

Studies should be completed rapidly to assess the efficacy and safety of administering measles vaccines to children younger than 9 months of age and/or in 2 dose schedules.

Eradication strategies should be evaluated as soon as possible. Progress on the innovative efforts in the Americas to eradicate measles will be of particular interest.

Vaccine requirements for control activities must be determined and supplies guaranteed. Global demand will rapidly increase substantially beyond current levels. Adequate resources must be secured to ensure the success of the initiative.

Countries should produce or review guidelines for health workers on the treatment of measles. Vitamin A should be used for treatment of measles in areas where vitamin A deficiency is a public health problem and should be considered for severe cases in other areas as well.

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## Poliomyelitis eradication

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Unless additional financial and technical support becomes available immediately for national, regional and global polio eradication activities, especially for vaccine supply and laboratory network support, there may be ultimate failure of the poliomyelitis eradication initiative. Donors should be made fully aware of this severe constraint

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and be urged, on a multilateral or bilateral basis, to ensure sufficient financial and technical support to allow national immunization programmes to complete poliomyelitis eradication.

The technical policies recommended at the 1990 Global Advisory Group meeting remain the basis for poliomyelitis eradication. After further experience gained in the last year, these policies are reaffirmed.

Because the global goal for poliomyelitis eradication is not targeted to be achieved until the year 2000, there is concern that countries may have a false sense of security that they can delay taking measures to begin eradicating polio until the latter part of the decade. Global eradication will be enhanced if all countries implement necessary actions for poliomyelitis eradication as soon as practicable to assure the goal is achieved at the earliest possible time. WHO should develop a plan of action for eradication certification and evaluate the possibility of global certification by the year 2000.

Countries which have developed national plans of action aimed at achieving eradication of the wild poliovirus should review these plans to ensure that technically appropriate policies as recommended by WHO, especially on immunization and surveillance, are being implemented and that progress is being monitored on a regular basis.

WHO should review the lessons learned from poliomyelitis eradication in the Americas and other countries as well as their implications for EPI and primary health care.

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## Control of Pertussis

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Available data indicate that pertussis continues to be an important disease during infancy and childhood, particularly among those who are inadequately immunized.

All countries should use available pertussis vaccines in immunization programmes for children. Since acellular pertussis vaccines are not yet generally available, the widespread use of DPT vaccine containing the whole cell pertussis component should be continued. The risk of pertussis disease far outweighs the risk of severe reactions to the vaccine.

Surveillance of pertussis morbidity should be strengthened in all countries and, ideally, pertussis should be a reportable disease. There is a need to collect more information on the present epidemiological pattern of pertussis, especially the age distribution of pertussis cases in developing countries, to have the data on which to base recommendations regarding a DPT booster dose policy in children above one year of age.

Routine monitoring of vaccine efficacy is highly desirable. Epidemiological data on a low vaccine efficacy should be considered a danger signal for possible low quality vaccine or inadequacies of storage, transport or administration of vaccine. Such possibilities should be investigated.

Previous recommendations for DPT immunization at 6, 10 and 14 weeks of age in developing countries are reaffirmed.

In developed countries, any recommended schedule should include a three dose primary series of DPT vaccine administered before 6 months of age. Reinforcing the primary series with a fourth dose given at 15 to 24 months of age should be considered. The need for additional booster doses at later ages should be assessed by individual national programmes. The coverage target for the one booster dose should be the same as for the primary series.

WHO should review the available information on the need for supplemental doses of all EPI vaccines, including DPT, and should propose recommended policies on such doses at the next meeting.

WHO should encourage the development of better diagnostic tests which would facilitate surveillance of pertussis.

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## Hepatitis B

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Previous recommendations for hepatitis B are reaffirmed. Target dates for implementation have been set. The call for action contained in the Yaounde Declaration on the Elimination of Hepatitis B Infection (Annex D) is endorsed.

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## Rubella and congenital rubella syndrome

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While much is known about rubella and congenital rubella syndrome (CRS) in the developed world, there are insufficient data from developing countries on:

- the epidemiology of rubella;
- rubella infection during pregnancy;

- the incidence of CRS; and
- the health impact of the above.

This last point is crucial to determine whether there is even a place for rubella control in such countries.

A strategy to interrupt transmission of rubella virus through high coverage with rubella vaccine at the same time as measles vaccine has potential risks. If coverage is not sufficient to interrupt transmission but merely shifts the age-specific infection rate to older groups, then the potential exists for more cases of CRS than would have occurred in the absence of vaccination.

Strategies of selective vaccination of prepubertal schoolgirls and susceptible adult women, although not associated with the above risks, may be harder to implement because of difficulties in accessing target populations and are relatively inefficient as many of those to be immunized are already immune.

Introduction of MMR or rubella vaccines in any immunization programme should be within a strategy that aims primarily at the prevention of CRS. Therefore, universal immunization with MMR should be avoided in developing countries unless very high coverage can be assured and immunization of post-pubertal females is simultaneously introduced. The preferred strategy for those countries wishing to embark on a rubella control program is selective immunization particularly of high risk groups, essentially post-pubertal females.

WHO should promote research to determine the epidemiology of rubella and CRS and the health burden of these conditions in developing countries. This

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would allow rational decisions to be made on whether and how to undertake control. WHO should develop protocols including standardized epidemiologic and laboratory methodologies to allow studies to be compared directly. With such information, mathematical modelling evaluating the impact of various strategies should be feasible.

WHO should develop specific guidelines to assist countries considering the introduction of rubella control strategies. In developing these guidelines, WHO should draw on the experiences of those developed and developing countries who have started and evaluated rubella control.

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### **Routine systems for disease surveillance**

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A critical determinant of the success of immunization programmes will be the impact of high coverage on disease incidence. As well as measuring programme impact, disease surveillance in every country will be essential to help identify risk areas and to produce information which can form the basis for appropriate immunization policies. As rudimentary surveillance systems are improved, increases in reported cases should be expected in many countries even when coverage may already be high. Enhanced reporting should be encouraged and reporting sites should receive positive reinforcement and should not be punished for improving disease notification.

Effective surveillance systems should urgently be established to proceed with the measles reduction, neonatal tetanus

elimination and poliomyelitis eradication initiatives. Systems should be in place by the end of 1992 to reach a 1995 goal. Implementing surveillance for these diseases should serve as an impetus to improve overall disease surveillance.

The "Guidelines for Improvement of Routine Systems for Disease Surveillance, Including EPI Target Diseases" (WHO/EPI/GEN/92.4) are endorsed. Of special note are: the importance of decentralizing the responsibility for disease surveillance; the analysis of surveillance information for developing and enhancing disease control policies; and the importance of using indicators to monitor and improve the quality of surveillance. The involvement of the community, local leaders, NGOs and private physicians in the surveillance system should be sought to strengthen political resolve and mobilize the community to reach the goals.

Training in disease surveillance should be based on the above guidelines. WHO should organize and conduct inter-country and country workshops on disease surveillance with highest priority given to training of trainers.

Laboratory support will be essential for achieving the goals of polio and measles eradication. Efforts should be continued to develop a laboratory support system. However, substantial improvements in surveillance systems should be made even prior to the availability of this laboratory support.

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### **Vaccine quality**

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The GAG is alarmed that much of the vaccine in use today either does not

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comply with WHO requirements or is of unknown quality. This is despite the fact that the World Health Assembly in 1982 adopted Resolution WHA35.31 which urged Member States to assure that all vaccines used in immunization programmes meet WHO requirements. For example, only 25% of tetanus toxoid producers and 47% of OPV producers have independent control authorities determined by WHO to be acceptably certifying compliance with WHO requirements.

The rapid implementation of the principles of the Certification Scheme for Pharmaceutical Products Moving in International Commerce, contained in World Health Assembly Resolution WHA41.18, is encouraged for all EPI vaccines, with OPV and tetanus toxoid as a first priority.

The proposed draft resolution on vaccine quality being prepared for the WHO Executive Board in a form which will include all EPI vaccines is endorsed.

Member States and the international community should urgently review the status of all vaccines used in the EPI to assess whether they meet WHO requirements; identify the resources necessary to conduct this review; continue monitoring vaccine quality on an ongoing basis; and upgrade production facilities and National Control Authorities to ensure that vaccines meet WHO requirements.

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### **Micronutrient supplementation through the EPI**

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Urgent priority should be given to micronutrient supplementation in areas

of recognized deficiency. Those responsible for nutrition should take the lead on overall policy, with EPI as one of the programmes responsible for the delivery of supplements to infants, young children and mothers.

Operational targets should be set at country and regional levels. In the initial stages of programme development, such targets will relate to the coverage of micronutrients.

Previous GAG recommendations for schedules of vitamin A and iodine supplementation supplied through immunization programmes are reaffirmed. Further review will be necessary as soon as the result of trials on both impact and safety of vitamin A supplementation in the early months of life are available.

Iron supplements should be delivered to pregnant and lactating women through immunization programmes in areas of recognized deficiency. Tetanus toxoid administration during pregnancy provides an opportunity to supply iron supplements.

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### **Cold chain and logistics for health**

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The wastage of vaccine from 20 dose vials observed in recent field studies where immunization sessions are less than 10 children is cause for concern. Refusal to open vials of vaccine has also been found to contribute to missed immunization opportunities. Countries are therefore urged to conduct studies, if needed, on the average number of children and women immunized per session to determine which vial sizes to

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order (e.g., 5 or 10 dose vials instead of 20 dose vials).

Indicators of heat exposure suitable for vaccine vials have been developed and are in the latest UNICEF tender for polio vaccine. All major international suppliers should use these indicators with polio vaccine, the most heat labile vaccine of the EPI, and expand to cover other EPI vaccines.

Solar powered refrigeration has been shown, by surveys in the Americas, Africa and the Western Pacific to perform reliably when installation and maintenance procedures have been followed according to WHO standards. Work should continue to reduce system costs and broaden the benefits of solar energy to other sectors of primary health care.

Reusable syringes and steam sterilizers remain the equipment of first choice. In countries using disposable equipment, auto-destruct syringes should be used unless it can be assured that disposable syringes and needles will be safely destroyed after a single use. The group commended UNICEF for supplying only auto-destruct syringes instead of standard disposable syringes for use in the EPI.

The quality of steam sterilization should be routinely monitored by the

use of accepted time, steam, and temperature indicators.

Countries are encouraged to allow sterilization and other equipment supplied for the EPI to be used by other primary health care programmes.

Measures should continue to be undertaken to improve cold chain equipment and assure its maintenance.

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## Vaccine Independence Initiative

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The Vaccine Independence Initiative is endorsed. This Initiative promotes the sustainability of national immunization programmes by aiding certain countries to ensure the long term supply of WHO approved vaccines through the provision of flexible financing terms, emphasis on strong planning and inter-ministry cooperation and an efficient vaccine procurement system.

UNICEF and WHO should rapidly expand this mechanism to all countries which could benefit from its use and their country offices are encouraged to accept local currency generated by the Vaccine Independence Initiative wherever possible.

# 3.

## REGIONAL AND GLOBAL PROGRESS

### African Region

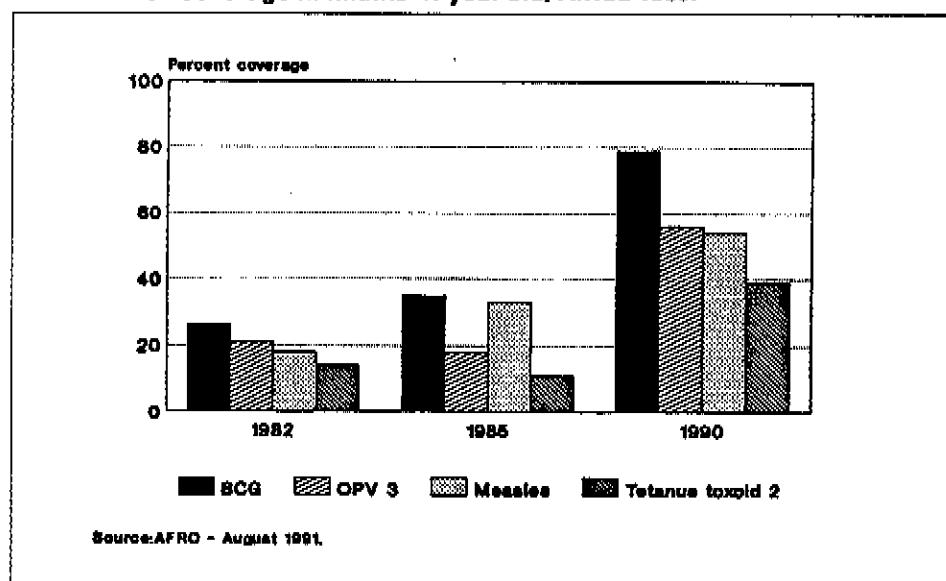
The Expanded Programme on Immunization has been progressing well over the last year in the African Region. There continues to be strong support from the top levels of all Ministries of Health.

The 41st Session of the African Regional Committee was attended by more than thirty Ministers of Health and other country delegates and discussed extensively the achievements and challenges of national immunization programmes. It was noted that the implementation of the EPI at the national level had clearly demonstrated the tremendous potential of health systems, including the managerial and

professional abilities of peripheral health workers, regional supervisors and national programme directors, once appropriate planning, training, supplies and supervision are provided.

Regional targets include the requirement that immunization services should be accessible to all infants, and coverage levels should be at least 75% in all countries for all six EPI vaccines by 1990. It is clear that Member States are making special efforts to achieve these targets. As of August 1991, the achievements include an immunization coverage of 79% for BCG, 57% for the third dose of DPT, 56% for the third dose of OPV, 54% for measles and 39% for the second dose of tetanus toxoid.

**Figure 1**  
Immunization coverage in infants <1 year old, Africa 1990.



Twenty out of forty countries, representing one third of the Regional population, have sustained a high coverage throughout the acceleration period which started with the African Immunization Year in 1986. These are mainly countries where immunization services are integrated within PHC activities and there is a good health infrastructure.

Regional surveillance remains limited for monitoring trends in disease incidence. Reporting remains incomplete, irregular and unreliable. A major effort will be needed in 1992 to rectify this situation, especially at country level. There is also a need to extend the proportion of health facilities reporting as well as making sure that reports are timely and regular. Immunization coverage is not yet reported well, and it is becoming increasingly necessary to consider setting targets for reporting completeness and timeliness for national programmes.

The installation of the Computerized EPI Information System (CEIS) has been actively promoted by WHO in the Region for the past three years. Some countries, however, have problems in maintaining the system. In some cases, the person responsible at the national level has not been adequately trained or did not have training in computers at the time of installation. It appears that a more in-depth evaluation is needed before there is further expansion of the CEIS in the Region.

There will need to be more emphasis in training materials to improve technical and managerial performance at the district level. District Health Teams are expected to develop a list of EPI priority

actions and resources needed to expand immunization activities.

The main concerns of EPI in the Region include the following:

- identification of the most appropriate strategies for service delivery that will sustain the present achievements and ensure improvement – especially in countries with low coverage. So far, the district approach for planning and monitoring EPI seems very relevant for most national health systems in the region.
- ensuring a continuous community participation and involvement in the disease control goals through the successful implementation of the Bamako Initiative (which aims at strengthening PHC delivery with full commitment of the country concerned).
- coordinating resources and efforts of many donor agencies at regional and national levels.
- problem-solving follow-up visits by inter-agency teams, subsequent to the preparation of EPI plans of operations by all countries.

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## American Region

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### Immunization Coverage

As in previous years, coverage continued to increase during 1990-91, and for the first time in history, coverage was above 75% for all the vaccines included in the childhood part of the programme: DPT, OPV, measles and BCG.

The increase in coverage over the last ten years – from as low as 15% for DPT

vaccine in 1979 to 76% achieved in 1990 – is in itself a major public health success story that demonstrates when there is a clear public health objective, sound programme strategies, and the political will and resources, the target can be achieved.

Coverage with the first dose of multiple-dose vaccines such as DPT and OPV is above 90%, and declines to just above 75% for the third dose are due to drop-out from first to last dose. Using this criterion, it can be assumed that the goal of the availability of immunization services to all children has been achieved. The combination of several immunization tactics, such as delivery of vaccines through all health facilities and the utilization of national or district immunization days with all EPI vaccines, has assured that these services are available to all of the population.

### Poliomyelitis eradication in the Americas

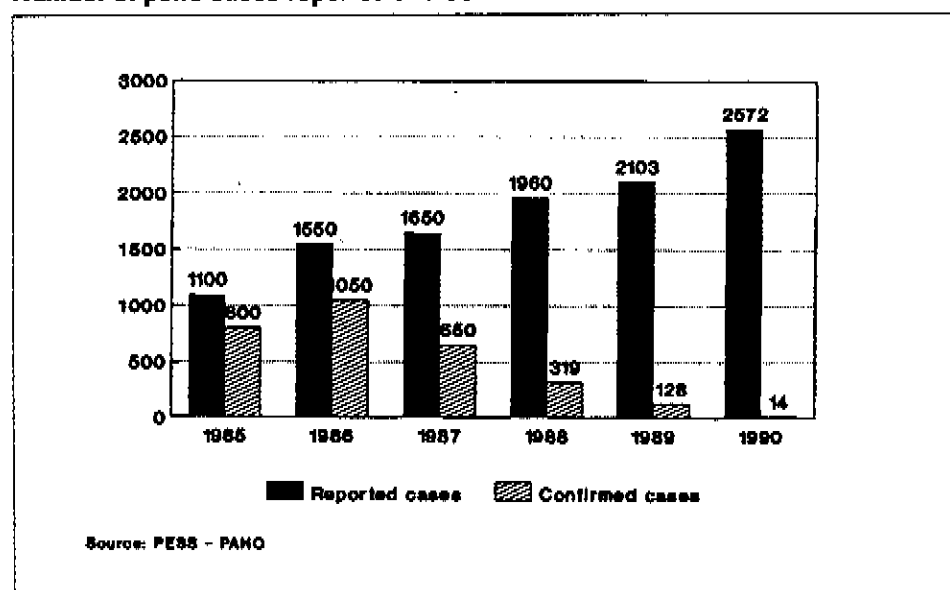
Poliovirus transmission appears on the verge of being interrupted through-

out the Western Hemisphere. Despite examination of over 2,000 stool specimens during 1990, only 18 have revealed wild poliovirus. Over four years have elapsed since the last isolation of wild poliovirus in the Southern Cone countries, more than eight years since an isolate has been found in the English speaking Caribbean, more than three years since the last isolation of indigenous wild poliovirus in Central America (the last three isolates appear to have originated from a recent introduction from Mexico), two and a half years since the last one in Brazil, and eleven months since the last one in Mexico.

The significance of these findings is even more remarkable considering the enormous improvement in surveillance for acute flaccid paralysis during the last year. In all, 2,572 reports were investigated, the largest number investigated to date in a single year.

By October 1991, only seven polio cases have been detected, six in Columbia and one in Peru. The last case

**Figure 2**  
Number of polio cases reported and confirmed in the Americas 1985 – 1990.



reported to date was in Columbia on 16 April 1991. This tremendous progress can be attributed in substantial measure to the political and social commitment which has generated a high priority for immunization programmes in all countries of the Americas and within PAHO. In addition, the combination of strategies so effectively used with national immunization days, and mopping up operations complementing immunization activities carried out daily at health facilities, is having a great impact toward increasing immunization coverage. The high level of coordination achieved among all the governments and agencies that are supporting immunization efforts in the Western Hemisphere (USAID, UNICEF, Rotary, IDB, CPHA and PAHO) is also critical for smooth and creative implementation of the programme and for optimal use of available resources.

The use of immunization coverage data by district, and the improvements in surveillance of acute flaccid paralysis make clear the benefits that could be accrued to other elements of the overall immunization programme, and potentially other primary health care interventions by this decentralized information system.

#### **Neonatal tetanus elimination in the Americas**

In the period 1985 to 1990, there were between 1 000 to 1 400 cases of neonatal tetanus reported annually in the Americas. The 1990 data are still provisional and surveillance for neonatal tetanus is not yet fully developed, but preliminary information from studies that took place over the last three years

indicate that as many as 10,000 cases of this disease could be occurring every year in the Region of the Americas.

The PAHO approach to eliminate this disease by 1995 is to immunize all women of childbearing age in all those areas that are identified as high risk for the disease. This strategy is based on the prevalence of the disease which varies in the different geographical areas within a country. Surveillance should also be established to determine the magnitude of the problem in those areas that do not report cases and to evaluate the impact of the immunization programmes in those areas targeted for action. The immunization activities are a complement to the improvement of prenatal care and of delivery practices used both in formal as well as informal health services, including the participation of traditional birth attendants in immunization and surveillance activities.

The studies conducted so far have identified that 57% of the cases of neonatal tetanus in the Americas occurred in only 5% of the total number of districts or counties, where there are only 10 million of the total 86 million women of childbearing age that reside in these 16 countries.

Thus, the immunization of just 10 million women of childbearing age could prevent over half of the cases of neonatal tetanus that are known to occur in the Americas during any given year.

Several countries have started control measures in these high risk areas and preliminary information indicates that control of the disease could be achieved effectively.

**Figure 3**  
**Incidence of NNT and cumulative coverage TT 2 in women 15 – 45 in urban Santa Cruz 1987 – 1990.**

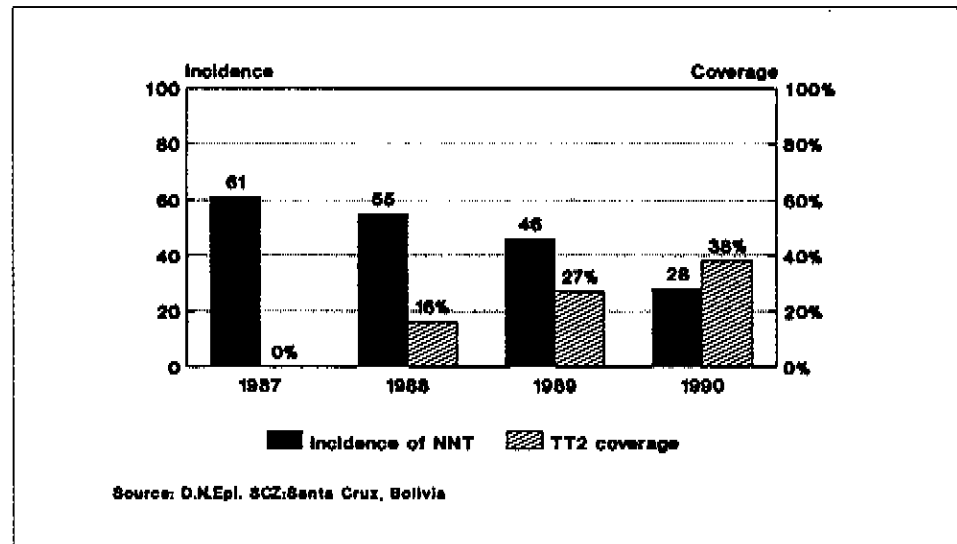


Figure three shows the decline in neonatal tetanus cases in Santa Cruz de la Sierra, Bolivia, following the introduction of immunization of women of childbearing age, with the participation of traditional birth attendants in the process of immunization.

#### Measles control in the Americas

Information on measles incidence at national and regional level is frequently incomplete and does not represent the true epidemiological situation. However, even with these deficiencies it is possible to analyze the trends of the disease and establish the best strategies for its control.

It is important to stress that the strategies for measles control rely on two components:

- in those countries where the infrastructure is not well developed, achieving and maintaining high

immunization levels will have to be accomplished by intensive immunization through existing health services, complemented by national immunization campaigns; and

- intensive epidemiological surveillance to detect all suspected cases and the institution of appropriate control measures.

Using these strategies, Cuba has reported no case of measles since September 1990 and the English-speaking Caribbean initiated its measles elimination activities in May 1991 with the immunization of all children under 15 years of age, coupled with intensive surveillance activities. The experiences of Cuba and the English-speaking Caribbean will show the way for the strategies that will eventually be used for the elimination of measles from the Americas.

## Conclusions

The 25th meeting of the PAHO Directing Council WHO Regional Committee for the Americas met in September 1991, and approved a Resolution that established priorities for action for the 1990s. Among these, it is of critical importance that there is decentralization of the health services with identification of areas at highest risk for resource allocation, as well as the inclusion of the private sector in further support of the programme.

The surveillance infrastructure developed for polio eradication is now being expanded to include fever and rash disease as well as for early recognition of cholera epidemics in many countries of the Region.

The Council requested that the Organization evaluate the strategies for measles control and elimination and the feasibility of eliminating this disease in the Americas. It was felt that the issue of vaccine supply should also be looked at with the goal of achieving regional self-sufficiency in matters of vaccine production and quality control.

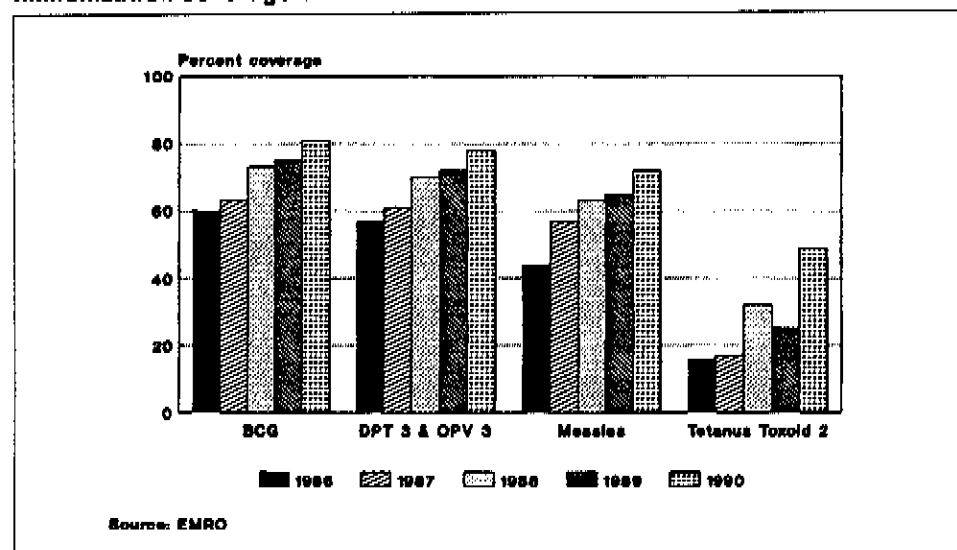
## Eastern Mediterranean Region

### Immunization coverage.

For 1990, reported regional immunization coverage among infants before their first birthday was 86% for BCG, 81% for DPT3 and OPV3 and 75% for measles. The reported immunization coverage with at least two doses of tetanus toxoid was 52% for pregnant women and 20% for women of child bearing age. In three Member States, Afghanistan, Somalia and the Southern Provinces of Sudan, coverage remains low due to local conflicts.

19 of the 22 countries in the Region, and the Palestinian People under the administrative care of UNRWA, reported achieving DPT3/OPV3 coverage well over 80% in 1990. This area has over 85% of the Region's infant population. 19 countries have also reached 70% coverage for measles vaccine. Three countries, Afghanistan, Lebanon and Somalia, have not yet achieved 50% coverage for measles vaccine.

Figure 4  
Immunization coverage of children <1 in Eastern Mediterranean 1986 - 1990.



All countries adopting tetanus toxoid immunization as a routine, are now targeting women of child bearing age, with emphasis on pregnant women.

Data analysis from the Region shows that over 85% of infants received at least one DPT/OPV dose in 1990, ranging from 31% in Somalia to 99% in Bahrain. Drop-out rates were less than 5% from first to third dose with a range of 1% in Cyprus to 24% in Afghanistan.

Six countries, Egypt, Jordan, Lebanon, Saudi Arabia, Tunisia and the United Arab Emirates, conducted evaluations and four more countries were independently reviewed by WHO and UNICEF in 1990 to validate their routine reporting system.

#### Sustainability of Immunization

The recent Intercountry Meeting of EPI Managers, endorsed by the Regional Technical Advisory Group, made three recommendations to ensure the sustainability of immunization in the Region:

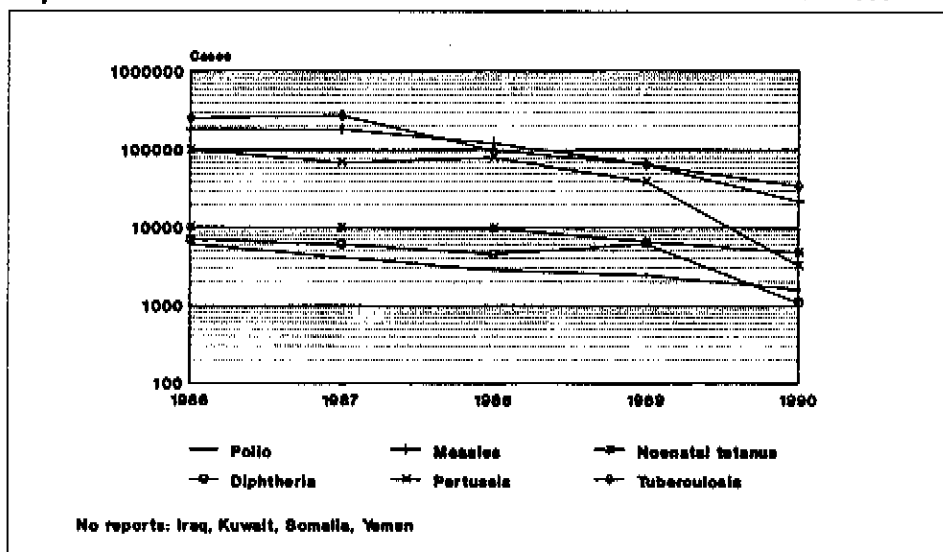
- the international and bilateral agencies should maintain support for countries requiring it in a way that will lead to self sufficiency,
- inter-country assistance within the Region should be strengthened, especially in the area of information and technical support. Countries with greater financial support should consider assisting neighbours with more limited financial resources,
- Advocacy to political leaders should be maintained, with increasing focus on disease reduction.

#### Disease surveillance

Available data indicate a consistent and demonstrable decline in reported morbidity from the EPI target diseases over the past 5 years. Other positive trends include recording longer inter-epidemic cycles, and a shift towards an older age group.

In spite of these trends, data on disease incidence remains the weakest component of the programme information system. However, it is estimated

**Figure 5**  
Reported annual incidence of EPI diseases in E Mediterranean 1986 - 1990.



that, by December 1990, immunization in the Region prevented some 306,000 deaths from measles, neonatal tetanus and pertussis among infants and 57,000 cases of poliomyelitis. The same estimates indicate that 174,000 deaths from these diseases are still occurring, along with 17,000 cases of poliomyelitis.

A polio laboratory network plan is now ready to be implemented, with 4 Regional Reference Laboratories (Egypt, Kuwait, Pakistan and Tunisia) and 6 National Reference Laboratories, (Iran, Iraq, Jordan, Morocco, Saudi Arabia and Sudan).

Following 3 sub-Regional workshops, all Member States where neonatal tetanus remains a problem have developed comprehensive national plans of action to eliminate the disease, within the overall framework of EPI and MCH.

National and sub-regional workshops on epidemiological surveillance have been held in Egypt, Pakistan and for the Mahgreb countries. Further intercountry workshops are planned for Jordan and Bahrain.

#### **Additional vaccines and interventions**

In response to Resolution RC36/R.3 of the Regional Committee adopting the Regional Plan of Action for the control of Hepatitis B, three demonstration areas in Iran, Pakistan and Syria, have investigated the best methods for operational integration of hepatitis B vaccine (HBV) into routine immunization services. Seventeen countries of the Region have introduced or plan to introduce HBV as a routine vaccine, following WHO recommended schedules.

In Pakistan and Iran, the EPI has taken active steps to promote the use of Vitamin A and iodine supplementation through the contacts afforded by immunization.

#### **EPI advisory systems in the Region**

The Terms of Reference of the Technical Advisory Group have been enlarged to cover all aspects of EPI.

In October 1991 the 38th Regional Committee endorsed a recommendation to create an Inter-agency Collaborative Committee aimed at raising political commitment and to obtain National and International support to achieve the goals endorsed by the World Summit for Children. The Regional Office for the Eastern Mediterranean is seeking to establish similar committees in Member States where health service development depends on external financial and technical support.

#### **Constraints**

Six major constraints, likely to limit the achievements of EPI, have been identified:

- inaccessibility to children living in areas of conflict;
- missed opportunities for immunization;
- weak health information and epidemiological surveillance systems;
- excessive centralization;
- shortage of efficient laboratory facilities, in areas of vaccine quality assurance and poliovirus isolation; and
- great shortage of funds for Regional, inter-country and national activities.

## European Region

### Situation analysis

Data provided by Member States show that, for diphtheria and tetanus vaccines in children, 18 countries have achieved coverage over 90%, 6 have levels of 80-90% but 5 countries have low levels, where further immunization is required if the risk of disease is to be minimized.

Reports indicate that 50% of European countries no longer use BCG in their immunization schedules.

For pertussis vaccine, there is a wide variation in coverage between countries. In 2 countries, coverage is zero or very low, while in a further 5 countries, it is below 80%.

13 countries in Europe have already reached 90-95% coverage for measles vaccine, while 9 others are close to this level. In general, progress in raising measles or MMR coverage has proceeded well in the majority of countries.

With polio vaccines, 21 countries have reached the Regional targets, and only 3 have coverage lower than 80%. In 8 countries, coverage levels have increased over the past 3 years, but in 3 countries coverage levels have declined.

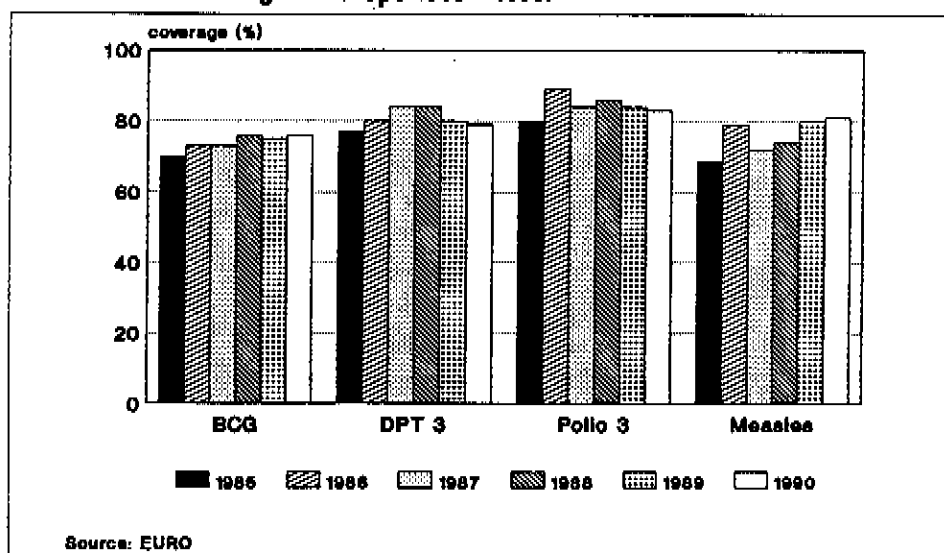
Data on immunization coverage need careful interpretation in the European Region, where it may be influenced by different methods of calculation, by differences in the frequency of assessment and by under-reporting from the private sector.

### Poliomyelitis eradication in Europe

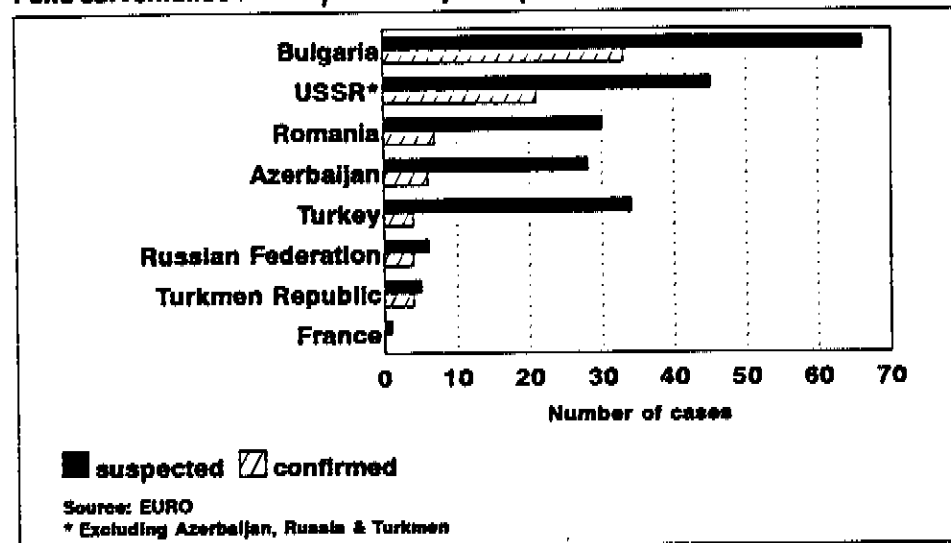
During 1984-88, the reported morbidity from acute polio in the Region was 200-300 cases a year. In 1990, this figure increased to 369 cases, with 337 from the USSR and 21 from Turkey. Five countries reported 14 vaccine-associated cases and there were 2 documented importations into Germany.

Up to 31 August 1991, 104 cases have been reported, with 50 from the

Figure 6  
Immunization coverage in Europe 1985 - 1990.



**Figure 7**  
**Polio surveillance in Europe January to September 1991. 79 confirmed cases.**



USSR, especially from Azerbaijan, Turkmenia, Uzbekistan, the Russian Federation and Tajikistan, which reported an outbreak in July of this year. Bulgaria reported an outbreak of 42 cases, mostly among a minority group, Romania seven cases, Turkey four confirmed cases and Yugoslavia one case.

During the period 1988-1991, 10 countries have reported indigenous cases and this reporting confirms the existence of low level endemicity in the Balkan States of Bulgaria, Romania and Yugoslavia and persisting endemic transmission in the USSR and Turkey.

The WHO Regional Office is in the final stages of developing a Plan of Action for the Regional Polio Laboratory Network. Data collected as the basis for this planning show that 43 laboratories are involved in polio eradication, 26 countries are routinely performing diagnostic virology, with 17 conducting intratypic differentiation.

12 Laboratories are conducting research into surveillance for wild polioviruses in sewage and 11 are monitoring poliovirus circulation in water supplies.

During 1991, the National Institute of Public Health, Helsinki, Finland hosted a workshop on the environmental surveillance for wild poliovirus circulation in Europe.

#### Neonatal tetanus elimination in Europe

This disease is not yet uniformly reported and several Member States do not separately report neonatal and non-neonatal tetanus. 5 countries regularly reported new cases of neonatal tetanus during the period 1980-90. Turkey reported 67 cases in 1990.

The proportion of the population in Europe considered free from the disease increased slowly from 86% in 1974 to 90% in 1989.

### **Diphtheria control in Europe**

During 1985 to 1989, a rapid decline in reported cases of diphtheria was recorded, but this was sharply reversed in 1990 reflecting a major outbreak in the USSR, when 1 731 cases and 65 deaths were reported. The authorities, supported by WHO, believe the responsible factors include low immunization coverage with DPT/DT, an immunity gap in adults and the adverse attitudes among health staff and the public towards immunization.

### **Measles reduction in Europe**

The morbidity from measles has declined in recent years, but coverage levels are still far from those required to eventually achieve eradication.

Several major outbreaks have been observed in the past three years, affecting also countries with very high immunization coverage. In these epidemics, the outbreaks were generally smaller and affected a different age-group from those previously infected.

It is becoming apparent that, in the European Region, a one dose strategy may not be sufficient to eliminate measles.

### **Elimination of congenital rubella syndrome in Europe**

The morbidity of rubella has been declining since 1985-86 and subsequently, the highest incidence has been observed in countries with no programme of rubella immunization.

Congenital rubella syndrome is not notifiable in 13 countries.

While a few countries have reached the Regional target, much more needs

to be accomplished before the full regional impact is achieved. The first priority will have to be to assist certain countries to introduce MMR or rubella vaccines into their schedules.

### **Pertussis control in Europe**

The incidence of pertussis has stabilized during the last four years at 107,000-120,000 cases per year.

### **Improving Surveillance**

In general, surveillance systems in the European Region are based on passive reporting of cases.

12 countries publish epidemiological bulletins on a weekly basis and 14 on a monthly basis.

In recent years, EPI disease surveillance has been established in many European countries.

Many problems remain, e.g. measles is not notifiable in four countries, neonatal tetanus in three, polio reporting is frequently delayed, specimens from suspect polio cases are not always collected and immunization coverage is often not monitored by district.

The Regional Office has made a special effort to improve surveillance and some promising changes have already taken place:

- the number of countries regularly reporting immunization coverage has increased,
- active surveillance for acute flaccid paralysis has started in the UK in a model system,
- zero polio reporting has started,
- countries are collecting information on suspected polio cases,

- the project on Research in Methodologies of Immunization Programme Management in Europe is operational.

### **Improving logistics and the cold chain**

By 1991, evaluation of the cold chain has been conducted in more than 50% of countries. 10% of OPV and 13% of DPT was thought to have been stored at unacceptable temperatures.

### **EPI Information Systems**

Computers at the Central level are widely used, but only 15 countries so far are using them effectively.

### **Main Problems in Europe**

The main problems affecting immunization services in Europe are:

- low priority given to immunization by Ministries of Health in many countries,
- lack of managerial skills among national staff responsible for immunization,
- insufficient surveillance,
- inadequate reporting systems for poliomyelitis at the peripheral, national and regional levels,
- the availability of vaccines is inadequate in some areas - for the more widely used vaccines in some cases, and for new vaccines such as MMR in others,
- low immunization coverage in certain geopolitical areas, as well as in certain groups of people,
- lack of communication and social mobilization in the majority of countries.

## **South East Asia Region**

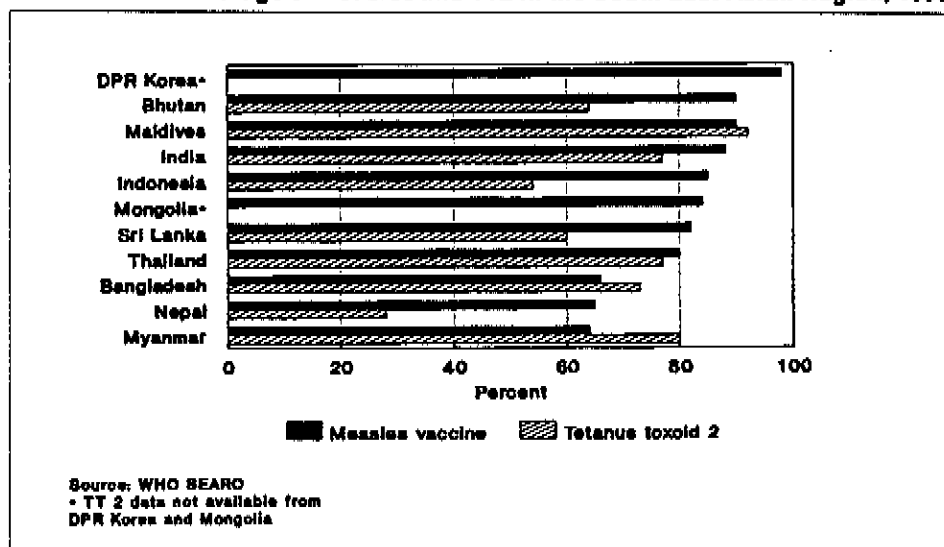
All of the South East Asia Member States have increased their efforts to achieve global and regional child immunization coverage goals. The average regional figure for infant coverage in 1990 was 91% for DPT3, 93% for OPV3, 83% for measles and 96% for BCG vaccines. All 11 Member States have committed themselves to achieve and maintain high childhood immunization coverage by the year 2000. Certain countries such as India and Indonesia have extended their 80% coverage targets to apply not only at national, but also at state, provincial and district levels.

The coverage of the second dose of tetanus toxoid vaccine among pregnant women approached 61% by August 1991 and, although it still lags behind the other antigens, there has been an improving trend over the past 13 years.

The true regional picture on the incidence of the EPI target diseases must be interpreted in the light of the known under-reporting and reporting variability from each country. The Computerized EPI Information System will eventually help to improve reporting procedures, but it is not yet fully operational in all Member Countries.

The number of poliomyelitis cases reported across the Region is decreasing, with particular improvement noted in India, the Democratic People's Republic of Korea, Maldives, Mongolia, Myanmar, Nepal, Sri Lanka, and Thailand. The regional polio laboratory network is being established with bases in Indonesia, Sri Lanka, and Thailand that will

**Figure 8**  
**Immunization coverage of measles and TT2 in the South East Asian Region, 1990.**



help all countries in the Region in more accurate diagnosis of poliomyelitis.

Since 1977/78, measles immunization coverage has slowly improved, but the incidence of this disease has not yet dramatically decreased across the Region. Nevertheless, there is a declining trend in a number of countries, with most cases occurring in the 2 to 4 year-old group.

Although not as dramatic as with poliomyelitis, the incidence of neonatal tetanus is also decreasing. In addition to immunization with tetanus toxoid, the regional strategy for disease reduction places emphasis on the training of traditional birth attendants, safe and clean delivery methods, and other integrated approaches within the context of primary health care. Under-reporting, perhaps as little as one in 10 cases reported, is important in the Region as in other parts of the world.

Diphtheria and pertussis incidence have also decreased in the Region.

Technical cooperation by the Regional Office is supporting the Member States in strengthening surveillance systems through the services of surveillance consultants, encouraging the expansion of sentinel surveillance to the sub-district level. Support is being extended to Health Statistics and Epidemiology Units with the promotion of Field Epidemiology Training Programmes and surveillance-related workshops, as well as assistance in the development of country surveillance plans as a follow-up to the June 1991 Intercountry Meeting of EPI Managers on surveillance systems and their sustainability.

#### Issues for consideration

- need for improved case definitions of EPI diseases;
- inadequate disease surveillance and slow progress in disease reduction;
- sustainability of immunization, an issue of concern due to limitations in government funding, managerial

- inefficiency; and uncertainty over donor funding in the future;
- limited attention being given to District Health System microplanning and efforts to better integrate immunization with other elements of primary health care;
  - inadequate capacity for quality control of vaccine production, with few countries having national control laboratories;
  - uncertain cold chain and vaccine reliability;
  - limited evaluation of training and supervision in immunization programmes;
  - integrating new vaccines (such as Hepatitis B) and Vitamin A and Iodine supplementation;
  - high drop-out rates and missed opportunities in some communities; and
  - lack of computers for further development of CEIS.

#### **Proposals to overcome these problems.**

- In general, new emphasis will be placed on solving the issues of sustainability, funding, manpower, training, and securing basic resources for national immunization programmes. The Regional Office for South East Asia emphasizes the adequacy of surveillance systems and other epidemiological approaches as vital elements for disease control.
- Surveillance systems will be strengthened by providing WHO consultants to countries and by convening a Regional meeting to establish a consensus on disease case definitions.

Surveillance of "EPI diseases" is only a part of the whole picture of disease surveillance, and strengthening overall surveillance should help to improve the adequacy of EPI disease surveillance. Start-up funding for countries' polio Laboratories is crucial for the sustainability of the Regional Laboratory Network.

- Introduction of new vaccines and micronutrient supplementation into the immunization schedule should be based on adequate research and the availability of local resources.
- Technically sound mass campaigns in the form of National Immunization Days or Weeks, already undertaken in Nepal, India and Bangladesh to boost immunization coverage, should be carefully implemented in selected areas, taking care to avoid jeopardizing the existing infrastructure and distorting the use of available resources.

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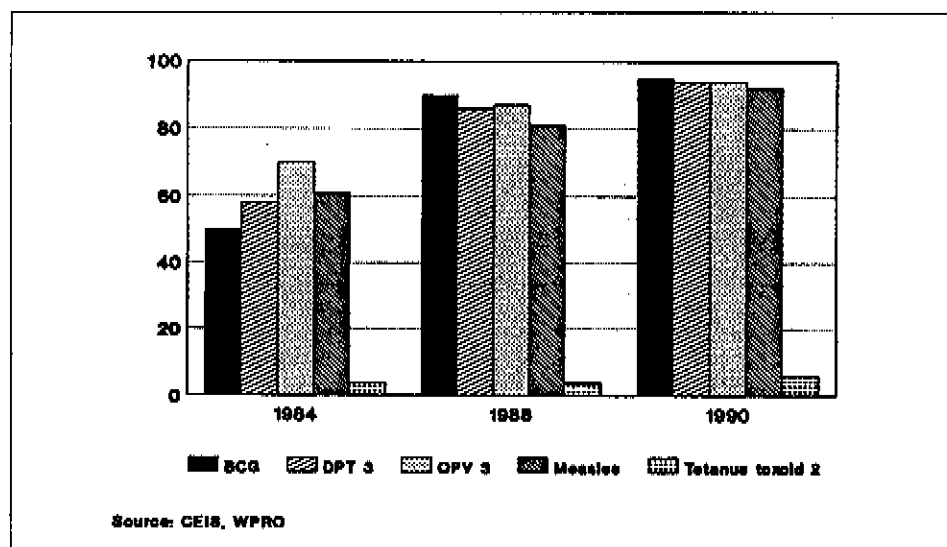
### **Western Pacific Region**

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In the 15 years since its inception, the Regional EPI has made impressive gains in both coverage and in quality of service. 80% Regional coverage with all five EPI vaccines was achieved in 1989, but there are still large contrasts among and within the countries of the Region. Reported regional coverage figures for August 1991 showed an average of 90% coverage for BCG, 86% for DPT3, 87% for OPV3 and 81% for measles. Immunization coverage with tetanus toxoid for pregnant women is low (5%) and needs to be improved.

A significant reduction in the reported regional incidence has been

**Figure 9**  
**Immunization coverage in Western Pacific in infants <1 year and pregnant women.**



observed for diphtheria, pertussis and poliomyelitis, but tuberculosis and measles persist as major causes of morbidity/mortality. Case fatality rates from measles varies quite widely, but ranges from 3% to 10% in countries like Papua New Guinea and the Philippines. Data from China demonstrate the real impact of high measles coverage on disease incidence.

Efforts in poliomyelitis eradication have intensified with the organization of a Technical Advisory Group on EPI and poliomyelitis eradication, established to keep the poliomyelitis situation in the six endemic countries under review, and to advise on the Regional Plan of Action. Among other things, the Plan placed new stress on strengthening disease surveillance, and providing more extensive routine and supplementary immunization services.

The plan also includes a focus on children under three or five years of age

(depending on the epidemiological data) for supplementary immunization activities, extension of the laboratory network, planning support and the mobilization of resources.

Neonatal tetanus elimination has made a slower start. Trends are difficult to assess since this disease is often not reported. It is however known to be a significant public health problem; community surveys in three countries demonstrated a neonatal tetanus mortality rate of 2-6 per 1000 live births. Work is now focused on planning at regional and country level, ensuring clean deliveries, improving surveillance and reporting, and increasing immunization coverage levels.

Measles control is moving ahead, founded on increasing coverage with measles vaccine, as well as targeting areas of low coverage and high risk. Again, improved routine surveillance and planning support for countries are

critical aspects of the regional strategy.

Hepatitis B (HB) infection is a major health problem in the Region, and HB immunization has been made routine now in some 25 countries.

In the effort to improve disease surveillance and monitoring – as well as enhancing the completeness and timeliness of reporting – training courses on surveillance have been conducted, and new monitoring indicators have been proposed. These include:

- reporting completeness;
- case reporting timeliness;
- laboratory specimen completeness;
- case investigation timeliness;
- outbreak response timeliness;
- percentage of districts/counties with poliomyelitis cases,

and the countries will be requested to use the indicators every quarter starting in 1992.

Commitment to sustaining all of this progress, and to moving forward with the targets for the 1990s, has led the Region to establish Inter-Agency Coordinating Committees at the regional and national levels. This committee will meet twice a year for the next two years, and donor coordination is taking place in an increasing number of countries.

Among the priority concerns, the Region will stress:

- strengthening immunization activities through poliomyelitis eradication;
- preparation of plans and guidelines for neonatal tetanus and measles control; and

- the improvement of vaccine supplies, logistics, cold chain and management (including issues related to vaccine production, distribution and potency testing).

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## Global Overview

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The EPI is moving forward with ambitious new goals for the decade of the 1990s towards the ultimate vision of a world free from suffering, disability and death due to vaccine-preventable diseases.

The achievement by governments of the 1990 target of 80% immunization coverage among infants worldwide for BCG, three doses of DPT and OPV, and measles vaccines represents a milestone on the way to universal childhood immunization.

This progress in global immunization is directly attributable to the efforts of national governments, the World Health Organization, the United Nations Children's Fund and other United Nations Agencies, bilateral development agencies, and non-governmental organizations such as Rotary International. The development of the capacity to achieve these levels of coverage of infants represents a major public health triumph for the decade of the 1980s.

Global statistics, however, mask disparities among regions, countries, states/provinces, and districts. Differences in immunization coverage levels reflect the varied development of the primary health care infrastructure and are one of the measures of the degree of equity and social justice that communities have

**Table 1**

**Estimated immunization coverage with BCG, DPT, poliomyelitis, measles and tetanus vaccines based on data available as of August 1991.**

Country	Newborns surviving to 1 year of age (millions)	Cumulative % of surviving infants	Immunization coverage (%)				
			Children less than 1 year of age				Pregnant women
Developing countries ranked by surviving infants			BCG	DPT3	Polio3	Measles	Tetanus2
1 India (90)	24.03	22	97	92	93	87	77
2 China (91S)	23.30	42	99	97	98	98	-
3 Nigeria (90C)	4.63	47	96	57	57	54	58
4 Indonesia (90C)	4.59	51	93	87	91	86	54
5 Pakistan (91S&C)	4.22	54	87	83	83	75	87
6 Brazil (7&90C)	3.86	58	78	81	93	78	62
7 Bangladesh (91S&C)	3.89	61	86	62	62	54	74
8 Mexico (7&90C)	2.36	63	70	66	96	78	42
9 Ethiopia (90S&C)	2.05	65	57	44	44	37*	43
10 Iran (90C)	1.99	67	95	93	92	83	50
11 Viet Nam (90C)	1.92	69	90	87	87	87	18
12 Philippines (90C)	1.89	70	96	88	88	85	43
13 Egypt (90S&C)	1.61	72	88	87	87	86	63
14 Turkey (90C)	1.46	73	-	84	84	76	-
15 Zaire (9&91S)	1.45	74	65	32	31	31	29
16 Thailand (90C)	1.23	75	99	92	92	80	79
17 Tanzania (9S)	1.20	77	93	85	82	83	42
18 Myanmar (90C)	1.10	78	75	69	69	73	54
19 Kenya (7S&90S)	1.01	78	80	74	71	59	37
20 Sudan (90C)	0.98	79	73	62	62	57	14
21 Colombia (9&90C)	0.84	81	95	87	93	82	40
22 Algeria (91S&C)	0.80	81	99	89	89	83	27
23 Uganda (90C)	0.71	80	100	77	77	74	31
24 Iraq (90C)	0.69	82	96	75	75	62	67
25 Morocco (90C)	0.66	83	96	81	81	79*	64
25 countries	92.26	83	93	86	88	82	40
Other developing countries	19.43	17	85	65	66	65	38
Total developing countries	111.69	100	90	83	85	79*	39
Total industrialized countries	18.13		87	83	87	83	-
<b>Global Total</b>	<b>129.82</b>		<b>90</b>	<b>83</b>	<b>85</b>	<b>80</b>	<b>34</b>

(7) 1987 reported data

(C) country supplied demographic data

(9) 1989 reported data

(S) survey data

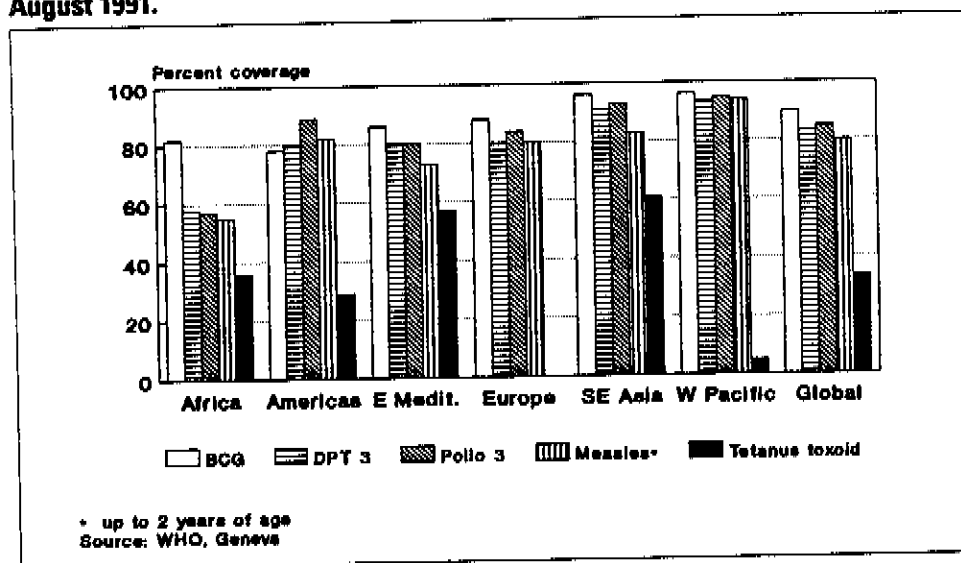
(90) 1990 reported data

- no information available

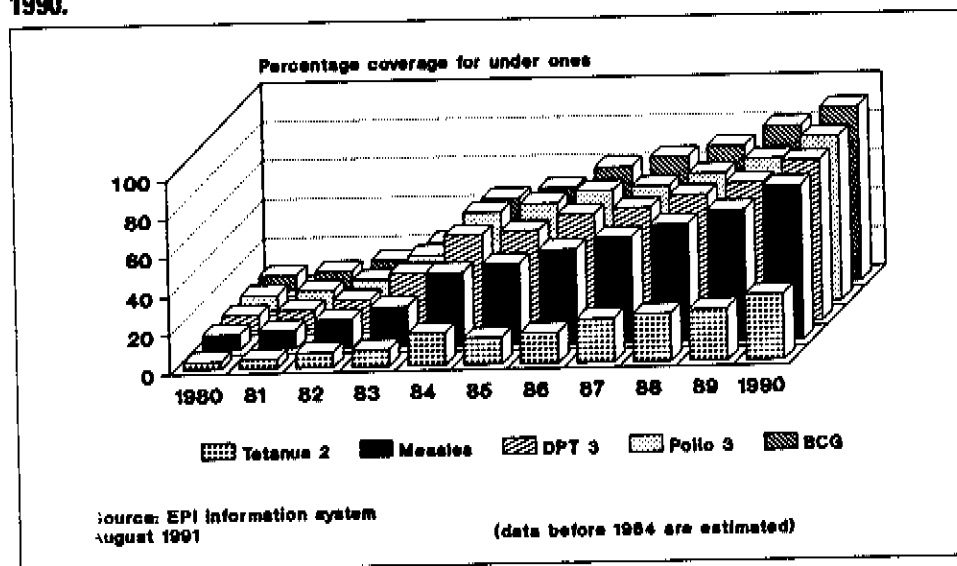
(91) 1991 reported data

\* Up to 2 years of age

**Figure 10**  
**Immunization coverage of children less than 12 months of age by WHO Region August 1991.**



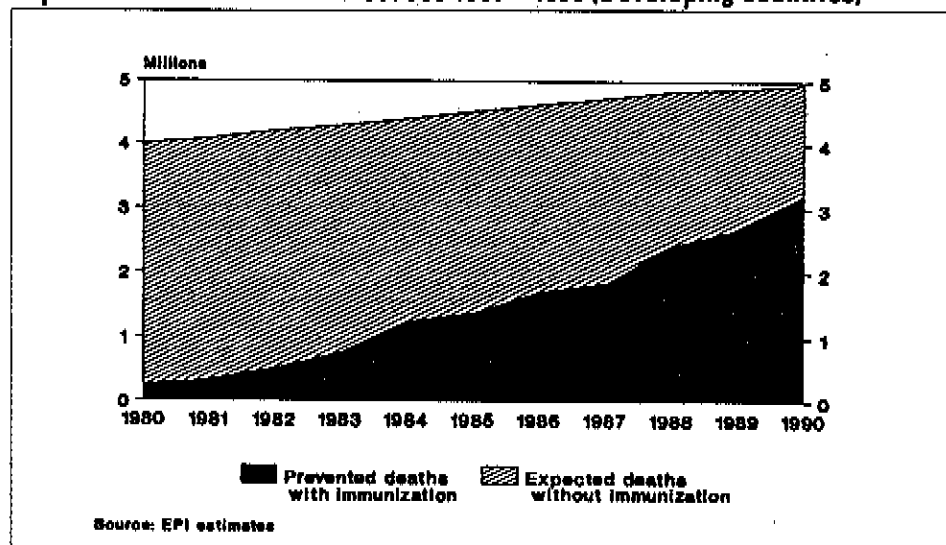
**Figure 11**  
**Expanded Programme on Immunization Global immunization coverage 1980 - 1990.**



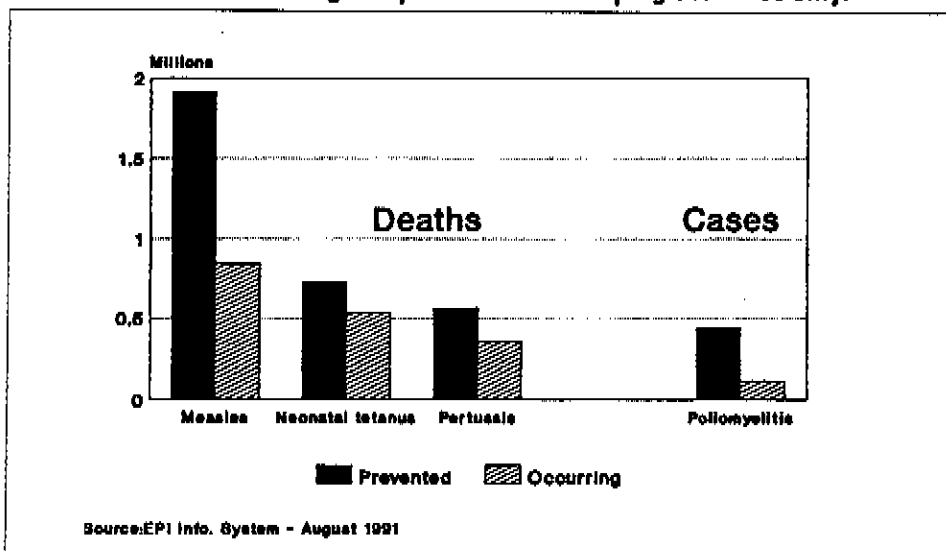
achieved. Also the much lower coverage of 39% reported for tetanus toxoid for pregnant women in developing countries to protect their newborns from

neonatal tetanus serves as a reminder that neonatal tetanus was the "forgotten" vaccine-preventable disease of the last decade.

**Figure 12**  
**Expected deaths due to EPI diseases 1980 – 1990 (Developing countries)**



**Figure 13**  
**Cases and deaths occurring and prevented. Developing countries only.**



At present levels of immunization coverage, it is estimated that through immunization programmes some 3.2 million deaths are prevented each year from measles, neonatal tetanus and pertussis, as well as some 440,000 cases

of paralytic poliomyelitis (figures 12 and 13).

The urgency for continuing to raise immunization coverage levels, focusing on disease control and adding new

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vaccines, is underlined by the occurrence of an estimated 1.7 million deaths each year due to these same diseases, some 120,000 cases of paralytic poliomyelitis and 1-2 million deaths attributable to hepatitis B infection. These are preventable with currently available vaccines.

# 4.

## EPI FOR THE 1990S

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A paper, "EPI for the 1990s", was presented that gave details on the lessons learned, goals, priorities and strategies, planning and coordination, new vaccines and vaccine supplies, training, monitoring and evaluation, research and development, and the roles of National Governments, WHO, UNICEF, and other organizations, bi-lateral development assistance agencies, disease control collaborators, and non-government organizations. This paper was endorsed with revisions to include resource needs, mechanisms for Global donor coordination, communications, urban immunization and programme sustainability. The revised paper will be reproduced by WHO/EPI, and will serve as the basis of the EPI progress report to the WHO Executive Board and the World Health Assembly in 1992, and will form the basis for developing a WHO and UNICEF joint policy statement.

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### Achieving 90 percent immunization coverage by the year 2000

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Dramatic progress has been achieved during the decade of the 1980s to increase immunization coverage in infants in developing countries from a base of approximately 20 percent in 1981 to 80 percent in 1990. Reported immunization coverage of pregnant women in developing countries with

two doses of tetanus toxoid climbed in August 1991 to 39 percent, or 49 percent if China, which does not give tetanus toxoid immunization, is excluded. This success is the result of a combination of several factors.

A target of 80 percent for "Universal Child Immunization" by 1990 was clearly understood by health workers, community members and leaders from sub-national and international levels.

Strong political will and intense social mobilization have created new patterns of multi-sectoral collaboration in health care. Numerous Heads of State have lent their personal prestige and political support to launch and even monitor immunization programmes. While the large-scale national campaigns of the mid-1980s were very potent to start the acceleration phase and get political visibility, experience has shown that building vaccine delivery systems and the empowerment of communities are required to ensure a high and sustained immunization coverage.

Achieving 90 percent immunization coverage by the year 2000 provides the basis upon which the three disease targets can be realized. Lessons learned in the 1980s will apply to consolidate and improve the efficiency and resource-effectiveness of national immunization programmes.

The goals of the World Summit for Children and the Convention of the

Rights of the Children can serve as the basis for demanding high level commitment together with adequate resources. The funding base must be expanded and maintained above 1990 levels. Countries should be encouraged to take over more of the cost of their immunization programmes with the support of the Vaccine Independence Initiative and other mechanisms. The specific disease control initiatives will help to maintain political visibility, goal orientation and social mobilization at both national and international levels.

Countries with high levels of coverage – 33 countries had 90 percent or greater coverage for the third dose of DPT and OPV and 20 countries had 80% coverage for measles vaccine by the end of 1990 – should focus efforts on achieving and sustaining high levels of coverage levels in all districts and for the hard to reach population groups. These countries should also strive to improve the quality of services through the most efficient use of resources. A special effort will be required to increase tetanus toxoid coverage which is still lagging behind in many of these countries. Other MCH services, such as Vitamin A and iodine supplementation, antenatal care, diarrhoeal diseases and acute respiratory infection control should be offered simultaneously with immunization contacts.

Countries with mid-level coverage, which are a majority, should identify areas and population groups with lower coverage and direct efforts and programme resources to those areas in greatest need. Interventions to target infants, reduce drop-out rates and missed opportunities should be systematically implemented and their impact monitored. All provinces and districts

should reach the 80% immunization coverage by 1995. Monitoring the completeness and timeliness of surveillance reports should be the first step to establish simple, low-cost and effective surveillance systems which will help to identify the remaining pockets of susceptibles.

Countries with immunization coverage below 50% generally have mitigating circumstances such as war, civil strife, economic hardship, underdeveloped infrastructure or sparsely settled populations. Fifteen of the twenty countries in this group are in Africa. The highest priority is the rehabilitation and extension of their capacity to build sustained vaccine delivery systems. In areas affected by conflicts, the concept of "corridors of peace" and "days of tranquillity" should be promoted to reach highly vulnerable groups including refugees. After careful evaluation, in some countries with low coverage, special eradication/elimination activities may be undertaken if it is determined they are likely to hasten the strengthening of the immunization infrastructure (e.g., if such activities can help mobilize the resources to enhance the overall immunization programme). Extensive support from the international community is urgently needed to help these countries to reach the 90% immunization coverage target and to proceed towards the disease elimination and eradication goals.

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## Disease control initiatives

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### Neonatal tetanus elimination

Of the 90 countries at risk for neonatal tetanus, 83 have developed a national elimination plan. Of the

remaining 7, China and Vietnam will have national plans prepared by early 1992.

Ninety per cent of countries are now reporting neonatal tetanus separately from tetanus contracted at older ages but there is no information available on the proportion of districts submitting monthly reports, including "zero" cases.

The following training material is available for EPI managers:

- Senior planning and replanning modules
- District planning and replanning modules

Immunization coverage of pregnant women in developing countries with at least 2 doses of tetanus toxoid coverage is 39% including China, and 49% excluding China. In 1990, only 30% of countries at risk have tetanus toxoid coverage - for protective doses beyond the second dose - equal or greater than that of OPV3. However, the tetanus toxoid coverage from routine reports are often inaccurate. These figures are usually under reported and only 17% of the populations of developing countries have had tetanus toxoid coverage measured through surveys which is, so far, the only accurate method available.

Little information is available on the proportion of child immunization clinics screening and immunizing women when they bring a child for immunization. This should be calculated as the proportion of immunization clinics for children offering tetanus toxoid to accompanying women.

Only a few countries have up-to-date information, but it is estimated that in 1990 only 52% of pregnant women in the developing world delivered with a

trained attendant present. Furthermore, maternal mortality rates and the provision of antenatal care are not reported routinely.

With a revised and more accurate methodology it is estimated that 745,000 deaths are currently being prevented by tetanus toxoid immunization and clean delivery practices; but 440,000 are still dying from neonatal tetanus each year.

16 countries are responsible for 80% of neonatal tetanus deaths world-wide and 5 countries (China, Bangladesh, Indonesia, India and Nigeria) account for 60% of the deaths.

An 18 month plan to evaluate the quality of tetanus toxoid in 13 countries has been produced. This plan was developed with the collaboration of the Task Force for Child Survival and the Centers for Disease Control and includes seroconversion studies, potency testing and a standardized case investigation to evaluate reported tetanus toxoid failures.

Major technical issues:

- Mothers of neonatal tetanus cases are at higher risk of having another baby suffering from neonatal tetanus.
- The exact proportion of births protected from neonatal tetanus through the administration of tetanus toxoid to the mother is not known.
- The validity and usefulness of routinely monitoring tetanus toxoid protection of mothers at the first DPT contact for their offspring has not yet been assessed.

Major managerial issues:

- Funds to implement the proposal to assess the quality of tetanus toxoid are not available.

- The pace of implementing plans of action and GAG recommendations is slow since district plans have rarely been developed, priorities have not been set and programme managers are not clear how to implement the neonatal tetanus, measles and polio initiatives simultaneously.
- Yearly targets and activities are not yet established at regional, national and district level.
- Impact of tetanus toxoid coverage on neonatal tetanus reduction is not satisfactory, largely because efforts are not focused on high risk areas or population groups.

### Measles reduction

With 80% global coverage of measles vaccine in 1990, tremendous strides have been taken to control the disease. However, this figure hides the presence of many areas of low coverage, particularly in the African Region and in most countries where there has been armed conflict. Efforts in the next five years must raise coverage in all districts and areas. An additional sub-goal has been set to reach 90% coverage in all countries and districts by 1995.

As the measles target date of 1995 approaches, it has become urgent to energize programmes to put essential components of the disease control initiatives into place. In particular, there is a need in every country for an effective surveillance system to focus activities to areas where they are most needed. Not only the measles control initiative would benefit from identifying high risk areas, it is likely that other communicable disease control efforts would also benefit. Also, assessing whether the goals

set by the World Health Assembly and the 1990 World Summit for Children have been achieved will require surveillance techniques yet to be refined.

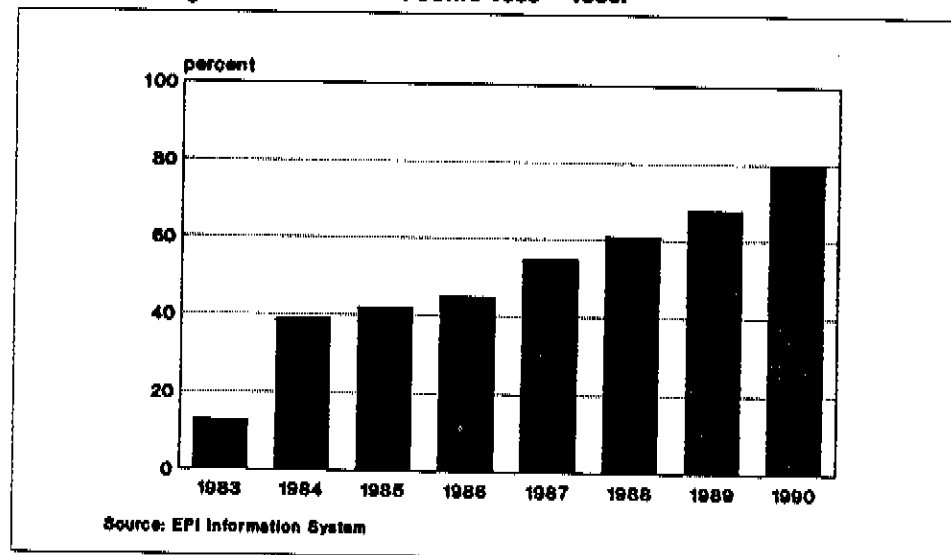
The measles reduction goal will need an exceptional effort if it is to be achieved. Increasing immunization coverage in itself is unlikely to reduce the number of cases (and hence the number of complications and deaths) to meet the 1995 goal for reduction in the number of deaths. Cooperation with other primary health care initiatives already active in this area will be needed to ensure that treatment is available for complications of measles such as diarrhoea and pneumonia.

Administration of vitamin A to cases of measles in areas of vitamin A deficiency is encouraged as another component of reducing mortality from measles infection. Prophylactic vitamin A supplementation is also encouraged in these areas. Immunization programmes are an appropriate vehicle for delivery of vitamin A, as are other PHC activities.

Outbreak control methods also need development. In general, outbreaks should be taken as an opportunity to undertake analysis of the problem and to correct deficiencies in services and policy, and to raise public awareness of the availability of immunization services. Unless coverage is high, additional immunization activities in response to outbreaks may not be the most efficient use of resources.

The greatest priority for available measles vaccine is to assure that each child throughout the world receives one dose of vaccine. As more countries adopt multidose schedules or conduct

**Figure 14**  
**Global coverage with measles vaccine 1983 – 1990.**



mass campaigns, current supplies may be strained. It is essential that vaccine producers anticipate and be encouraged to meet the increasing demands for measles vaccines in the near future.

A number of difficulties relating to measles vaccine for use at six months of age have meant that countries have not been able to implement the 1989 EPI recommendation for high titre Edmonston-Zagreb measles vaccine. Further research in this area is needed. In the first quarter of 1992, WHO will be seeking expert advice on the issue of safety and efficacy of measles vaccine administered at six months of age.

#### **Poliomyelitis eradication**

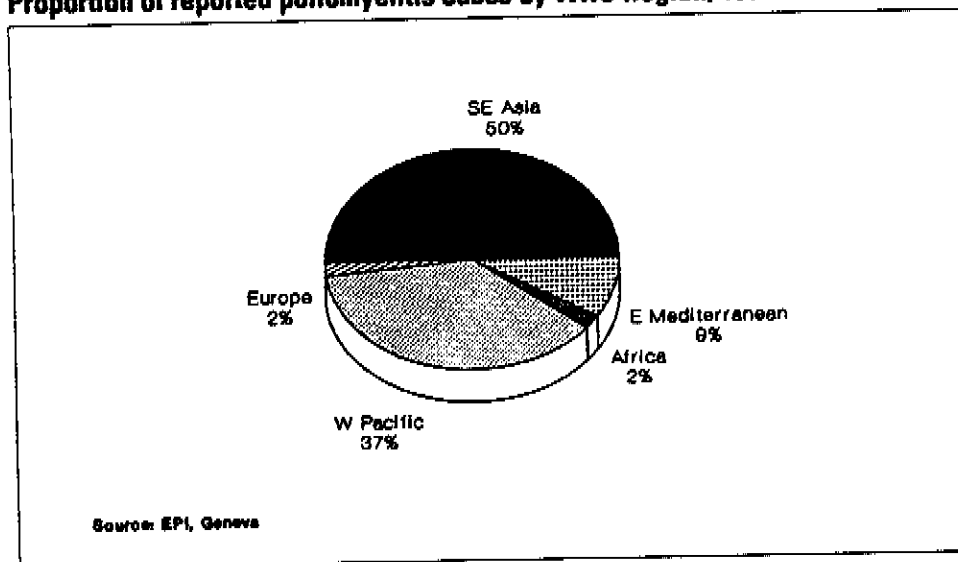
Marked progress has been made towards the global eradication of poliomyelitis by the year 2000. The Region of the Americas is on the point of interrupting wild virus transmission, while appropriate policies are being

widely implemented in most other Regions. Five Regions have reported polio vaccine immunization coverage over 80% and the downward trend in incidence has continued. In 1990, 16,997 cases were reported to WHO, representing a 27% decline from the previous year, but still only 14% of the estimated incidence.

The African Region, faced with major constraints, has made steady progress.

Evidence that supplementary immunization campaigns would frequently be necessary to interrupt wild virus transmission has been confirmed in several countries in the last year. A "mopping-up" strategy, in which all children aged under 5 years received 2 doses of OPV, a month apart, house-to-house, formed the basis for successful control operations around the last cases in the Americas. Similar policies are being developed in the other Regions.

**Figure 15**  
**Proportion of reported poliomyelitis cases by WHO Region, 1990.**



Campaigns aimed at strengthening routine immunization services remain necessary in high risk areas, among high risk populations and where "local" coverage remains markedly below national averages.

The success of immunization is not yet being matched by development of surveillance. Some progress has been made in case reporting from Member States to WHO. By September 1991, 67% of countries had reported for the first six months of 1991, with almost complete reporting in the American, European and Western Pacific regions. The same level of reporting efficiency within countries is only being achieved in the Americas and high priority needs to be given to ensure complete and timely reporting and adequate investigation of suspect cases.

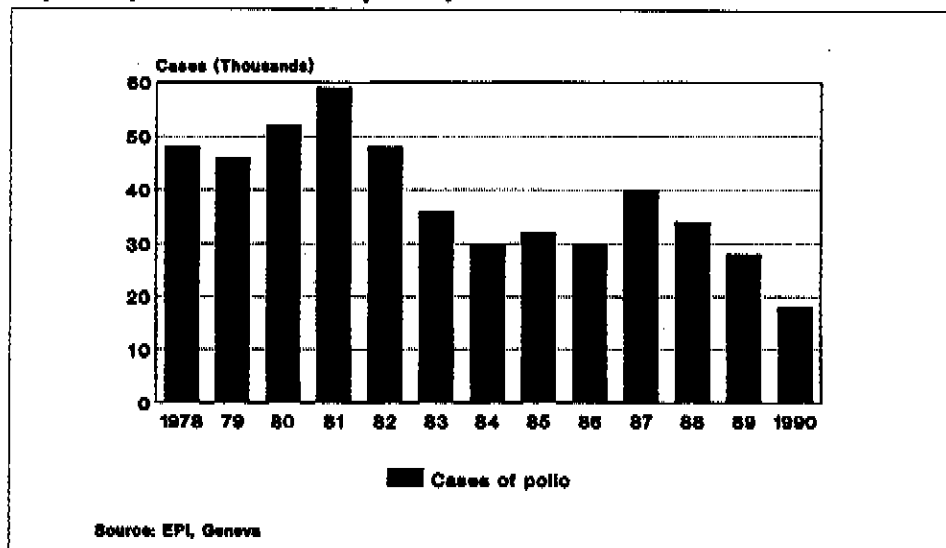
A number of Regions have held workshops aimed at strengthening surveillance.

In the past year, development of the polio laboratory network has progressed. This has been achieved through training courses, the work of the Specialized Reference Laboratories, establishment of 3 new Regional Reference Laboratories and visits to other potential Regional and National Laboratories. Samples have been collected in many outbreaks. Collection of samples will progress as the incidence of suspected cases declines and surveillance and case investigation improves.

A manual, "Guidelines for the Prevention of Deformities in Polio" aimed at developing community and domiciliary rehabilitation, has been prepared.

Meetings have been held to discuss and prepare proposals for research into environmental sampling, production of a more thermostable OPV and development of simpler and more rapid diagnostic tests. Operational research is being developed to investigate the

**Figure 16**  
**Reported global incidence of poliomyelitis, 1978 – 1990.**



impact of different control strategies, to research the ideal formulation of OPV and the possible role for combined immunization schedules.

A number of constraints have become apparent:

- a lack of resources, especially funds to purchase vaccine and to develop the laboratory network, is severely limiting progress in countries strongly committed to implementing WHO recommended policies;
- several countries are attempting to interpret "mopping-up" in a limited way, rather than conducting the essential extensive and detailed house-to-house immunization that proved necessary in the Americas. It is doubtful if such short cuts will prove effective;
- poor seroconversion rates, especially for Type 3, continue to indicate the desirability of producing a more immunogenic, thermostable vaccine

and, most critically, to use strategies maximizing the impact of vaccine administration;

- vaccine failing to meet WHO requirements continues to be widely used.

Until these constraints are tackled, there can be no guarantee that the target of polio eradication by the year 2000 will be met.

#### Research and development

A report of the R&D activities over the past year, including the 8th and 9th meetings of the Research and Development Group was presented.

Research and development has been an integral part of EPI since the inception of the programme, however, activities were formalized and extended in 1987 with the formation of the R&D Group. The R&D group was founded based upon research questions arising from field managers.

Data arising from R&D activities have been useful in guiding programmatic activities, and results of R&D projects have been incorporated into the training and operational aspects of the programme.

Activities were reported in five broad areas: vaccine preventable diseases; behavioural studies; integration of primary health care; logistics for health, and computer applications. Highlights of important research issues were reported, in areas such as elimination of neonatal tetanus (delayed release tetanus toxoid), control of measles (vaccines for use in the face of maternal antibody, development of diagnostic tests) and the eradication of polio (updates on field trials, including improved seroconversion against the three polio serotypes following IPV or OPV, administered at the time of measles immunization).

Areas of concern, including reports of sub-optimal tetanus toxoid efficacy in a number of countries, have resulted in protocols to examine the dimensions of, and to identify methods of, remedying the deficiencies. Suggestions of late deaths following the administration of high-titer measles vaccines before the age of nine months was examined in February 1991 by an ad-hoc consultation. At that time the data were found to be insufficient to change the policy, (Weekly Epidemiological Record, 23 August 1991). However, because of additional reports of adverse events, the consultation will be reconvened to review again the issue of the advantages and disadvantages of the use of high titre measles vaccines before 9 months of age.

Investigations of missed opportunities have resulted in a mid-level training module addressing control of these events.

Over the past year attempts have been made to consolidate and focus research on various aspects of vaccine preventable disease, to further the integration of primary health care and immunization and to investigate strategies for disease control and improvement of surveillance systems.

Efforts to coordinate R&D activities with other WHO programmes have continued and have been expanded through interaction with the Children's Vaccine Initiative, which has incorporated some EPI projects into "product development groups" and task forces.

The R&D group is working closely with the secretariat of the Children's Vaccine Initiative to develop projects of mutual interest.

### **Children's Vaccine Initiative**

A brief history of, and a plan for, the Children's Vaccine Initiative (CVI) was presented to the GAG. This included a mission statement, long term and specific plans, organizational structure, implementing mechanism and the work plan. These activities have been discussed and endorsed in principle by the CVI Management Advisory Committee and Standing Committee.

The CVI will not duplicate the activities of existing WHO programmes, but will provide a highly visible goal for donors and will serve to coordinate and focus on all programmes dealing with vaccine development and implementation.

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### Donor coordination

The unusually large number of donors who attended the 14th GAG meeting in Turkey provided an opportunity for them to discuss ways to achieve a more effective global coordination of EPI activities.

This discussion was generated partly by the successful establishment of a regional Inter-agency Coordinating Committee in the Region of the Americas. At the same time, a group of major donors to the EPI expressed a commonly felt need to participate more actively in discussions on global EPI policies, strategies and priorities, as well as their funding implications. On the initiative of the participating donors, consultations were held outside the official GAG sessions.

The consultations focused on ways to assure a more effective participation and coordination of the donor community in the EPI in the 1990s.

The result was an expression of interest in establishing a global Inter-agency Coordinating Committee under the guidance of WHO. This would complement the GAG and Technical Consultative Meetings (TECHCOMs) and provide a forum to discuss financial and coordination issues which are of key interest to the donors.

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### Resource needs of EPI strategies

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Proposed EPI strategies should be evaluated using information on effectiveness, impact on resources, sustainability, and particular country situation and infrastructure.

Decision makers at all levels in the country and at regional and global levels can use all of this information to gain a better understanding of the implications of choosing a particular immunization strategy.

Using resource needs to evaluate strategies allows decision makers to *compare* different approaches to achieve an identified goal. The information alerts decision makers to the trade-offs inherent in accepting one strategy over another.

This also allows decision makers to plan for additional budgetary, equipment and manpower needs required by a particular strategy.

An example of the impact of various strategies on the cold chain illustrated how the combined impact of a number of proposed strategies will increase the space required to store vaccines. A great increase in volume would require additional cold chain capacity at the district, regional and central level and a large additional investment in cold chain infrastructure.

# 5.

## DISEASE SURVEILLANCE

Over the last few years it has become increasingly clear to programme managers at all levels that effective surveillance is a prerequisite to achieving the specific disease control targets and for effective prevention of other infectious diseases. The EPI disease control targets established by the World Health Assembly in 1989 have greatly contributed to the understanding that better disease surveillance is a priority.

Since the GAG Meeting in 1990, all activities concerning surveillance of EPI target diseases have concentrated on efforts to improve routine systems for surveillance of infectious diseases – especially measles, neonatal tetanus and polio. Guidelines for programme managers on how to improve routine systems for surveillance of infectious diseases including EPI target diseases have been developed and were presented to the GAG.

One of the main principles in these guidelines is that the responsibility for management of disease surveillance systems and for effective use of surveillance information in disease prevention should be decentralized to district and health facility levels.

Also, diseases should be reported through the routine reporting system if:

- even one or a few cases will trigger special investigations eventually

followed by containment measures (e.g. cholera, meningococcal disease, diphtheria, polio);

- the disease is subject to a reduction programme in which reduction targets have been set (for example, measles, neonatal tetanus and polio).

The recommended indicator for effective surveillance is:

- the number of monthly reports received on time (i.e. at least before the end of the following reporting period) compared to the number of expected reports (i.e. the total number of centres that should be reported).

A simple system to monitor this indicator is proposed in the guidelines and should be introduced at all levels of the surveillance system.

For some diseases, indicators for effectiveness of surveillance and control activities can be introduced depending on the maturity of the programme.

For neonatal tetanus elimination activities, effectiveness indicators can be:

- percentage of diagnosed neonatal tetanus cases investigated within one week;
- percentage of neonatal deaths investigated.

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For polio eradication activities, the proposed effectiveness indicators are the following:

- the reported incidence rate of acute flaccid paralysis;
- the number of cases of acute flaccid paralysis investigated to confirm or exclude polio and, subsequently, the number of suspected and confirmed polio cases;
- the proportion of suspected polio cases from whom stool specimens are collected.

The guidelines were endorsed by the GAG.

Improvement of routine systems for surveillance of infectious diseases has been an important theme for the annual meetings of national EPI managers in three Regions.

Further to this, several inter-country and national workshops on disease surveillance have been conducted or are scheduled for the near future.

In all these activities, staff members from the EPI Secretariat participate as facilitators together with Regional staff and external consultants with expertise in disease surveillance. The EPI Secretariat is responsible for provision of training material. In some of the workshops, EPI managers participate with their colleagues responsible for disease surveillance; and local surveillance data are being used in case studies.

Comprehensive training material on disease surveillance is being developed by the EPI Secretariat and will be ready for distribution before the end of 1991. The material is being developed for mid-level managers at district level and the focus is on management of disease surveillance and effective use of surveillance information to improve prevention of infectious diseases. As examples, EPI target diseases have been chosen; but with the focus on management and transforming data into action, the training material has a generic value for improvement of existing routine systems for surveillance and control of infectious diseases.

# 6.

## VACCINE QUALITY

**E**PI vaccine quality has received increased attention in recent months. Reports of vaccine failure due to inadequate control of locally produced vaccine have been received; the disease control initiatives are demanding more vaccines at an affordable cost, and the creation of the Children's Vaccine Initiative has led to a greater focus on this issue. Implications of changes in policy recommendations on vaccine needs should be carefully considered so that advance planning can be done by vaccine manufacturers.

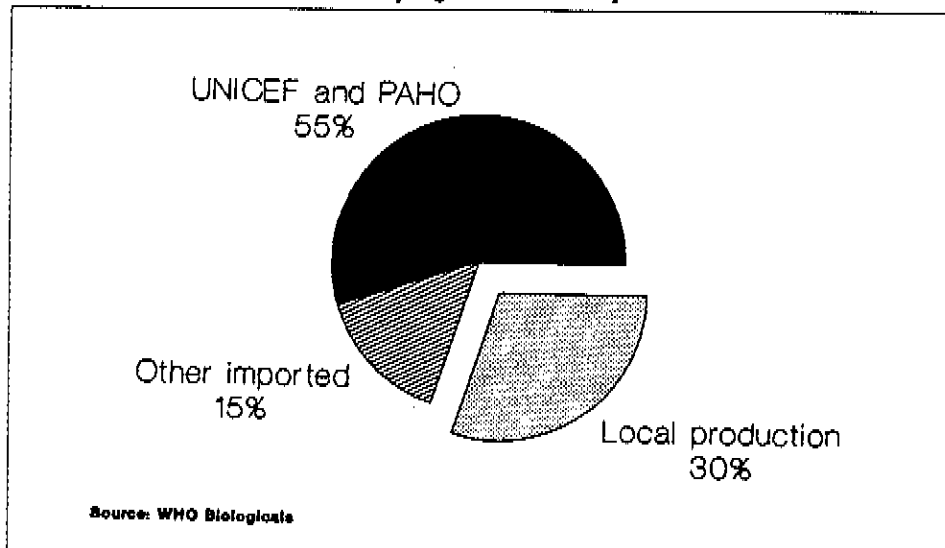
Particularly urgent is the need to assure the quality of the locally produced vaccine supply. Figure seventeen shows that locally produced vaccine

comprises almost one-third of vaccines used in the EPI.

Assurance of vaccine quality includes a number of steps, of which vaccine potency testing is just a small part. In-process control and monitoring of operating procedures must be done to insure the safety, potency, and efficacy of vaccines. The WHO production requirements give the responsibility for this to independent national control authorities in the countries where vaccines are produced.

For UNICEF supplied vaccine, WHO assures that control of quality is guaranteed by the national control authority of the country of manufacture. The insistence of other donor

**Figure 17**  
**Sources of EPI vaccines. Developing countries only.**



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agencies on the same guarantee of quality would help efforts to assure access to high quality vaccines for all children.

The activities of the national control authority have been validated for 8 out of 17 countries producing oral polio vaccine. Vaccines produced in four countries, representing hundreds of millions of doses, are known *not* to meet WHO requirements and the quality of vaccine produced in the remaining five countries is unknown.

The situation for tetanus toxoid production is of even more concern. Of 41 countries in which it is known that tetanus toxoid is produced, activities of the national control authority have been found to be appropriate in only ten. For the remaining 31 countries, the quality assurance procedures have not yet been assessed although WHO has been informed that tetanus toxoid produced

in three countries does *not* meet WHO requirements.

A procedure has been developed, which would be implemented through a Task Force under the CVI, to address the assessment and strengthening of these national control authorities, possibly through independent regional panels of experts. Immediate action to assess tetanus toxoid quality in at least three priority countries should be taken in 1992 with evaluations for presentation at the next GAG meeting. Investigations into the procurement of bulk vaccine for local blending operations would maximize supplies of good quality vaccine while lowering the price and allowing cost sharing by local governments. A procedure to establish a contingency supply of good quality vaccines where local production has been found to have problems is important to assure continuity of supply.

# 7.

## RUBELLA: PREVENTION OF CONGENITAL RUBELLA SYNDROME

**R**ubella is a mild infectious disease, most common in childhood. The clinical diagnosis of rubella is unreliable because symptoms are similar to those caused by other viruses.

If maternal rubella infection occurs during the first 18 weeks of pregnancy, before organogenesis is complete, foetal infection can cause severe permanent consequences such as structural eye, ear, brain and cardiac defects or still births.

In the absence of immunization, rubella is wide-spread and endemic. Epidemics of rubella occur every three to nine years in many developed countries affecting children and susceptible adults, including pregnant women. The epidemiology and health impact of rubella in many developing countries still needs to be defined.

The actual incidence of congenital rubella syndrome (CRS) in the world, based on mathematical models, using assumptions gathered from data primarily from developed countries, is estimated to be at least 236,000 CRS cases in every non-epidemic year in developing countries. A ten-fold increase in CRS incidence could be expected in a single country in an epidemic year.

Serological studies conducted in many developing countries have shown that rates of female seropositivity may

reach more than 90% in adulthood. However, especially in islands and more isolated countries, low rates of seropositivity (30-60%) have been found among young women of child-bearing age.

Even when rates of susceptibility are low, women who enter the child-bearing years susceptible to rubella are at risk of acquiring rubella infection in pregnancy unless rubella transmission has been interrupted.

The most expensive rubella control strategy, but the quickest route to interrupt rubella transmission and to protect susceptible pregnant women, is to use a combined strategy of immunization of infants, female adolescents and groups of women at high risk.

Routine screening of women plays little part in developing countries, where it is preferable to offer immunization at any contact. There is no evidence that rubella vaccine is teratogenic, despite careful follow-up of pregnancies when rubella vaccine has been administered inadvertently.

Since measles vaccine coverage has now reached or exceeded 80% in many developing countries, rubella vaccine could possibly be delivered in combination with measles vaccine to interrupt rubella transmission. Remaining barriers to such a policy include a lack of

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information on immunogenicity and reactogenicity of rubella vaccine in children six to nine months of age.

Where a combined strategy cannot yet be introduced, selective immunization of the highest-risks groups may be initiated. While interruption of transmission through high coverage with universal childhood immunization may appear attractive, there are potential risks associated with such a strategy. If coverage is not sufficient to interrupt transmission but merely shifts the age specific infection rate to older groups, then the potential exists for more cases of CRS than would have occurred in the absence of immunization. There are many gaps in our knowledge, particularly in the developing world, and rubella vaccine immunization programmes have the capacity to do harm, if initiated without proper care.

Before initiating any programme of rubella immunization, countries should determine whether the health impact of disease is sufficient to warrant a major control effort. If so, countries must identify prospects for surveillance, assess the sustainability of coverage and select the appropriate immunization strategy. If it is not feasible to introduce a combined strategy, selective immunization of the highest risk population should be introduced.

Measles-mumps-rubella (MMR) vaccine has recently been introduced in France and the UK to interrupt transmission of rubella, eliminate CRS and mumps, and increase measles vaccine coverage. These initiatives were accompanied by media campaigns to inform the public, and by special monitoring and surveillance activities.

# 8.

## CONTROL OF PERTUSSIS IN THE WORLD

**P**ertussis continues to be an important disease during infancy and childhood, particularly among those who are inadequately immunized.

During the past 15 years, a successful immunization programme has been implemented in most countries of the world. However, some problems have arisen in the industrialized world where pertussis has been either well controlled previously or should have been. These problems have resulted in a return or persistence of pertussis in UK, Sweden, western Germany, USSR and Italy.

The indirect or underlying causes of these problems are apathy and complacency on the part of physicians and parents, negative attitudes to immunization spread by anti-immunization pressure groups using a wide range of media and litigation over liability for alleged vaccine-related injuries. In developing countries, immunization coverage with the third dose of DPT in infants exceeds 80% but there are considerable differences in coverage rates between regions and between countries. Even within countries there are great differences of immunization coverage rates: usually for the under-served urban areas, displaced population groups, nomads and refugees.

Failure to reach and maintain high immunization coverage in developing countries are caused by multiple factors including weak management of immunization services, missing opportunities to immunize eligible children and ineffective information and motivation of mothers to return to complete the immunization series and on the benefit and importance of immunization.

The GAG recommends that all countries should use the pertussis vaccine which is available in immunization programmes for children. Since acellular pertussis vaccines are not generally available, the widespread use of DPT vaccine containing the whole cell pertussis component should be continued. All efforts should be directed to increase or maintain at least 90% immunization coverage in all districts with DPT immunization. Surveillance of pertussis morbidity should be strengthened in all countries. More information on the present epidemiological pattern of pertussis, especially the age distribution of pertussis cases in developing countries and their immunization status, is needed. Such information will help to determine whether a booster dose policy of DPT vaccine in children above one year of age in developing countries is needed and, if so, the appropriate age.

# 9.

## ADDRESSING MICRONUTRIENT SUPPLEMENTATION THROUGH THE EPI

**V**irtual elimination of iodine and vitamin A deficiency by the year 2000, as well as reduction of iron deficiency anaemia among women of childbearing age by one-third of 1990 levels, are goals of both the World Health Assembly and the 1990 World Summit for Children. The Montreal conference on Ending Hidden Hunger emphasized that the economic benefits from reaching these goals will far exceed the cost.

The choice of strategies to deal with micronutrient deficiencies is dietary diversification, fortification and direct supplementation. In practice, effective strategies in any country will often depend on a mix of approaches. The rationale for using immunization programmes to deliver supplements to both infants and mothers in areas of recognized deficiency is to obtain a positive short term impact while long term sustainable strategies for dietary change or fortification are being developed.

Over the past year, there has been considerable progress:

- agreement on the relevance of immunization programmes in providing a delivery system for supplements to young children and mothers.
- planning by UN, bilateral agencies and India (the country with the

largest number of children at risk) has started to address the scale of resources needed for supplementation both in terms of supply needs and funding.

Progress in other areas has been more limited. For example:

- a slow development of situation assessments and operational plans by countries.
- weak reporting and monitoring of coverage and progress for those countries which deliver nutrition supplementation.
- lack of materials for training.

### Issues specific to vitamin A

The current WHO recommendations for supplement delivery to infants start at the age of six months. Little information is available as yet about the safety and impact of vitamin A supplements in the early months of life. A joint WHO/UNICEF consultation on vitamin A supplementation held in Geneva, December 1990, called for careful evaluation of the research studies currently in progress before any changes be considered in the present schedule.

Vitamin A supplements should only be given to women of child bearing age at childbirth or within four weeks after

**Figure 18**  
**Nutrition supplementation through immunization programmes.**

<i>Age of child:</i>	<i>Immunization</i>	<i>Supplimentation</i>
At birth	BCG, OPV 0	
At 6 weeks	DPT 1, OPV 1	
At 10 weeks	DPT 2, OPV 2	
At 14 weeks	DPT 3, OPV 3	
At 9 months	Measles	Vitamin A and iodized oil
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<i>Women 15 - 45 yrs:</i>		
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During pregnancy	Tetanus toxoid	Iron, iodized oil
Within 4 weeks after delivery		Iron, vitamin A

delivery. Vitamin A supplements and iodized oil may be given simultaneously to infants.

### Issues specific to iodized oil

Iodized oil is safe in pregnancy. It is important that pregnant women be included in programmes delivering iodized oil because of the serious risks of iodine deficiency to the foetus and newborn. A single oral dose of iodized oil (1.0 ml:480 mg) gives protection against iodine deficiency disorders in the foetus and infant for about 1-2 years. Injectable iodized oil will protect for 3-4 years.

Laboratory studies have shown no immediate effect on OPV replication when OPV strains are incubated with iodized oil but the current recommen-

dation is still to avoid giving oral iodized oil at the same time as OPV until there is confirmation of these findings.

Injectable iodized oil can be given safely at the same time as OPV and other EPI antigens.

### Issues specific to iron

Inadequate supply of iron supplements had been identified as a major constraint in iron deficiency control programmes. Pregnant and lactating women are highest priority among vulnerable target groups for oral iron supplementation.

Tetanus toxoid administrations during pregnancy is an opportunity to supply iron supplements. Infants should not be given iron supplements through immunization programmes.

# 10.

## LOGISTICS AND COLD CHAIN

**I**n a key change of policy on the supply of disposable syringes to immunization programmes, both UNICEF and USAID are now about to supply auto-destruct syringes which allow only one use and are packed in self-incinerating "sharps" containers. This policy remains in accordance with the earlier recommendation that reusable and sterilizable equipment is the equipment of first choice for immunization programmes. This will guarantee that injections for immunization made with disposable equipment cannot contribute to the spread of infection and that used syringes will no longer be a danger to health staff and to the community. The introduction of time, steam and temperature indicators into routine use will help to provide the same guarantee of safety for reusable syringes and needles.

A second decision of importance to the EPI has also been taken by UNICEF to call for the use of time-temperature indicators on every vial of oral polio, measles, DPT and BCG vaccines supplied under the next two-year tender.

Three important steps have been taken in the field of transport. First, training materials have been developed and are being tested for the advanced instruction of vehicle drivers and motorcycle riders. Second, transport management and planning techniques have been incorporated into EPI mid-level management training and senior

level planning workshops. Third, meetings have taken place between WHO, UNICEF, the Inter-Agency Procurement Services Organization (IAPSO) and the vehicle and motorcycle manufacturers to explore the potential for purchase contracts and local service agreements which effectively guarantee maintenance and spare parts for the lifetime of donated vehicles.

The conclusion from reports on a number of country surveys on the reliability and cost of solar refrigeration, is that solar (photovoltaic) energy is an effective energy choice for the cold chain in areas where liquid propane gas supplies cannot be guaranteed and where the experience with kerosene is poor. Efforts are being made to reduce the high cost of solar energy and to broaden the benefits by also providing light and communications. Data transmission is to be investigated for reporting of disease, indicators of programme performance and supply requests.

The WHO and UNICEF Technical Network for Logistics in Health (TECHNET) has set priorities and have collaborated during the last year on fourteen projects. Participants will meet in November 1991 to review progress and re-consider the priorities due to the urgent need to assess the logistic impact of disease eradication, elimination and control objectives.

# 11.

## REPORT ON THE PROGRESS OF THE VACCINE INDEPENDENCE INITIATIVE

The Vaccine Independence Initiative has been developed to provide a mechanism for selected countries to become self-reliant in vaccine procurement, one of the most critical elements in an immunization programme.

Those countries which are capable of financing their own vaccine needs will be taking on this responsibility in the coming years. This group of countries does not include the neediest countries which will continue to require donations, nor does it include the industrialized countries, but is focused on the "middle income" countries.

However, although these governments are able to provide adequate local currency or, on occasion, hard currency

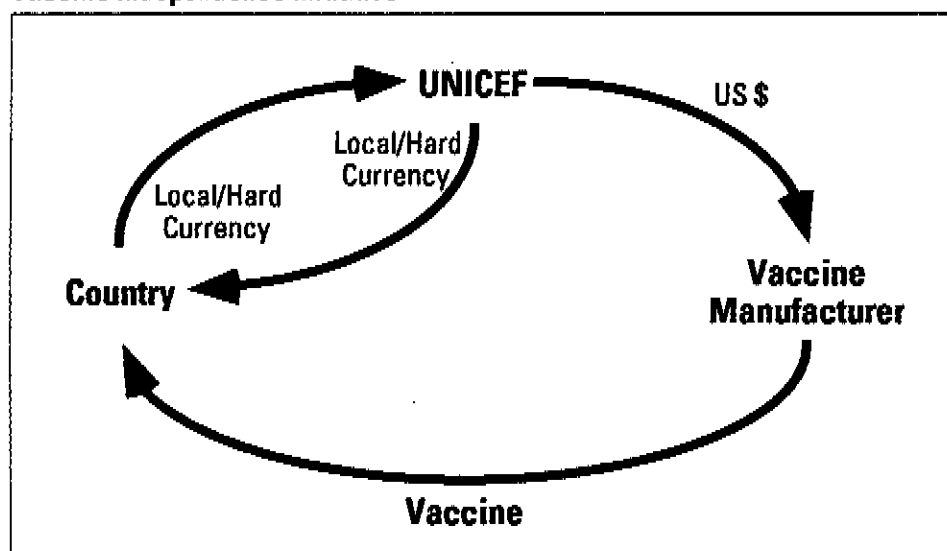
for purchasing vaccines, they face a variety of difficulties which require the flexible and supportive services offered by the Vaccine Independence Initiative.

To provide these services the Initiative has four components:

- a revolving fund;
- a global vaccine procurement mechanism;
- a mechanism to use local currencies to replenish the dollar fund;
- a planning and budgeting process with inter-ministry agreement.

To test and refine the Initiative, it has only been offered to some countries in the Middle East and North African area. After successfully implementing and

Figure 19  
Vaccine Independence Initiative



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testing, the Initiative will be offered to other regions of the world.

Two countries, Morocco and Syria, have started to implement the Initiative. The proposed structure in each of these countries illustrates how different needs can be accommodated by the Initiative.

– For countries with a convertible currency, the Initiative helps to strengthen the planning and budgeting process while also building the inter-ministry cooperation critical for the guaranteed financing of vaccines. The Initiative also provides these countries with a dependable procurement system offering high quality, low cost vaccines.

– For countries with a non-convertible currency, the Initiative helps to exchange the Ministry of Health's local currency into the hard currency needed to purchase vaccines.

The Initiative is currently focused on providing countries with a mechanism to smooth the procurement of EPI vaccines but could be expanded to other vaccines and supplies. While there is a ceiling on how much local currency UNICEF can accept, there is no limit to procurement if the country pays in hard currency.

The Initiative is one step toward increasing the self-sufficiency and thus sustainability of many national immunization programmes.

# 12.

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## THE 1992 GAG MEETING

**T**he dates and venue of the next GAG meeting are Monday to Friday, 12-16 October 1992 in Indonesia.

# ANNEXE A

## LIST OF PARTICIPANTS

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# ANNEXE **B**

## LIST OF DOCUMENTS

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<b>Reference</b>	<b>Title</b>
EPI/GAG/91-1	Agenda
EPI/GAG/91/2	List of Participants
EPI/GAG/91/3	List of Documents
<b>Working Papers</b>	
EPI/GAG/91/WP.1	EPI Global Overview
EPI/GAG/91/WP.2	EPI Overview in the African Region
EPI/GAG/91/WP.3	EPI Overview in the American Region
EPI/GAG/91/WP.4	EPI Overview in the Eastern Mediterranean Region
EPI/GAG/91/WP.5	EPI Overview in the European Region
WP.5.1A	UK Country Report: Strategies to achieve 90% immunization coverage
WP.5.1B	UK Country Report: Implementation of MMR
WP.5.2	Turkey Country Report: neonatal tetanus elimination
WP.5.3	USSR Country Report: Polio eradication
WP.5.4	Sweden Country Report: Measles reduction
WP.5.5	France Country Report: Use of MMR
EPI/GAG/91/WP.6	EPI Overview in the South-East Asian Region
EPI/GAG/91/WP.7	EPI Overview in the Western Pacific Region
EPI/GAG/91/WP.8	EPI for the 1990s: A concept paper
EPI/GAG/91/WP.9	Achieving the 90% Immunization Coverage Target by the year 2000
EPI/GAG/91/WP.10	Progress on the Global Plan for neonatal tetanus elimination
EPI/GAG/91/WP.11	Progress on the Global Plan for Polio eradication
EPI/GAG/91/WP.12	Plan of action for Global Measles Control
EPI/GAG/91/WP.13	Guidelines for improvement of routine systems for Disease Surveillance, including EPI Target Diseases
EPI/GAG/91/WP.14	Update on local vaccine production

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- EPI/GAG/91/WP.15 Rubella and congenital rubella syndrome in developing countries
- EPI/GAG/91/WP.16 Control of Pertussis in the world
- EPI/GAG/91/WP.17 Status report on the Progress of micronutrient supplementation through the EPI
- EPI/GAG/91/WP.18 Update on developments in the Cold Chain and Logistics for Health
- EPI/GAG/91/WP.19 Report on the Progress of the Vaccine Independence Initiative

**Background Documents**

- WHO/EPI/GEN/91.4 EPI for the 1990s: First Phase: 1991-1994. Targeting diseases to strengthen national immunization programmes.
- WHO/EPI/GEN/91.8 Report of the 1991 Technical Consultative Meeting (Measles Section)
- Guidelines for EPI Programme Managers to reach the 1995 Measles Control Targets

# ANNEXE **C**

## TERMS OF REFERENCE OF THE EPI GLOBAL ADVISORY GROUP

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1. An appropriate constituted Advisory Group of outstanding consultants will be appointed to advise WHO on its Expanded Programme on Immunization. The Advisory Group will be assisted in its work by additional consultants, sub-committees and study panels for specific purposes as required.
2. The Advisory Group will:
  - advise the WHO Secretariat with respect to Programme priorities over the short, medium and long term;
  - promote the exchange of information concerning Programme strategies and tactics among participants functioning at country, regional and global levels; and
  - promote the understanding of, and support for, Programme goals among technical and political leaders.
3. Composition of the Group: Members of the Advisory Group will be appointed by the Director-General. It will consist of approximately 12 members, at least one from each Region being selected from a panel nominated by the Regional Offices. The others, selected "at large", will provide geographical and technical balance. Appointment will generally be for a period of one year with extensions arranged so as to provide for a turnover of approximately one third of the group each year. Re-appointment will not normally be considered before one year has lapsed from the previous termination date.
4. Meetings of the Advisory Group will be convened as required, but usually on an annual basis, and a report of each meeting will be prepared and circulated.

# ANNEXE **D**

## THE YAOUNDE DECLARATION ON THE ELIMINATION OF HEPATITIS B INFECTION

The time has come for action to eliminate one of the world's major diseases. Over 300 million people are chronically infected with hepatitis B virus and are at significant risk of death from liver cancer and cirrhosis. Each year over 1 million children are born who will eventually die from this infection.

It is now known that

Hepatitis B disease burden is comparable to the world's most serious diseases and exceeds those of diphtheria, pertussis, polio, cholera, rotavirus diarrhea, and AIDS.

Hepatitis B infection is a children's issue because it kills parents of young children, it is acquired in childhood, and it is prevented by vaccination near birth.

Hepatitis B vaccine, the first against a major human cancer, is among the best vaccines, and the possibility of combining it with other childhood vaccines will make its delivery even more effective.

Hepatitis B vaccine can be added directly to the Expanded Programme on Immunization (EPI) schedules; its administration with other EPI vaccines does not diminish their efficacy.

Hepatitis B vaccine's current cost makes it a very effective health intervention, and increased use will lead to even lower costs.

Therefore, the participants in the International Conference on the Control of Hepatitis B in Developing Countries held in Yaounde, Republic of Cameroon, October 7-9, 1991

State that Now is the Time for Action;

Call on Manufacturers to make hepatitis B vaccine available at an affordable price for developing countries; and

Call on the World and its Leaders to

Recognize the Significance, especially to children, of hepatitis B infection and its sequelae,

Recognize the Right of all children to protection from hepatitis B infection,

Support the development of hepatitis B vaccines combined with other childhood vaccines,

Establish a Global Fund for vaccine purchase and delivery, and

Provide hepatitis B vaccine to Children in all countries as part of EPI.