

REPORT OF THE EXPANDED PROGRAMME ON IMMUNIZATION
GLOBAL ADVISORY GROUP MEETING, 13-17 OCTOBER 1986, NEW DELHI

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1. INTRODUCTION

The Global Advisory Group of the Expanded Programme on Immunization (EPI) consists of 12 members. All WHO Regions are represented, six members being drawn from panels nominated by the Regional Offices and six members being selected either "at large" or from regional panels to provide geographical and technical balance. Representatives of collaborating agencies and donor sources are invited to Global Advisory Group Meetings as observers, and their views are considered in preparing the report.

The ninth meeting of the EPI Global Advisory Group took place from 13-17 October 1986 in New Delhi in the Regional Office for South East Asia. The Officers for the Group were:

Chairman: Professor I. Kaprio (Finland)
Rapporteur: Dr Mambu-Ma-Disu (Zaire)

Annexes 1-3 contain a list of participants, a list of documents used during the meeting and the terms of reference of the Global Advisory Group.

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The meeting was opened by Dr U Ko Ko, WHO Regional Director for South East Asia. He welcomed the Group to its second meeting in the Region after an interval of seven years. Much progress had been made both in relation to achieving health for all by the year 2000 and with respect to the EPI. But much also remains to be done. The guidance of the Group in suggesting ways of further strengthening the EPI would be most valuable.

Acceleration of immunization activities is occurring in almost all of the countries of the Region, generally in collaboration with a variety of organizations, including United Nations Agencies, bilateral development agencies and voluntary organizations. This underlines the need for the collaborating organizations to coordinate their own efforts, and to support governments according to policies which are jointly agreed. In this regard, Dr Ko Ko asked the Group to provide clear policy guidance with respect to the issues on the agenda for this meeting.

In closing, Dr Ko Ko complimented the EPI on the success which has been achieved so far, noting the contributions of governments, the support of the people and the support from many collaborating agencies.

On behalf of Dr Halfdan Mahler, Director General of WHO, Dr S. Litvinov, Assistant Director General, also welcomed the participants and expressed gratitude to the Regional Director for hosting the meeting.

In May 1986, the World Health Assembly had endorsed the conclusions and recommendations which had originally been made by the Global Advisory Group in November 1985. These conclusions and recommendations, together with the five point action programme endorsed by the World Health Assembly in 1982, provide the broad framework for programme efforts during coming years. It was hoped that the Global Advisory Group would help to provide more specific guidance to the programme in the context of these past recommendations during its deliberations this year.

Dr Litvinov extended a special welcome to the new members of the Group: Dr Foege from the United States (unable to attend), Dr Mambu-Ma-Disu from Zaire, Dr Masaharu from Japan and Dr Su from China. He also welcomed Professor Kaprio as the new Chairman.

Mr David Haxton, UNICEF Regional Director for South Central Asia, added UNICEF's welcome. He noted that immunization services had been provided in the Region for well over 100 years, yet coverage remained low and the toll from vaccine preventable diseases high. To remedy this, a social and political commitment had now been made to immunize every child and pregnant woman by 1990. This presents a formidable task.

UNICEF considers the integration of immunization with other maternal and child health services appropriate and cost-effective. Mr Haxton was happy to note that the Group would be considering ways of bringing together immunization and control of deficiencies in iodine and vitamin A. UNICEF experience suggested that the elements of primary health care are easier to promote together than to promote separately. Regular contact is needed at the community level between mothers and children on the one hand and health, nutrition and learning services on the other.

Immunization represents for UNICEF a core component of the strategy of child survival and development. Together with allied programmes, it signifies a new ethic for children, the elements of which are:

- priority for children in national planning,
- acceleration to provide universal coverage of children with basic services,
- demystification and sharing of technical knowledge relevant to child survival and development, and
- promotion of social learning processes and action through social communication.

Mr Michael Smith, Deputy Resident Representative for UNDP, India, brought greetings from Mr Draper, recently appointed as Administrator. UNDP considers the EPI a significant programme and is pleased to be a contributor to it. It supports the EPI at both global and regional levels. At global level, support has been provided for vaccine quality control and support will be provided in the near future for research in the area of applied vaccinology. UNDP, along with WHO and UNICEF, is a sponsor of IMPACT, an international initiative to prevent avoidable disability, which itself has been an active supporter of the EPI. UNDP also participates as a member of the Task Force on Child Survival with WHO, UNICEF, the World Bank and the Rockefeller Foundation. At Regional level, support is being provided through WHO for a number of national programmes. In the future, it is planned to offer this support as part of a primary health care package.

Professor Kaprio then assumed the chair, noting his personal pleasure in returning to this Region. Dr Mambu-Ma-Disu was nominated and confirmed as rapporteur, and the provisional agenda approved. The Group began its work with reviews of progress at global and regional level. Dr H. Nakajima, WHO Regional Director for the Western Pacific, participated in these reviews on the third day of the meeting and contributed to the discussion concerning EPI activities in the Region. The Group concluded with discussions of selected technical issues of global relevance.

2. CONCLUSIONS AND RECOMMENDATIONS

2.1 Global

"We are guilty of many errors and many faults
but our worst crime is abandoning the children,
neglecting the fountain of life.

Many of the things we need can wait.

The Child cannot.

Right now is the time his bones are being formed,
his blood is being made and his senses are being
developed.

To him we cannot answer "Tomorrow".

His name is "Today".

Gabriela Mistral
Nobel Prize-winning poet from Chile

The pulse of the EPI beats with this image in mind. The 1990 target date for providing immunization services for all children of the world draws ever nearer. And much remains to be done. Global immunization coverage figures remain under the 50% mark for BCG, DPT-3, OPV-3 and measles, and epidemics of the target diseases persist.

The Global Advisory Group of the Expanded Programme on Immunization met in New Delhi from 13 to 17 October 1986 to review the global status of the EPI in conjunction with detailed reports from each Region. It endorsed the following conclusions and recommendations:

2.1.1 The Actions proposed by the Group in 1985 and endorsed by the Thirty-ninth World Health Assembly (1986) to accelerate EPI progress are re-affirmed. These actions are summarized below along with the conclusions and recommendations of the Global Advisory Group.

- 1) "Promote the achievement of the 1990 immunization goal at national and international levels through collaboration among ministries, organizations and individuals in both the public and the private sectors".

Programmes committed to make substantial improvements before 1990 should concentrate on what they themselves can accomplish with the resources already at hand. Countries need to analyze existing resources and make sure they are using them to best advantage. Social mobilization efforts are a high priority, as human resources remain largely untapped. The joint WHO/UNICEF guide "Planning principles for accelerated immunization activities" remains the best single summary of social mobilization issues related to national immunization programmes.

Technical support is required from ministries of health, but political support is also needed, to sustain programmes on a permanent basis. In addition, support to accelerate and sustain immunization efforts may be solicited from other influential individuals and groups such as:

- religious leaders,
- women's organizations,
- educators,
- celebrities,
- associations of health professionals.

International support for the EPI remains essential. Many organizations, including United Nations agencies, bilateral development agencies and voluntary groups are now collaborating in the programme. UNICEF in particular can be complimented on its efforts. This support will be required until such time as recipient countries are fully self-sufficient.

2) "Adopt a mix of complementary strategies for programme acceleration".

Acceleration strategies should include well developed communications plans and should reinforce mechanisms for registering and following up children and women eligible for immunization. These have been almost universal features of programmes achieving high coverage rates. Such strategies may also include inviting successful managers from the private sector to join advisory committees constituted by the government and working at the community level through existing groups with reputations for effective action.

The involvement of the medical profession remains neglected in most programmes. Their support should be sought to promote immunization within their own practices and to promote immunization within the community as a whole. The knowledge of many physicians in the area of immunization needs to be updated, and this could be approached both through professional associations and through continuing educational programmes.

The theme of World Health Day, 7 April 1987, is "Immunization: a chance for every child". National programmes are urged to use this as an opportunity for acceleration activities. Such activities may encompass actual immunization events (such as a national day, week, or month) or may be used to reinforce routine services. National paediatric, medical, nursing and hospital associations are among the groups which should be encouraged to join in sponsoring the events planned in conjunction with World Health Day.

Programme acceleration can be stimulated through meetings of national programme managers. All WHO Regions should be encouraged to have at least one such meeting on an annual basis.

3) "Ensure that rapid increases in coverage can be sustained through mechanisms which strengthen the delivery of other primary health care interventions".

Sound planning and management remain prerequisites for accelerating and sustaining immunization services and for assuring that such services strengthen the health infrastructure. Many programmes still need to reinforce the planning process at peripheral level. This "implementation planning" consists of detailing the needs for transport, vaccines, supplies and equipment for each proposed vaccine delivery point and matching such needs with the resources available from district and central levels.

National programmes are urged to develop effective monitoring and evaluation systems, as these provide one of the best guarantees of sustainability. Approaches which fail, or succeed initially but then falter, can be quickly identified through changes in immunization coverage and disease incidence.

Evaluating the social aspects of immunization programmes presents special challenges. UNICEF has developed some approaches which are now being tried in "rapid assessments" and programme reviews. The fact that social factors may be more difficult to quantify and hence, to evaluate, should not detract from the necessity of regularly reviewing this fundamental aspect of national programmes. Monitoring over a several-year period is likely to be needed to fully assess the contributions of social actions to immunization services and to the general development of primary health care.

4) "Provide immunization at every contact point".

Immunization coverage rates can be expected to increase dramatically if every contact with the health services is used as an opportunity for immunization. Paediatric associations, and hospital associations and hospital review committees should be approached to help increase the number of facilities offering immunization.

Susceptible persons seeking care from facilities which offer immunization should be identified and immunized. Operational research carried out in three countries has demonstrated that a significant proportion of eligible children is being turned away for inappropriate reasons. Additional studies of this nature in other countries can be instrumental in reforming current practices.

Further emphasis should be placed on immunizing children as early in life as possible. In most developing countries, BCG is offered at birth. Where poliomyelitis remains endemic, a dose of trivalent oral poliomyelitis vaccine (OPV) should be administered at birth or at the first subsequent contact. DPT immunization should be given from the age of 6 weeks.

5) "Reduce drop-out rates between first and last immunizations".

In many programmes, the reasons for high drop-out rates are perfectly apparent. Systems for identifying and following up eligibles are not in place. Unclean or overcrowded facilities, erratic scheduling of services, long distances between services and homes, long waiting times, and poor communication between mothers and health staff discourage both initial utilization and return visits. Better management alone may not solve these problems. Social mobilization may also be necessary to increase resources and motivation within the health sector.

Additional operational research to identify the specific causes of high drop-out rates should be encouraged. Particularly needed are studies of the knowledge, attitudes and practices of mothers with respect to immunization. This research should be undertaken in collaboration with social scientists.

6) "Improve immunization services to the disadvantaged in urban areas".

Countries may consider the following actions in improving immunization services in urban areas:

- define the problem: analyze immunization coverage and disease incidence to pinpoint neighbourhoods and population groups at high risk;
- ensure that existing health facilities provide immunization services;
- improve the quantity and quality of outreach services;
- promote the formation of urban immunization committees or include immunization among the mandates of existing committees to assure the necessary political support for improving services;
- improve the identification and follow up of persons requiring immunization services. Use "channelling", "tickler files" and community-wide registration of pregnant women and newborns;

- enlist the active participation of private physicians, who are an important but neglected resource in urban areas;
- use urban programme reviews patterned after national programme reviews, to highlight problems and develop consensus regarding solutions;
- use one (or more) urban health facilities as a sentinel surveillance site for one (or more) of the target diseases. Consider establishing at least one such site in each capital city before the end of 1987; and
- consider introducing periodic mass immunization days, weeks or months to supplement routine services in cities where coverage is inadequate.

7) "Increase priority for the control of poliomyelitis, measles and neonatal tetanus".

The time has come for many national programmes to shift the primary concern of the EPI from immunization coverage to disease control.

Those countries or groups of countries in which poliomyelitis elimination appears feasible should be encouraged to adopt this as a goal. Ongoing surveillance of suspected cases with appropriate laboratory support should be encouraged in all countries currently reporting zero cases. Reports on progress in all Regions should become part of the regular reports to the Global Advisory Group meeting.

All countries can reduce measles morbidity and mortality to low levels, although measles elimination remains at present beyond the reach of most. In addition to ensuring high levels of coverage, national measles control efforts should include:

- Alerting professionals and the public to the dangers of measles in order to enlist their commitment to measles control;
- Investigating measles outbreaks in immunized areas in order to document and remedy programme failures.

Neonatal tetanus should be made reportable as a separate entity in all countries. Specific neonatal tetanus surveys should be considered in countries reporting an infant mortality rate of over 50 per 1 000 live births or having more than 20% of births attended by untrained persons. Countries in which cases are recognized should develop a specific strategy for reducing the incidence below 1 case per 1 000 live births by 1990. If national incidence is already below this level, a goal of elimination by 1990 should be adopted.

Strategies should cover a mix of approaches which include:

- efforts to immunize all women of childbearing age (with special emphasis on pregnant women and women known to belong to high risk groups);
- training and supervision of birth attendants; and
- investigation of cases to determine what action could have prevented them.

Mass tetanus immunization programmes of women of child-bearing age should be considered in high incidence areas where there are otherwise limited opportunities for receiving immunization. These programmes should be planned so as to address the continuing need for providing immunization to women entering the child-bearing years and for providing reinforcing doses as necessary. Tetanus should be included among the antigens administered during campaign activities.

2.1.2 Disease surveillance.

Effective disease control requires effective disease surveillance. Surveillance is currently one of the weakest elements of the EPI and should receive priority attention at all levels.

Countries are urged to:

- adopt standard case definitions for the EPI target diseases;
- strengthen routine reporting of cases, with special emphasis on poliomyelitis, measles and neonatal tetanus (childhood tuberculosis, and pertussis may also be appropriate in some programmes);
- establish supplemental mechanisms for monitoring trends of the target diseases when routine reporting remains too slow or too insensitive;
- provide regular feedback to those originating the data; and
- take appropriate action on the basis of the data received, including investigation and control of outbreaks and revision of programme strategies.

Regions are urged to develop plans to further strengthen national and regional surveillance systems.

A system of local area monitoring has been promoted at the global level in recent years. It entails obtaining trend data on target disease incidence from selected facilities in the major cities of the most populous developing countries. Such an approach can be useful at national and regional level to highlight the problems encountered in developing effective services in urban areas, and to provide a rapid indication of programme impact. Its potential at global level should be further evaluated.

2.1.3 Immunization and AIDS

In countries where human immunodeficiency virus (HIV) infection is considered a problem, individuals should be immunized with the EPI antigens according to standard schedules. This also applies to individuals with asymptomatic HIV infection. Unimmunized individuals with clinical (symptomatic) AIDS in countries where the EPI target diseases remain serious risks should not receive BCG, but should receive the other vaccines (Table 1).

In general live vaccines are not given to immunocompromized individuals, but in developing countries, the risk of measles and poliomyelitis in unimmunized infants is high and the risk from these vaccines, even in the presence of symptomatic HIV infection, appears to be low.

Table 1

Recommendations on use of EPI antigens in HIV-infected individuals in countries where the EPI target diseases remain important causes of morbidity.

	Vaccine	Asymptomatic	Clinical AIDS
Infants	DPT	Yes	Yes
	BCG	Yes	No
	OPV	Yes	Yes
	IPV	Yes	Yes
	Measles	Yes	Yes
Women	Tetanus toxoid	Yes	Yes

2.1.4 Injection equipment and sterilization practices

The WHO/UNICEF Joint Guidelines for the selection of injection equipment for the EPI are commended to the attention of national programme managers. The following recommendations contained in the guidelines are particularly important:

- a single sterile needle and a single sterile syringe should be used with each injection;
- reusable needles and syringes are recommended for use in developing countries. They should be steam sterilized between uses. Boiling is an acceptable alternative procedure until steam sterilization is available. The number of reusable needles and syringes, and sterilizers, should be adequate to ensure that operations are not impeded by sterilization requirements. The low cost of the new reusable plastic syringes now makes this possible;
- disposable needles and syringes should only be used if it can be assured that they will actually be destroyed after a single use. If this cannot be assured, reusables should be used with scrupulous attention to sterilization;
- disease transmission by use of jet injectors is theoretically possible and has been documented in humans in a single situation. Until further studies clarify the risks of disease transmission with different types of jet injectors, their use should be restricted to special circumstances where the use of needles and syringes is not feasible because of the large numbers of persons to be immunized within a short period of time.

2.1.5 Incorporation of additional vaccines in the EPI

National immunization programmes should continue to review the appropriateness of including other vaccines as new or improved vaccines become available at an affordable cost. Measles-mumps-rubella vaccine (MMR) is already in routine use in a number of industrialized countries, and its use in most industrialized countries would seem appropriate. Rubella vaccine should only be recommended as a childhood immunization when a high coverage can be assured, however, and developing countries will need to review the appropriateness of using rubella and mumps vaccines within the EPI.

A new acellular pertussis vaccine developed in Japan has been approved for manufacturing. It is now widely used in Japan and is undergoing extensive testing elsewhere. Indications are that it is equally effective and causes fewer local and general reactions when compared with the presently used whole-cell vaccine.

Pertussis remains an important cause of morbidity and mortality, and full use should be made of existing whole-cell vaccines until such time as improved vaccines are available at affordable cost.

Yellow fever is a major epidemic threat in Africa. Its severity is reflected by a case-fatality ratio of 25%. Yellow fever vaccine is safe and effective and is already included in some West African immunization programmes. Countries falling within the African endemic-epidemic belt should consider its incorporation within the EPI.

Hepatitis B vaccine should be considered an important priority in countries with carrier rates of hepatitis B surface antigen above 10%. The vaccine is still expensive, however, and its widespread use should be based on epidemiological and serological studies indicating that the benefits of immunization outweigh the costs. Efforts to reduce the costs of this vaccine should be promoted.

2.1.6 Prevention of iodine and vitamin A deficiency

The EPI should continuously explore opportunities for promoting other interventions which have the potential to reduce morbidity and mortality, especially among children and women of child-bearing age. In selected areas of the world, the provision of iodine and/or vitamin A represent such interventions. EPI workers are encouraged to investigate the degree to which immunization delivery systems can be used to complement national nutrition programmes to provide iodine and vitamin A to populations at risk.

2.1.7 Cold chain monitors

Cold chain time/temperature monitor cards should be used routinely at all levels. Protocols describing ways in which these monitors can be used in routine supervision and in programme reviews should be developed at regional and global levels.

2.1.8 Research and Development

Investments in research and development are essential to assure that coverage and disease reduction targets are reached, and they should be increased. At national level, efforts should be made to involve collaborating institutions such as medical faculties and epidemiology training units in conducting research to solve operational problems.

At regional and global levels, efforts should focus on collaborating with other agencies and organizations which support research, on providing research protocols to national managers for problems of common interest and on providing specific financial support for investigation of issues of the highest priority.

Areas of particular interest include:

- vaccine delivery, including studies of missed immunization opportunities and reasons for non-utilization of immunization services;
- prevailing levels of knowledge, attitudes and practices relating to health and the prevention of disease;
- logistics (cold chain, needles and syringes, sterilization, the development of a single-dose self-destructing injection device and the development of potency indicators usable on individual vials of vaccine);
- vaccine development, particularly with respect to improving heat stability and reducing the number of doses required and studying the possibilities of administering newly developed vaccines with the EPI antigens.

2.1.9 Measles immunization and childhood mortality

A well designed retrospective study was recently completed in Matlab, Bangladesh. It documented a 38% reduction in mortality in children aged 10-60 months as a result of measles immunization. Further studies of this nature are encouraged.

2.2 The EPI in the South-east Asia Region

The Global Advisory Group took note of the Regional overview and the presentations made by six countries in the SEA Region (Bangladesh, India, Indonesia, Nepal, Sri Lanka and Thailand). Significant progress has been made in many countries of the Region since the 1979 Meeting of the Group in New Delhi. Sri Lanka and Thailand have recorded dramatic reductions in the incidence of poliomyelitis and diphtheria, all the EPI diseases are at low levels in the DPR Korea and Mongolia, and national acceleration activities are being implemented in some countries.

Measles vaccine has now been introduced in all countries. The vaccine has been rapidly accepted into the EPI in Sri Lanka, where recent surveys showed a coverage of more than 50 per cent only one year after the antigen was introduced. This indicates that new antigens can be rapidly and successfully introduced into well developed programmes.

The close collaboration occurring between Member Countries in the Region, WHO, UNICEF, and bilateral agencies in developing the EPI is noted as a very positive factor. Joint Government/WHO/UNICEF plans of action have been prepared in Bangladesh and Burma.

The diversity of the stages of programme development and the size of eligible populations are striking. Some countries have already established well functioning immunization programmes, achieving high levels of coverage and documented reduction in incidence of some EPI target diseases. Others have achieved medium levels of coverage and still require further development of the immunization infrastructure or geographical expansion of the programme. A third distinct group has only achieved low coverage and requires rapid acceleration of activities to achieve the EPI goal by 1990.

Different programme strategies need to be developed for each of these three groups. High coverage countries need to maintain or increase coverage and improve monitoring of programme impact. Medium coverage countries should review their programme strategies and accelerate programme operations to improve immunization coverage and disease surveillance. Although all countries need to enlist political commitment and create demand through social mobilization, low coverage countries especially need to focus on these methods and also identify and remove programme constraints.

Overall, the immunization coverage in the Region, though increasing, remains low. Only 5 per cent of infants receive measles immunization, 30 per cent receive a third dose of OPV, 32 per cent receive BCG, and 37 per cent receive a third dose of DPT. Only 31 per cent of pregnant women are fully immunized with tetanus toxoid. Meeting global goals will be critically dependent on SEAR's own progress, since this Region has more newborns than any other Region.

Increasing immunization coverage levels to a point where significant reductions in morbidity and mortality can be achieved and sustained remains a formidable challenge. It is important that the sustainability of programmes be considered from the initial planning of acceleration activities.

The Group endorses the recommendations of the 1985 Regional EPI National Programme Managers Consultative Meeting (Annex 5) and emphasizes the following:

- (1) National Immunization Plans of Action should be reviewed and, if necessary, updated to reflect the programme acceleration required to meet the goal of Universal Child Immunization. In addition, plans should be developed at local levels taking into consideration the diversity of resources, constraints and other relevant conditions in each area.
- (2) Social mobilization should be given high priority to create community awareness of, demand for, and participation in, immunization programmes. Such mobilization should be designed to help strengthen the health infrastructure and other components of Primary Health Care.
- (3) Countries should review and, if necessary, revise the age of initial immunization in their national schedules in light of the recommendations of the 1984 Global Advisory Group. BCG and an extra OPV dose should be offered at birth or first contact. The series of three DPT and OPV doses should be started at 6 weeks of age.
- (4) To protect infants in the neonatal period, all women in the reproductive age should be immunized with tetanus toxoid (TT). If a country finds that it is not yet possible to introduce TT to this large target group, then TT should be given to pregnant women and the feasibility of providing TT to all unimmunized or partially immunized mothers who bring their children for care should be explored. Countries should also consider offering TT to students.
- (5) All countries should consider enumeration of eligibles using locally available resource persons. Registers of eligibles are important in identifying and following up infants and women who do not present for immunization or who have not completed immunizations.

- (6) Immunization data should be reported for the age group of less than 12 months and for the age group of 12 or more months.
- (7) EPI should utilize and improve data generated from the routine disease surveillance system. Sentinel surveillance systems may be necessary to generate more reliable data on EPI target disease trends and programme impact. Sentinel surveillance can also complement routine reporting systems by providing additional information such as age, immunization status, residence in a defined catchment area, disease rates and seasonal patterns. Countries and the Regional Office should work together to establish special sentinel sites in accordance with the concept of Local Area Monitoring to provide trend assessment of EPI target diseases.
- (8) The establishment of regional disease reduction targets for neonatal tetanus and paralytic poliomyelitis is commended. Those countries that have not yet established disease reduction targets should set such targets by 1988 for the period 1990-1995. Regional disease reduction targets should be monitored and revised, as necessary, at future Regional EPI meetings.
- (9) The Group took note of the usefulness of national newsletters and encouraged issuing of periodic EPI newsletters or bulletins to provide feedback on programme monitoring and evaluation indicators. Such newsletters and bulletins can serve to publicize the importance of the target diseases in terms of their high costs in morbidity and mortality. Examples of decreases in disease incidence as evidence of programme impact should also be stressed to encourage health workers involved in immunization activities. A means for periodic exchange of EPI Information should be considered at the regional level.
- (10) Use of computerized EPI information systems for immunization coverage, target disease incidence and other important programme monitoring indicators should be encouraged at country level. The Regional Office should assist in this effort by developing software that can be adapted to the programme needs in countries.
- (11) National programme evaluations should be performed in countries which have not yet conducted such evaluations. Follow-up evaluations should generally be conducted every 3 to 5 years to assess and refine accelerated immunization strategies. Monitoring of the implementation of the recommendations from national programme evaluations should be done on an annual or semi-annual basis. Countries with large populations should be encouraged to undertake programme reviews at sub-national levels.
- (12) Training at all levels for EPI should be strengthened by preparing locally relevant training and health education materials. EPI should be included as a topic in all health, and health related training programmes.

3. SUMMARY OF THE GLOBAL AND REGIONAL PROGRAMMES

3.1 GLOBAL OVERVIEW

A comprehensive review of EPI progress was presented by the Director-General to the World Health Assembly in May 1986 (document A39/15). In resolution WHA39.30 (Annex 4), the Assembly, inter alia:

- affirmed that the EPI goal remains a global priority and represents a milestone toward achieving health for all by the year 2000;
- warned that the goal will not be achieved without continuing acceleration of national programmes; and
- urged Member States to pursue vigorously the recommendations for action contained in the Director-General's report and to commit themselves fully to achieving the 1990 immunization goal as part of their strategies for achieving health for all by the year 200 through primary health care.

The Director-General's report remains the best current overview of programme progress. Data from that report are updated in Annex 6 which provides estimates of:

- immunization coverage, by country, for the 25 largest developing countries and in total for the remaining developing countries, the industrialized countries and the world (Table 1);
- immunization coverage by Region (Figure 1);
- reported incidence rates of measles, tetanus and poliomyelitis, 1974-1985, (Figure 2);
- annual estimated deaths due to the EPI target diseases (Table 2);
- estimated cases and/or deaths prevented from neonatal tetanus, pertussis, measles and poliomyelitis (Table 3).

The overview presented to the Global Advisory Group focussed on the recommendations for acceleration which were endorsed by the World Health Assembly in 1986. It also contained recommendations pertaining to:

- immunization of children infected with human immunodeficiency virus (HIV),
- the selection of injection equipment for the EPI,
- EPI collaboration in the prevention of iodine and vitamin A deficiencies,
- inclusion of other antigens in the EPI.

As most of the material contained in the global overview, after modification in the light of the discussions of the Global Advisory Group, has now been incorporated within the Group's conclusions and recommendations, it will not be repeated in this section of the report.

3.2 AFRICAN REGION

Adoption of Resolution AF/RC35/R9 on African Immunization Year (AIY) by the 35th Regional Committee in Lusaka plays a significant role in promoting the EPI in the African Region. National authorities, international and non-governmental organizations, bilateral development agencies, and associations are all contributing to the implementation of AIY-1986.

In 24 countries of the Region an accelerated EPI was launched, often in the presence of the President, Head of State or the Minister of Health. In many cases the launching ceremony has been linked with World Health Day.

3.2.1 Promote EPI within the context of primary health care (PHC)

At the 35th session of the Regional Committee some delegations expressed concern that the African Immunization Year approach may generate short-term mass immunization campaigns and independent vertical structures based predominantly on mobile immunization teams. As a result many national programmes adopted the AIY strategy as an instrument to increase community awareness for EPI and strengthen the general health infrastructure.

Action plans for the implementation of programme acceleration in the Region are summarized in Table 2.

During 1985-1986 special attention was paid to community mobilization. Among approaches used were organization of special immunization days or weeks, strengthening of routine immunization activities, carrying out immunization rounds or pulses and accelerating immunization in large urban settings.

In several countries the EPI also promotes immunizations to prevent yellow fever and cerebrospinal meningitis (Table 3). Hepatitis B vaccine is also being introduced in one country.

3.2.2 Invest adequate human resources in EPI

Three intercountry courses were organized by AFRO for mid-level personnel and cold chain technicians in both 1985 and 1986. The national courses reported to AFRO include:

1985 - 20 courses, 527 participants,
1986 - 25 courses, 598 participants.

Since 1977 more than 26 000 personnel from all levels of the health services have been trained in EPI.

Two intercountry meetings in English and French were organized for EPI Programme Managers in 1985-1986 and one is in preparation for Portuguese speaking countries. The objective of these meetings was to discuss ways and means of implementing the Regional Committee's recommendations on the African Immunization Year. Several countries organized similar meetings for the programme managers at state or regional levels.

Table 2
EPI acceleration in the African Region

Country	Accelerated EPI launched	Committee for acceleration established	EPI acceleration action plan prepared
Algeria			+(*)
Angola	+	+	+
Benin	planned - 1986	+	+
Botswana	+		
Burkina Faso	+	+	+
Burundi	+		+
Cameroon	+	+	+
Cap Verde			
Centr. Afr. Rep.			+
Chad		+	
Comoros	+		+
Congo	planned - 1986	+	+
Equat. Guinea			+
Ethiopia	+		+
Gabon	planned - 1986		+
Gambia			planned - 1986
Ghana	+	+	+
Guinea	+	+	+
Guinea-Bissau	planned - 1986	+	+
Ivory Coast	planned - 1986		+
Kenya	+		
Lesotho	+	+	
Liberia	+		
Madagascar	+	+	+
Malawi	+	+	+(*)
Mali			+
Mauritania			
Mauritius			
Mozambique	+		+(*)
Namibia			
Niger			
Nigeria	+	+	+
Reunion			
Rwanda			
Sao Tome and and Principe			+
Senegal	+	+	+(*)
Seychelles			
Sierra Leone	+	+	+
St Helena			
Swaziland	+	+	in preparation
Tanzania	+	+	+
Togo			+
Uganda	+	+	+(*)
Zaire			+
Zambia	+	+	+
Zimbabwe		+	+

(*) - Not confirmed

Table.3
AFR countries using additional vaccines

Country	Vaccine
Burkina Faso	Yellow Fever
Chad	Yellow Fever
Centr.Afr.Rep.	Yellow Fever
Gambia	Yellow Fever
	Hepatitis B
Ghana	Yellow Fever
Ivory Coast	Yellow Fever
	Meningitis
Niger	Yellow Fever
	Meningitis
Nigeria	Yellow Fever
	Meningitis
Senegal	Yellow Fever

3.2.3 Invest adequate financial resources in EPI

Cuts in the regular budget caused certain difficulties in carrying out intercountry activities in the beginning of 1986.

The WHO country allocations have increased for the 1986-87 biennium, as Member States embarked on AIY with a variety of activities requiring additional financial inputs.

3.2.4 Ensure that programmes are continuously evaluated and adapted so as to achieve high immunization coverage and maximum reduction in target disease deaths and cases.

During 1985 and 1986 - 15 and 18 countries respectively have undertaken EPI programme reviews/evaluations. These were national activities with participation in most cases of international personnel from WHO, UNICEF, SCF, Rotary International and/or USAID. Cold chain reviews were also undertaken in 13 countries.

A report evaluating the progress towards implementation of African Immunization Year was submitted to the Regional Programme Committee. In 1985, only 20% of target population in the Region was fully immunized, as compared with a target of 75% by 1990. Assuming that the programme started in 1974 with an immunization coverage of 1%, the average annual increase in coverage must have been in the order of 2% in the period 1974-1984. With such a low rate of increase, it would follow that the 1990 target could be achieved only after the year 2000. This was not acceptable to the member states. Therefore, resolution AF/RC35/R9 called for acceleration in order to substantially increase the coverage within a short time interval. Considering the mobilization potential of AIY it is expected that by 1987-1988 the coverage will increase to 50% in the Region.

3.2.5 Pursue research efforts as part of programme operations

In Uganda, by using a new survey methodology by which the nearest households to existing health facilities (within 1 km) were covered, it was possible to establish that despite good access to health facilities, under-utilization of PHC services occurred, resulting in low immunization coverage and high mortality rates. Instrument sterilization studies were conducted in Malawi and Zaire, and a research project in Zaire involved comparison of different methods of immunization coverage surveys.

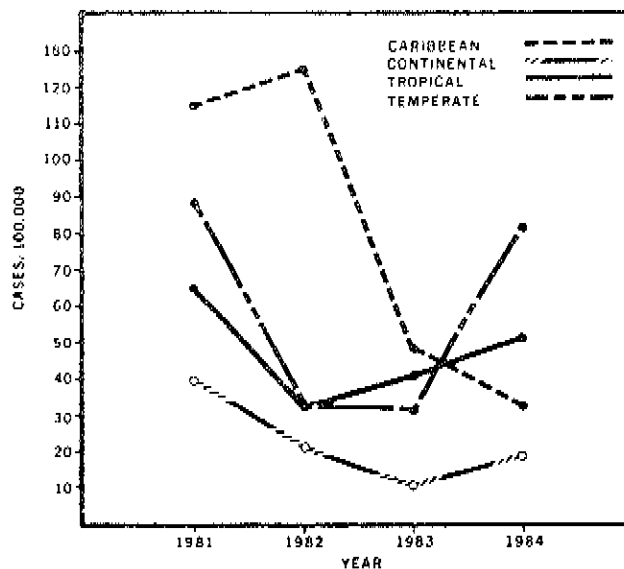
3.3 AMERICAN REGION

The Expanded Programme on Immunization (EPI) has made major advances since it was launched in the Region of the Americas in 1977. Immunization coverage has approximately doubled between 1977 and 1984, rising from 25-30% to over 60% in children under one year of age. As a consequence, incidence rates of the six EPI diseases have been greatly reduced. These achievements have been particularly dramatic for poliomyelitis, and have led to the decision to eradicate the indigenous transmission of wild polio virus from the American hemisphere by 1990.

3.3.1 Status of the EPI Diseases in the Region

Most countries of the Caribbean are achieving high immunization coverages in children under one year of age and have reduced morbidity and mortality from the EPI diseases to very low levels. Measles continues to be the most frequently reported of the vaccine preventable diseases in almost all countries. Only in the Caribbean sub-region has there been a marked decline in measles incidence over this period (Figure 1).

Figure 1
Measles in the American Region, by Sub-region, 1981-1984*



* Excludes USA and Canada

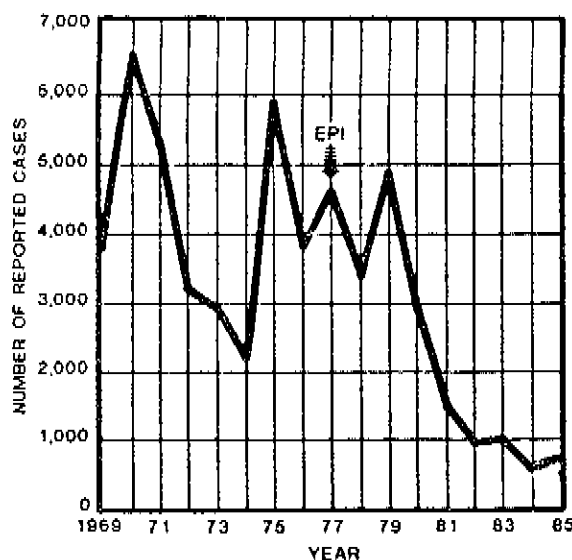
Because of weak surveillance systems in many countries, the mortality from neonatal tetanus is not known. Provisional data for whooping cough and diphtheria in 1985 show that tropical South America reported well over half of the cases in the Region.

There has been a continuing downward trend in poliomyelitis since the EPI was established in 1977 (Figure 2). For 1985, 791 cases had been reported from 15 countries in Latin America and the Caribbean, as compared to 615 cases reported from 13 countries in 1984. For the first 40 weeks of 1986, 802 cases have been reported from ten countries in the Region, as compared to 517 cases from eleven countries for the same period in 1985. This increase is probably due to more active disease surveillance, which has resulted in a greater proportion of cases being reported to health authorities.

To monitor poliomyelitis activity at the regional level, PAHO requested in January 1986 that each Member Country send a telex each Monday to PAHO indicating the number of poliomyelitis cases reported the previous epidemiological week. Every Wednesday, PAHO sends a telex to each country advising the cumulative number of cases reported, by country, through the most recent reporting period, and the cumulative number of cases reported for the same period the previous year.

Countries with suspected poliomyelitis cases are developing mechanisms to assure immediate case investigation and the implementation of control measures. The regional level is also prepared to assist countries in all phases of polio investigation and control.

Figure 2
Annual number of reported cases of poliomyelitis,
American Region, 1969-1985



3.3.2 Regional EPI Managers' Meetings

To further strengthen the EPI and improve polio eradication activities, EPI programme managers from the English-speaking Caribbean and from Latin America met during November 1985 and May 1986, respectively. The objective was to review and assess progress to date and to exchange ideas on how to correct problems impeding the national programmes.

In order to reach the goal of regional elimination of wild polio virus and assure that immunization programmes are sustainable, each country prepared a draft plan of action to be discussed at the EPI managers' meetings. The plans for the 1985-1986 meetings focussed on improvements in the health infrastructure, development of human resources, target setting for immunization coverage and disease reduction, formulation of strategies for improving immunization coverage and preparing budgets.

3.3.3 Programme Acceleration

In order to promote the achievement of the 1990 immunization goals various countries in the Region are using different strategies to increase immunization coverage.

In various forms national immunization days were held in Mexico, Paraguay, Peru, Ecuador, Belize and Guatemala. In these countries, detailed plans were prepared for every level of the health system. Organizing committees were established to carry out and follow up preparations for vaccine delivery, procurement of cold chain and related supplies for administering vaccines, training of health workers and volunteers and creation of temporary immunization posts. One of the key elements of all the accelerated efforts has been the use of mass publicity and the mobilization of the populations of these countries.

3.3.4 Review of National Laboratories

A major recommendation of the first Technical Advisory Group meeting was to review the national laboratories in the Region in order to assess their strengths and weaknesses, particularly with regard to support for the polio eradication effort. These evaluations have been carried out in: Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Peru, Trinidad (CAREC), and Venezuela.

In accordance with the Polio Plan of Action, all countries should have access to laboratory facilities for poliomyelitis studies. The laboratory review showed that polio virus isolation and identification methods are fairly well standardized, but methods for polio virus serology and vaccine titration are less standardized. Problems with collection and shipment of specimens, with tissue cultures and with the lack of supplies and equipment are significant at most laboratories.

3.3.5 Technical Manual on Poliomyelitis Eradication

Following the Directing Council's approval of the Polio Plan of Action in September 1986, work began on a draft Technical Manual for the Eradication of Indigenous Transmission of Wild Polio Virus in the Americas. The manual is designed to aid national authorities and programme managers in the preparation of national manuals or guidelines for polio eradication.

3.3.6 Surveillance

In addition to the draft manual referred to above, a series of guidelines have been developed to maximize the sensitivity and specificity of poliomyelitis surveillance in the Americas. These guidelines are necessary in order to implement control measures in a timely and efficient manner and to monitor more rigorously progress towards the eradication of wild polio virus transmission by 1990. These guidelines, prepared with the collaboration of the Centers for Disease Control, Atlanta, are presently being implemented in several countries of the Region.

The main components of the system are the identification and training of personnel at state/provincial level to be responsible for surveillance activities; the establishment of adequate OPV coverage levels in populations at risk for each community; uniform case and outbreak investigation; appropriate record keeping systems and containment activities.

3.3.7 Training

Schools of public health continue to be strong participants in EPI training activities, which are now aimed primarily at surveillance. Materials for an EPI surveillance course were originally produced by the school of public health of Rio de Janeiro. Further cooperation is now taking place with the schools of public health of Buenos Aires and Mexico.

3.3.8 Technical Advisory Group (TAG) Meeting

The second and third meetings of the Technical Advisory Group on EPI and Polio Eradication in the Americas were held in Mexico City, 15-17 January 1986 and in Brasilia, 10-12 September 1986, respectively.

The major recommendations of the TAG members included revised definitions for suspected, probable and confirmed cases of poliomyelitis; emphasis on sustaining at least 80% immunization coverage in children under one, not only on the national level, but in each geopolitical unit; and the need for laboratory investigation of all cases diagnosed as Guillain-Barre syndrome. The group also made recommendations regarding containment activities, improved case finding and case investigation, laboratory support and national management.

3.3.9 Evaluation

Eight countries carried out evaluations of their programmes in 1985, three of them for the first time (Mexico, Paraguay and Suriname). Joint EPI/CDD evaluations were carried out in Ecuador in September 1985, and in Suriname in November-December 1985.

3.4 EASTERN MEDITERRANEAN REGION

The three main features in this Region during the past year have been:

- a clearer definition of those member states where progress towards universal child immunization was such that, without additional activity, the 1990 target was unlikely to be reached;
- the development and implementation of acceleration policies aimed at increasing immunization activity, particularly in the above countries; and
- improved levels of coordination between agencies supporting EPI in the Region.

3.4.1 Promotion of EPI within the context of primary health care (PHC)

The acceleration of immunization activities, involving the use of many resources, intensive media coverage, increased demands on staff time, with much financial support, clearly poses a potential threat to the policy of broadly based PHC development. The belief, within EMRO, is that involvement of leading political figures, popular personalities and the media in EPI, with greater cooperation between all concerned ministries, will give all health matters, especially preventive health measures, a higher level of visibility to decision makers, financial controllers and the public itself.

Acceleration activities will undoubtedly lead to higher rates of face to face contact between health staff and the public, and to increased attendance at health units. These opportunities for health education, with discussions on other health interventions need to be taken, and this action forms part of the policy basis for all immunization acceleration in EMR.

Afghanistan, Djibouti, Egypt, Iran, Iraq, Oman, Pakistan, Somalia, Sudan, and Syria have already carried out acceleration activities.

In Somalia, Sudan and Iraq, presently available experience suggests that, after a well planned acceleration campaign, followed by well maintained services, immunization levels have remained well above those existing before the campaign. However, in Pakistan, staffing levels were reduced in the most populous area after an effective accelerated health programme and this resulted in a marked drop in coverage levels. Steps have now been taken to re-establish former staff levels. Early results from programmes undertaking acceleration activities suggest that drop out rates following campaigns involving intensive public information through the mass media are markedly lower than during routine programmes.

3.4.2 Invest adequate human resources in EPI

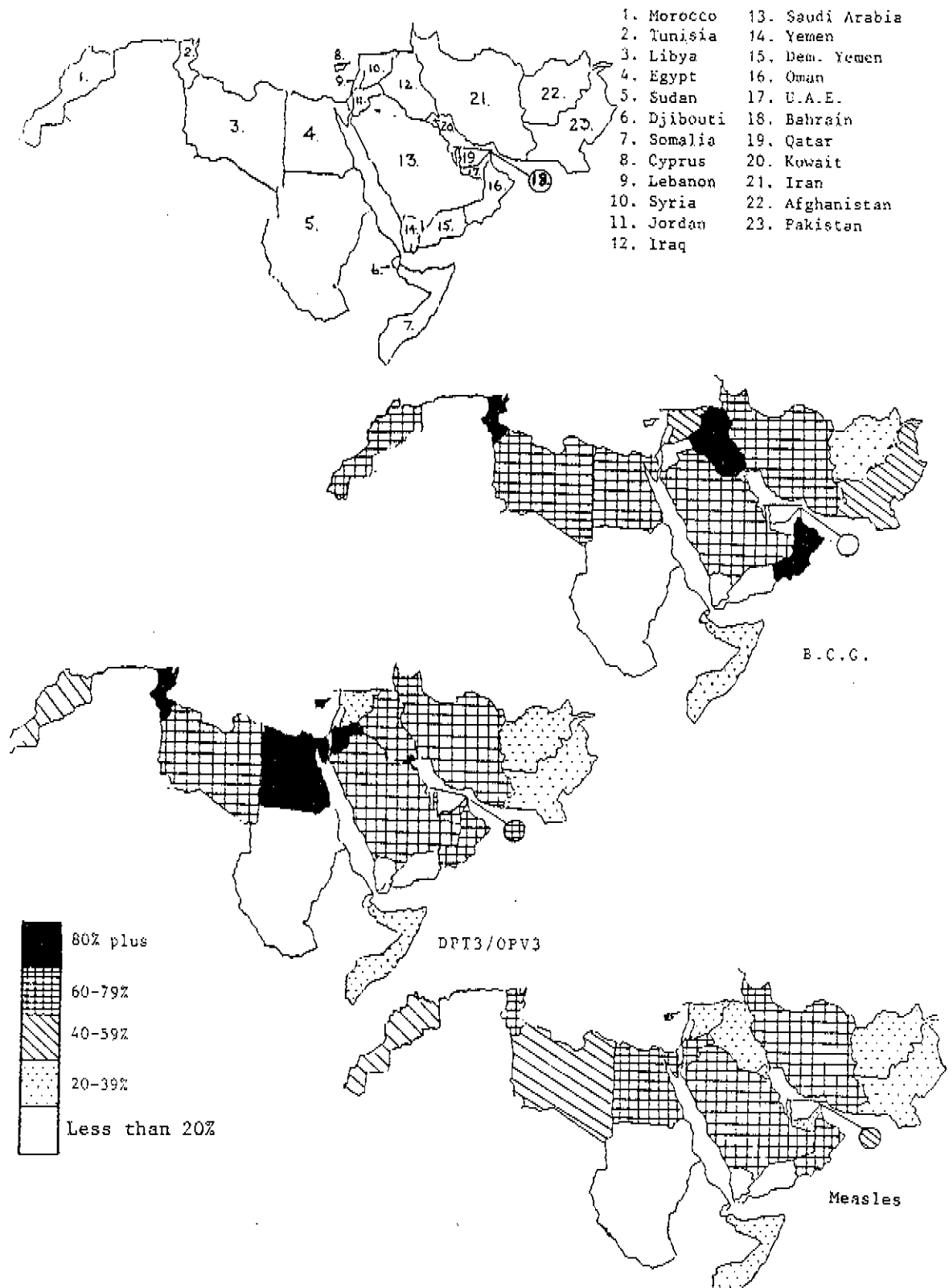
22 countries of the Region now have a full time or part-time EPI manager and all countries have a focal point responsible for immunization activities. Most of these staff have received senior level EPI training in planning and management.

WHO provides 2 medical officers and a cold chain engineer at the Regional Office, 4 medical Officers, 4 international and 7 national technical officers at the country level.

Mid-level managers have been identified in all countries and appropriate training given to over 1500 health staff. Increasingly, courses at the national level are combined with training for other interventions, notably the supervisory skills course of CDD.

Within the countries of the Region, emphasis in training has moved from senior and mid-level training towards ensuring that peripheral health workers have skills appropriate for their EPI responsibility, whether as part of their normal duties or as part of an acceleration activity. Increased attention at the intercountry level has been paid to developing the technical skills required for cold chain maintenance and repair, and to developing skills for in-country training for all levels of the EPI.

Figure 3
Reported coverage levels, EMR, DPT-3/OPV-3, measles and BCG,
data available at September 1986



3.4.3 Invest adequate financial resources in EPI

During the past two years increased levels of external funding have become available for immunization in member countries. Such increases are expected to continue for the next four years. While the financial needs of EPI in the Region are met mainly from national resources, much additional funding has been provided, particularly by UNICEF, USAID and AGFUND. A part of the Voluntary Funds available to WHO is also utilized for support of regional EPI activities.

Other UN agencies have made significant contributions either in the provision of equipment or in providing immunization services to selected populations. Several NGO's, notably Rotary International in Sudan, SCF (UK) in Sudan and Somalia, and Médecins sans Frontières in Sudan are making effective contributions which are well integrated into national programmes.

3.4.4 Ensure that programmes are continuously evaluated and adapted so as to achieve high immunization coverage and maximum reduction in target disease deaths and cases

Within EMR, immunization coverage levels in children aged less than one year have been maintained at high levels or have increased, in all except one country where local factors, subsequently corrected, caused a small percentage drop in coverage (Figure 3). The policy of targeting immunization activity at the under one year priority age group is now regionally implemented, although optimal WHO immunization schedules are not yet being applied in all countries.

Progress was made in many countries in developing improved systems of surveillance and, although reporting efficiency remains low in almost all countries, previous downward trends in reported incidence rates of all EPI target diseases, except tetanus, continued in 1985.

Regional performance in eliminating NNT is poor. Less than 4% of all women in the age group 15-44 years, and only a reported 14% of all pregnant women are annually receiving two doses of tetanus toxoid. No figures for cumulative levels of immunity are yet available. However, awareness of the need to report neonatal tetanus as a disease separate from other forms of tetanus is increasingly accepted, although delays in modifying reporting procedures do not yet allow this to be applied in all member states.

Table 4 shows the EPI reviews conducted by member countries, by year, since 1980. A further five reviews are planned for 1986.

Table 4
EPI programme reviews in the Eastern Mediterranean Region

Year	Countries reviewed	Population (millions)	% Regional population
1980	Bahrain, Somalia, UAE	5.94	2
1982	Jordan	3.13	1
1983	Oman, Syria, Yemen	16.66	6
1984	Cyprus, Egypt, Iran, Pakistan	183.63	62
1985	Saudi Arabia, Iraq, Tunisia, Dem. Yemen	34.2	12
Total	15 countries	243.56	83

3.4.5 Pursue research efforts as a part of programme operations

Within EMR, research is being carried out with respect to the incidence of paralytic poliomyelitis, neonatal tetanus, to the use of two-dose schedules of immunization, the persistence of maternal measles antibodies and to means for developing surveillance systems. In promoting the development of management competence to obtain high levels of coverage, research has been relatively neglected. Much investigative work has, however, been carried out by programme staff and included routinely in project operations.

3.5 EUROPEAN REGION

The European Regional Office defined its role in the WHO 7th General Programme of Work as follows:

- to help make existing knowledge better known,
- to promote priority health research,
- to act as a catalyst in promoting national health policy development towards HFA 2000,
- to improve cooperation and coordination between international organizations active in the health field.

The Expanded Programme on Immunization includes all these components.

3.5.1 Magnitude of the problem

Communicable diseases are the third main cause of death (8%) after cardiovascular diseases (54%) and neoplasms (19%) in industrialized countries.

Table 5 shows the changing pattern of vaccine preventable diseases between 1961 and 1983.

Table 5
Estimated incidence of vaccine preventable diseases,
European Region, 1961 and 1983

Disease	1961	1983
Diphtheria	59 000	2 130
Tetanus	10 650	2 840
Pertussis	784 000	217 070
Measles	2 132 000	1 252 000
Poliomyelitis	22 220	490
Mumps	2 400 000	2 373 900
Rubella	1 300 000	1 260 150
Tuberculosis	600 000	175 600

3.5.2 Policy

The European Region first adopted immunization policies in 1959 at the European Technical Conference on Control of Infectious Diseases through Vaccination Programmes (Rabat, Morocco). These were reviewed at the Second Conference on Immunization Policies in Europe (Karlovy Vary, 1984).

In the framework of the Regional HFA 2000 strategy, Target 5 has been formulated and adopted at the 34th session of the Regional Committee, Copenhagen 1984. The part of Target 5 devoted to EPI states:

- By the year 2000, there should be no indigenous measles, poliomyelitis, neonatal tetanus, congenital rubella or diphtheria in the Region.
- This target could be achieved through a well organized primary health care system ensuring effective epidemiological surveillance and vaccination coverage.

Participants of the Second Conference on Immunization Policies in Europe worked out specific recommendations to achieve Target 5. They included recommendations to eliminate poliomyelitis and neonatal tetanus from the Region by 1990.

The European Advisory Group on EPI had a meeting in Copenhagen in September 1986, which summed up the results of the work conducted during the period of 1984-1985. The group found that some of the recommendations of the Second Conference on Immunization Policies in Europe (1984) were implemented successfully, whereas others were not: out of 32 Member States, only 8 had presented a formal declaration on their support of regional target 5 and on setting up their EPI national target.

3.5.3 Major achievements

An information system on the incidence and surveillance of infectious diseases was established at the WHO collaborating centre in Rome (1984). Sentinel surveillance has been introduced in some countries (Belgium, France, Netherlands, United Kingdom). This demonstrated striking underreporting of measles, rubella, mumps and other EPI infections in some Member States by existing national notification systems. More countries were encouraged to introduce sentinel surveillance systems. The number of countries participating in the regional information system on EPI almost doubled (from 16 to 28) in the period 1984-1985.

Information on immunization coverage rates has also improved as Member States have revised their systems of reporting and have begun to provide more reliable information to WHO.

Immunization against measles has proved to be successful in Albania, where no cases of the disease have been observed for some years, and in Czechoslovakia, Hungary and Rumania, where monitoring of the programme is of high quality. In other countries the situation is less satisfactory, with a reported average incidence of more than 100 per 100 000 inhabitants.

A few countries have established elimination targets for rubella and mumps (Finland, Norway, Sweden, Iceland) or plan to introduce routine immunization against these diseases in 1987 (Albania, Denmark, Netherlands, Switzerland).

Diphtheria and poliomyelitis are disappearing in more than 60% of Member States. Immunization against tetanus along with the improvement of maternal and child care has helped to eliminate tetanus neonatorum in a large proportion of the European population. However, it continues to occur in the southern countries of the region. Tetanus is still a problem in certain older unimmunized populations.

Although pertussis is not listed among the regional target diseases, those countries with conventional pertussis vaccine included in their immunization schedules were able to demonstrate its effectiveness.

During the period 1972-1986, tuberculosis morbidity and mortality rates declined by some 50% in Europe. The further progress of tuberculosis control will greatly depend on systems of surveillance, early diagnosis, immunization and secondary prevention of the disease.

The recent EPI immunization campaign in Turkey, organized with the assistance of WHO and UNICEF, helped to improve immunization coverage in that country in 1985.

3.5.4 Major constraints

Poor notification and surveillance in many European countries creates the impression that bacterial, viral, mycotic and parasitic diseases are no longer problems which deserve particular attention in the Region.

Several effective vaccines which could substantially reduce morbidity and mortality as well as disability and economic loss are not yet included in many national programmes of immunization (i.e. pertussis, MMR, Haemophilus influenza, meningococcal, pneumococcal and hepatitis B vaccines). In some European countries the present high costs of these vaccines are an important constraint.

In Table 6 an overview is given of the vaccines in use in the countries of the Region.

Table 6
Countries and vaccines provided to infants and young children
European Region, 1986

Vaccine	No. of countries
Diphtheria	32
Pertussis	30
Tetanus	32
Poliomyelitis	32
Measles	30
Rubella	11*
Mumps	5
BCG	19

* A further 10 countries are immunizing adolescent girls

3.5.5 Areas identified for improvement

- Surveillance: introduction of sentinel system, serological surveys.
- Assistance to some Member States in formulating immunization policies in line with WHO's strategy.
- Remedy of deficits in the cold chain as revealed by recent small scale studies.
- Inclusion of additional vaccines in the national immunization schedules.
- Assistance to Member States in production, quality control and evaluation of EPI antigens, in the laboratory and in clinical trials.
- Motivation of Member States to accelerate their national EPI in line with WHO Global policies, emphasizing an intersectoral approach, health education and public participation.
- Provision of the latest information on developments in the field of EPI to member countries.
- Exchange of experience gained by Member States and WHO at regional and global levels through advisory groups, regional and other meetings, seminars, training courses and correspondence with national counterparts.
- Motivation of Member States to simplify their schedules of immunization, to reduce the list of contraindications, to improve immunization coverage, and to introduce EPI monitors in the cold chain.
- Continuous evaluation of the progress of EPI at regional and national level.
- Financial support to the regional programme.

3.6 WESTERN PACIFIC REGION

The Western Pacific Region initiated the EPI in 1976. To accomplish the 1990 objectives the following approaches are being used:

- Review and development of plans of operation, with emphasis on programme delivery at peripheral levels and the inclusion of WHO recommendations with regard to immunization schedules, quality of vaccine used and produced, cold chain systems, and health education.
- Development of the managerial and training capabilities of senior and middle-level health personnel responsible for the implementation of the programme. Special attention is being given to the development of national facilitators who will conduct national training courses.
- Development and strengthening of active surveillance of the target diseases and dissemination and exchange of information related to the programme in the Region.

- Support for studies on the epidemiology of target diseases and for operational studies on improving service delivery.
- Provision of vaccines for countries with no national production capacity and collaboration in improving national vaccine production where such production exists.

Steady progress has been recorded by most countries of the region in the area of childhood immunization services. Yet programme acceleration remains an over-riding priority for most countries if the 1990 immunization goal is to be attained. Further expansion of the EPI is necessary in Vietnam, the Philippines, Kampuchea, Laos, and Papua New Guinea.

A review of the 1985-86 progress of the EPI in the Western Pacific Region, in relation to the Five-Point Action Programme adopted by the World Health Assembly in 1982, is summarized below:

3.6.1 Promote EPI within the context of primary health care (PHC)

EPI plans at national level are being developed within the context of primary health care with emphasis on programme delivery at peripheral levels. EPI evaluations have been merged with PHC in countries where EPI was not a part of PHC.

The majority of EPI training courses conducted at national level have included materials related to other primary health care elements (diarrhoeal disease control, breast-feeding, growth monitoring, nutrition, environmental health and epidemiological surveillance).

3.6.2 Invest adequate human resources in EPI

Several training courses were conducted during the period covered by this report. The first EPI programme managers workshop in the Western Pacific Region was held in July 1986 to review the present status and plan for acceleration, taking into consideration the WHA 1986 resolution. This workshop concluded, inter alia, that the South Pacific Area has the potential for becoming a poliomyelitis free zone and that measles and neonatal tetanus should be the objects of disease reduction targets.

3.6.3 Invest adequate financial resources in the EPI

The regional EPI receives financial support from different agencies for intercountry and country activities. UNICEF is supplying vaccines, materials and equipment. Substantial investments in terms of EPI health manpower are being borne by the national health administrations, but the majority of the countries are still in need of external financial support, particularly in view of the present economic situation.

3.6.4 Ensure that programmes are continuously evaluated and adapted to achieve maximum reduction of target disease deaths and cases

During the period under review, nine immunization coverage surveys were conducted in 5 countries. Table 7 summarizes results of coverage surveys, Table 8 shows the regional immunization coverage.

Table 7
Results of immunization coverage surveys,
Western Pacific Region, 1986

Vaccine	Range
BCG	44 - 98
DPT-3	35 - 93
Polio-3	30 - 92
Measles	17 - 91
Fully immunized	13 - 89

Table 8
Regional immunization coverage
Western Pacific Region, 1986

	Vaccine	Coverage %
Infants	BCG	65
	DPT-3	68
	Polio-3	76
	Measles	72
Pregnant women	Tetanus 2	4

An important problem in some of the countries is the large drop-out rate (up to 40%) between the first and last doses of multi-dose vaccines. The coverage of measles vaccine is low due to its recent introduction in some countries.

EPI information is being strengthened for better reporting of EPI target diseases. A downward trend is already discernable for poliomyelitis, diphtheria, tetanus and measles.

Cold chain evaluations were carried out in China (two provinces), Papua New Guinea and Kampuchea and recommendations were made for better management. Logistic courses were held in Papua New Guinea and Viet Nam.

From March 1985 through October 1986 evaluations were carried out in Tonga, Samoa, Lao People's Democratic Republic, Philippines, and Solomon Islands, and four provinces in Viet Nam,

In most countries of the Region, the vaccines employed in EPI meet WHO standards. The Philippines, in cooperation with WHO, has made efforts to improve the production of DPT vaccine, and is now self-sufficient in BCG production. Viet Nam is producing its own oral poliomyelitis vaccine, has evaluated BCG production in March 1985, and has started a test run for DPT production. China is producing all the EPI vaccines and is presently in the process of upgrading their quality, with WHO/UNICEF collaboration.

Hepatitis B infection is highly endemic in many countries of the Region (China, Viet Nam, Republic of Korea, Japan and South Pacific) and carrier rates range from 2.7 to 11%. Mother to infant transmission is an important factor in causing a persistent Hepatitis B carrier state.

The Region is taking a lead in the production of hepatitis B vaccine and its introduction in infant immunization. The vaccine is offered to newborns by China, Hong Kong, Japan, New Zealand, Niue, American Samoa and Nauru.

3.6.5 Pursue research efforts as a part of programme operations

Half the population of the world is expected to live in large urban areas by the year 2000, and this will have a significant demographic effect in the Region. Immunization coverage in such areas is typically poor. Research is needed to identify and evaluate methods to improve services in urban areas.

4. REVIEW OF THE EPI IN THE SOUTH-EAST ASIA REGION

4.1 Regional Overview

The EPI is implemented in all of the eleven countries of the Region with the support of WHO, UNICEF, UNDP and other multi-lateral, bilateral and private agencies. The EPI, SEARO, supports training programmes on the technical and management aspects of EPI; disseminates EPI-related information; provides short term consultants and WHO staff for technical assistance and promotes extending the use of immunization coverage surveys, strengthening the surveillance systems for EPI target diseases and developing flexible strategies and methodologies for implementing, monitoring and evaluating national immunization programmes.

The targets for the EPI in SEAR as stated in the medium term programme are:

- (1) by 1986, all countries should have developed reliable epidemiological surveillance of immunization and of EPI target diseases so that it will be possible to measure the achievement of the programme, particularly in terms of the immunization coverage and disease reduction;
- (2) by 1988, all countries should have established morbidity and mortality reduction targets for the period 1990-1995 to be achieved by the EPI;
- (3) by 1990, immunization against the EPI target diseases should have been made available for all children of this Region, and immunization against tetanus, as needed, for all women of child-bearing age.

At the national EPI Managers Consultative Meeting in 1985 in New Delhi, Regional goals for disease reduction for poliomyelitis and neonatal tetanus were set. Achievable regional targets by 1990 are:

- (a) reduction of neonatal tetanus mortality to less than 1 case per 1 000 live births, and
- (b) at least 75 percent reduction of paralytic poliomyelitis morbidity from a starting estimate in unimmunized areas of approximately 20 cases to less than 5 cases per 100 000 population.

As of May 1986, all countries of the Region had included measles vaccine into their national immunization programmes. With the marked reduction in cases seen in DPR Korea, Mongolia, Sri Lanka and Thailand the stage has been set for the possible consideration of country and ultimately regional elimination of poliomyelitis.

Most countries have worked to strengthen their immunization programmes through the implementation of the Five-Point Action Programme endorsed by the WHA in May 1982, and the guidance provided by the 35th Regional Committee.

4.1.1 Promote EPI within the context of primary health care (PHC)

The EPI supports development of mechanisms to enable the community to participate as an active partner in programme planning, implementation and evaluation. Two research projects on community participation in EPI are currently being funded in this region by WHO, one in Indonesia and one in Thailand.

The EPI promotes delivery of immunization services as an integral part of health services, and all countries of the Region currently provide at least some immunization services in a routine manner through basic health services, either throughout the country or in selected areas. Recent national programme reviews conducted with WHO assistance combined the assessment of EPI with selected aspects of PHC.

4.1.2 Invest adequate human resources in EPI

Personnel inadequately trained in EPI activities present a constraint at almost all levels. In particular, management skills, including field supervision, need to be strengthened. The EPI in SEAR is now emphasizing national rather than intercountry workshops in the Region. This helps to overcome language difficulties and also allows adapting the course material to the local situation. The EPI is encouraging an integrated approach to training, utilizing materials for EPI, CDD and, more recently, ARI in the same workshop.

WHO has supported improvement in trained manpower resources by assisting and participating in interregional, intercountry and national EPI courses and workshops. Since 1977, 520 national staff from countries of the Region have been trained in EPI-related interregional (151) and intercountry (369) courses and workshops. In addition, 28 058 programme staff from different levels have been reported as trained in national training activities in 1985 as against 13 341 persons trained in 1984.

A goal of the MTP is to integrate training in immunization into the curricula for all health workers. SEARO has emphasized conduct of national workshops for trainers of PHC workers to strengthen their teaching programmes in EPI and CDD. To date, such workshops have been held in Bangladesh (32 participants), Burma (30 participants), India (22 participants), Indonesia (28 participants) and Sri Lanka (18 participants). The EPI unit is currently conducting a follow up survey to assess the results of these workshops.

4.1.3 Invest adequate financial resources in EPI

Support for immunization programmes, both from within national programmes and from external resources, has improved. Contributors include organizations of the United Nations system (in particular UNICEF, the World Bank and UNDP), bilateral development agencies and private and voluntary funds (including the new Polio Plus programme of Rotary International). IMPACT, an international initiative promoted by UNDP, UNICEF and WHO against avoidable disablement, has been supporting immunization programmes in selected areas of India.

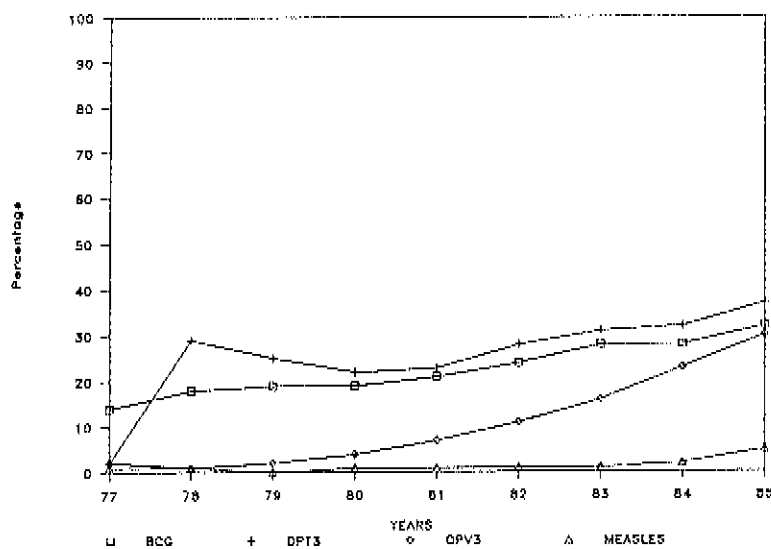
Data available from the EPI information system estimate that programme funds in 1985 in the countries of the Region were in excess of US\$22.4 million from governments, \$930 000 from WHO and in excess of \$4.75 million from other sources including UNICEF. These investments must substantially increase every year if the rate of progress is to be accelerated to a level that would permit the achievement of the EPI goal by 1990.

4.1.4 Ensure that programmes are continuously evaluated and adapted so as to achieve high immunization coverage and maximum reduction in target disease deaths and cases

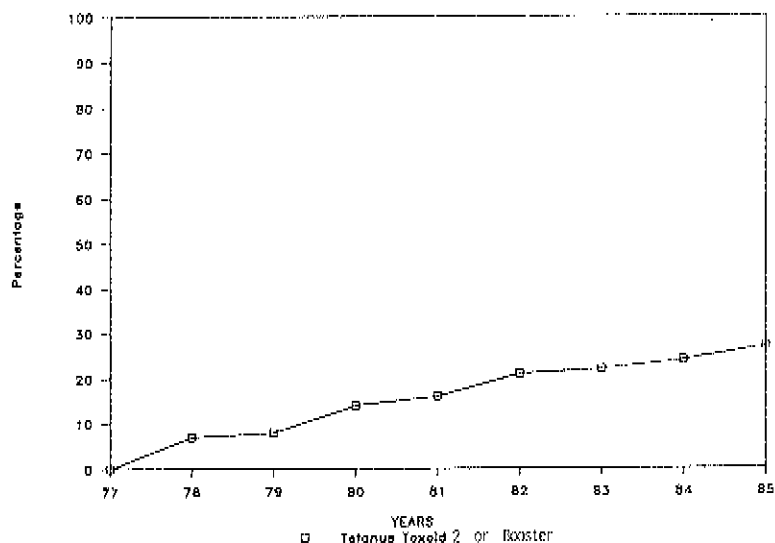
With the development of the EPI information system, data on immunizations performed, by age and dose, have become available from most countries of the Region. Regional immunization coverage estimates for the period 1977-1985 are shown in Figure 4.

Figure 4
IMMUNIZATION COVERAGE, SEAR, 1977 - 1985

Percent coverage of children under 12 Months



Percent Coverage of Pregnant Women



Disease reduction targets have been set by five countries in SEAR as shown in table 9. In some instances, the targets will have to be reviewed and revised based on further epidemiological studies.

Table 9
Diseases for which reduction targets have been set
by Countries in SEAR

Country	Diphtheria	Measles	Pertussis	Polio	Neonatal Tetanus	All Tetanus	Tuberculosis
Burma	+	+	+	+	+	+	+
India	-	-	-	+	+	-	-
Indonesia	+	+	+	+	+	-	+
Sri Lanka	+	+	-	+	+	-	-
Thailand	+	+	+	+	+	+	+

In DPR Korea, Mongolia, Sri Lanka and Thailand an overall reduction in some of the target disease cases has already demonstrated the impact of the EPI. The drop in morbidity for poliomyelitis in 1984 (the first year with greater than 20% coverage with OPV-3 in the Region) may also be a first indication of regional impact of immunization on this disease.

4.1.5 Pursue research efforts as part of programme operations

While some EPI health services research has been carried out in the Region since the start of the EPI, it is only a small part of the research required to improve programme delivery. There is a need to augment these activities and to identify programme successes that should be replicated and practices that need improvement.

The Regional review included six country reports.

4.2. Bangladesh

The EPI was started in 1979, using all antigens, and by 1985 over 1200 centres had been established around the country. Immunization coverage remained very low because of the limited number of staff actually giving immunizations - only a few hundred "EPI technicians".

In 1985, the government decided that all basic health and family planning workers should participate in providing weekly immunization sessions in each of 13 500 wards in the rural areas. Carefully designed and phased social mobilization plans were formulated to generate both support and demand. Acceleration of activities in municipalities was identified as a separate element of the new strategy.

The plan for rural outreach intensification provides for the phased uptake of progressively larger groups of upazilas (sub-districts) with the goal of reaching 85% coverage with all antigens in all the 460 upazilas by the end of 1989-90. The cold chain has been strengthened and additional key management and technical posts have been created and filled.

Innovative aspects of the new strategy include: a major role for NGOs to assist in training, supervision, monitoring and community mobilization; the creation of a cadre of "vaccine runners" to permit the delivery of vaccine carriers to all weekly ward-level sessions; the planned utilization of funds available from each upazila parishad (council) to meet local operating costs; and the strong emphasis on local level planning, with the involvement of the community.

To coordinate and guide the implementation, weekly and monthly project review meetings are held, and both a National EPI Steering Committee and a National EPI Advisory Committee (interministerial) have been established. Early results from 8 upazilas where the new intensified rural outreach strategy was started in June/July 1986 are encouraging, and the practical experience gained is being incorporated in the preparations for the start of the new programme in a further 62 upazilas before June 1987.

An interim programme review is scheduled for early 1987 and a full review in 1988.

4.3 India

Logistics of the immunization programme in India have been adapted to the enormous number of beneficiaries, an extensive area of operation and a diversity of terrain, climate and sociocultural factors. A total coverage of infants and pregnant women by 1990 - 21.5 and 23.9 millions annually respectively, is planned through two strategies:

1) A regular immunization programme has been operating since 1978. Modest inputs and augmented infrastructure aim at a gradual expansion.

2) An accelerated universal coverage programme was started in 1985 and is dedicated to the memory of the late Prime Minister Mrs Indira Gandhi. It involves intense efforts for total coverage in selected districts, with additional inputs of equipment, manpower and supplies. Initially 30 districts and catchment areas of 50 medical colleges were taken, and in 1986 this was extended to 90 districts and all the medical colleges covering a population of 187 million. It is contemplated to double this coverage in 1987. Appropriate modifications of this strategy are being evolved to sustain a high level of coverage in these areas.

The services are provided through an extensive infrastructure consisting of about 80 000 subcentres and 11 500 primary health centres. The manpower involved requires extensive training. During 1986, 1 200 technical officers and 50 000 health workers were provided with specially prepared courses and training materials. To improve management of the programme at the periphery, over 50 000 copies of a comprehensive handbook including medical and managerial aspects of immunization, have been distributed to medical personnel at this level. Provision of adequate quantities of vaccines, cold chain equipment, syringes, needles and sterilizers to the districts with universal coverage, has been ensured in the national budget in 1985-90. The programme has been partially supported by UNICEF and other agencies.

Immunizations were provided during 1985 to 13.3 million infants, of which 1.46 million were in Universal Immunization Programme (UIP) districts. During 1986, this will be raised to 15.3 million and 4.6 million infants respectively.

All district hospitals in the selected U.I.P. districts and paediatric clinics of medical colleges will serve as sentinel sites. These will be supplemented by active surveillance of poliomyelitis and neonatal tetanus by health workers using disease recognition cards. Disease reduction targets have been set for 1990 for poliomyelitis (greater than 75% reduction) and for neonatal tetanus (less than 1 death per 1000 live births).

4.4 Indonesia

In Indonesia, the EPI was initiated in 1977 and was gradually expanded to cover almost 92% of the health centres by 1986. However, measles and polio vaccines, recently introduced, are at present provided in only 67% of the health centres. All health centers (5 453) will provide the six antigens in 1987.

The target for fully immunized infants and pregnant women was set as 65% in the 4th Five Year Health Development Plan (1984-1989). In 1985, an acceleration plan was formulated with emphasis on developing and supporting the infrastructure, developing the local capabilities through decentralization and mobilizing community participation.

A mix of strategies are followed. Mass campaigns were conducted only in areas with high tetanus neonatorum. Among the more important efforts in community mobilization is the involvement of the Womens Welfare Movement (PKK). They register births and motivate mothers and pregnant women to come for immunization in the integrated community health posts. Religious leaders were also mobilized to advise on immunization and to motivate female applicants for marriage to receive tetanus toxoid. Medical professional groups were involved and a workshop for all the 24 medical schools in the country was conducted in 1985.

The outcome of the 1985-1986 acceleration programme was analyzed in the national workshop for provincial EPI managers in April 1986. BCG coverage was reported as 63%, DPT 27%, Polio 24% and Measles 26%. These were great increases over the previous year. The increase in TT was modest reaching 24%. Drop out rates are declining.

Political commitment was further strengthened. The President was involved in the administration of immunization on the National Children's Day, June 1986, and he asked for support for provinces which ranked lowest in 1985-1986 coverage. A total of 87 coverage surveys were conducted in 1985-86.

A total of 1 826 vaccinators and midwives, 1 131 doctors, and 11 275 female village workers (PKK) were trained.

The EPI training course, "Immunization in Practice" was adopted for integration in the curricula of PHC workers training institutions. Forty teaching staff from 24 medical colleges and 5 public health colleges attended a workshop in January 1986. A follow up was initiated to establish immunization service and training units in all these institutions and to involve them in research and development activities.

Disease reduction targets were defined in the 4th Five Year plan. However it is presently difficult to document impact at national level. Hospital data from Jogjakarta 1978-1982 demonstrated decline in the incidence of diphtheria among the under five group. A decline was also observed for diphtheria and childhood tetanus in seven major hospitals in Jakarta.

The programme is supported by WHO, UNICEF and USAID. The World Bank will be providing measles vaccine over the next 5 years and Rotary International will provide polio vaccine for the same period.

4.5 Nepal

In Nepal, the programme was introduced in 1977-78 with DPT and BCG given in three districts. TT was introduced a year later and measles and polio vaccines were added in 1980-81. By the end of 1985-86, the programme was operational in 60 of Nepal's 75 districts, accounting for 90% of the total population. In 20 of those districts, EPI has been functionally integrated into the basic health services. Reported coverage for infants for the entire country has steadily increased: 40% for DPT-3 and 30% for Polio-3, 72% for BCG and approximately 33% for measles. Approximately 20% of women 15-44 years old are covered with TT2 or a booster.

To raise the present coverage and to reach the 1990 goal, Nepal has accelerated its activities with a mix of complementary strategies. The regular programme is being expanded to cover the remaining 15 districts over the next 15 months. Supplementary mobile teams were hired in selected districts. Routine services will now be offered in more and more health facilities which were exposed to the programme during intensification drives in various districts. Existing work schedules are being modified on an experimental basis in several districts to improve service delivery. Newly available funds are being used to increase supervision and logistic support.

To raise consumer demand, use is made of multiple communication channels and social mobilization techniques, with particular support of the NGOs, political structures, and local organizations. Finally, three annual national events are being used to launch EPI campaigns to increase awareness of EPI by all sectors and by political and community leaders and to initiate EPI services in fixed PHC facilities where services were not previously available.

4.6 Sri Lanka

The EPI was inaugurated in 1978 with all antigens given except measles, although some vaccines had been in use since 1949. By mid 1979 country wide coverage was achieved, ahead of target. Measles vaccine was introduced in 1984 and extended to the whole country by the end of 1985. Immunization is completely integrated into the general health services of the country, both preventive and curative. Vaccines are administered by public health nurses, inspectors and midwives at health centres on a regular basis, at least monthly, and at several places in most hospitals (including wards, out-patient departments and clinics).

A joint Government/WHO/UNICEF review of the national programme took place in 1981 and again in early 1986. Coverage surveys in 1986 indicated BCG coverage 100%, DPT-3 and OPV-3 91%, TT2 95% and Measles 51%. Drop out rates for DPT-1/DPT-3 and OPV-1/OPV-3 were less than 10%.

In late 1985 it was decided to accelerate the programme in order to fully immunize every newborn before the first birthday, as well as every pregnant woman with TT. Intensive efforts were made to identify all children under three years of age still unprotected, to improve registration of newborns by the midwives and to provide age appropriate immunization to the infants.

The annual reported incidence of poliomyelitis, diphtheria, pertussis and neonatal tetanus in Sri Lanka has declined dramatically since the late 1970s; the overall incidence of tuberculosis has not declined so much, although childhood TB has declined. Measles incidence does not yet show any decline.

4.7 Thailand

Thailand officially inaugurated its EPI in 1977. Polio vaccine which was first limited to Bangkok, was given in all 72 provinces by 1982. Measles vaccine was introduced in 1984. All bacterial antigens are produced locally, while viral vaccines are imported. The programme is implemented within the context of PHC. An acceleration plan was formulated in 1986 to synchronize with the 6th Five Year National Economic and Social Development Plan (1986-1991). The minimum target for 1987 for fully immunized infants is 90% and for pregnant women 80%. Disease reduction targets were set for all EPI diseases.

In 1985 the reported DPT-3 coverage was 63% and Polio-3 reached 62%, while measles was 26%. Twelve coverage surveys were conducted.

Training materials were developed in the national language. In 1985, 3 310 peripheral health workers were trained in EPI and 74 were trained in supervisory skills for EPI/CDD.

Communication material for community participation was developed, and in 1985, 18 694 community volunteers and 1 391 community leaders were trained. Information on EPI was integrated in the curricula of primary school children, through arrangement with the Ministry of Education.

The routine surveillance system provides information on EPI target diseases. A declining trend has been observed for diphtheria and for poliomyelitis since 1981. Reductions in the incidence of tetanus and pertussis have been documented for Bangkok Municipality.

5. LOCAL AREA MONITORING

Attempts to date at collecting data on population, disease incidence and immunization coverage for the 26 Local Area Monitoring (LAM) cities have been only partially successful. Data from some cities are not readily available and the quality of data provided varies greatly. Data received thus far are summarized below (Table 10).

Table 10
Surveillance data received from 26 cities

Region	Country	City	Morbidity data	
			municipal	hospital
AFR	Algeria	Alger	*	
	Ethiopia	Addis Ababa		
	Kenya	Nairobi		+
	Nigeria	Lagos		+
	South Africa	Johannesburg		
	Tanzania	Dar es Salaam		
	Zaire	Kinshasa		*
AMR	Argentina	Buenos Aires	*	
	Brazil	Sao Paulo	+	
	Columbia	Bogota	+	
	Mexico	Mexico City	+	
EMR	Egypt	Cairo	*	
	Iran	Teheran		+
	Morocco	Casablanca		
	Pakistan	Karachi		+
	Sudan	Khartoum		
EUR	Turkey	Istanbul		
SEAR	Bangladesh	Dhaka		*
	Burma	Rangoon		
	India	Bombay	+	
	Indonesia	Jakarta		+
	Thailand	Bangkok	+	
WPR	China	Shanghai	+	
	Philippines	Manila	*	
	Rep. of Korea	Seoul		
	Vietnam	HoChiMin Ville	*	

* - Incomplete data

It is apparent that far more teaching and managerial time are necessary from both central and regional levels in order to assist cities to provide the requested data.

The Group supported the LAM process while recommending that a one year period be allowed to strengthen the collection system. Prior to the 1987 meeting, data should be sought from the majority of the 26 cities which accurately reflect disease trends and programme impact. Attempts at both central and regional levels should be intensified to assist cities in establishing a surveillance system and collecting pertinent data.

6. SOCIAL MOBILIZATION

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SUMMARY

Two critical constraints on immunization programme performance are social in nature. First, awareness of services is inadequate, and there is insufficient motivation to use them. Second, there remain within each country important sub-populations that are traditionally beyond the reach of health services, e.g. landless poor, migrants, and urban poor - street dwellers in particular. The challenge is to develop ways in which to effectively communicate with these groups in order to stimulate and organize among them a conscious demand for immunization services.

The four presentations by the panel members and the ensuing general discussion demonstrated that the growing experience with social mobilization for immunization programmes is increasingly rich and varied. There were several themes that cut across specific national experiences.

1) Increased programme efficiency

Rather than being a distracting and additional task for overburdened programme managers, social mobilization of varying groups can contribute to improved programme performance:

- The active participation of mothers is facilitated by extensive use of communication media, the enlistment of local religions and community leaders and other influential figures such as teachers and traditional birth attendants. The experiences in Vellore and in Sri Lanka were especially instructive on this point, particularly regarding the importance of personal communication.
- Local community groups can be enlisted in disease reporting and outbreak control efforts, as they were in Brazil, or in the identification and registration of all eligibles as was done in Colombia.
- Actively involved community groups can strengthen the overall organization of work within health units, as they did in Turkey, or free staff from clerical and logistic duties to devote more time to their immunization tasks.

2) Political Commitment

All of the successful intensification efforts that were discussed entailed support from political leaders. Such support was frequently cited as critical in ensuring inter-sectoral co-ordination.

Experiences in Vellore (India), Nepal, Sri Lanka and Turkey underscored this point. The Sri Lanka experience illustrated that even when preventive health services are well developed, political support is beneficial to programme performance.

3) Decentralized and multi-sectoral management

All of the intensified efforts mentioned involved management overview by multi-sectoral bodies that were duplicated at every level of the government administration. The success of immunization in Sri Lanka is based on such a system. Examples of cross-sectoral links include greater use of malaria campaign household registers, as in Vellore, and access to local religious and civic leaders as in Bangladesh, Thailand and Turkey.

4) Inclusion of all essential groups

Several examples were cited of an initial reluctance on the part of government or health authorities to involve service and professional groups in immunization activities. Yet, experience has shown that every group can contribute to an acceleration effort, e.g. Rotary in Turkey, the Indian Medical Association with its Child Survival Week, the American Academy of Paediatrics and parents-teachers associations in the United States. The neglected potential of professional medical associations to mobilize widespread support for immunization through their own professional and social networks and their technical credibility, was especially highlighted.

5) Role of the education system

The importance of including immunization and other preventive health measures in the curricula of school systems was underscored, as was the direct involvement of school teachers in community mobilization efforts. The need to include current information on immunization in medical school curricula was also noted and the current experience in India of involving medical students in the accelerated immunization plan serves as one example of how this could be done.

6) Audience-based communications strategies

The dangers of basing programme design and operational decisions on untested assumptions about those involved in the programmes - both beneficiaries and service providers - were emphasized by most country experiences. The various combinations of audience, media and message content create an almost unlimited range of opportunities for action that require analysis before any can be acted upon effectively. A better understanding of the knowledge, attitudes, and behavior of parents and all other relevant parties can assist in this analysis. Experience to date has shown that normally a wide variety of communication channels, ranging from electronic media to mass events to word-of-mouth is required for effective mobilization of groups at all levels of society.

7. RESEARCH AND DEVELOPMENT

7.1 Vaccine Development

Although there are presently six vaccines used in the EPI which are safe and effective, a number of possible advances were noted which would greatly improve the programme. The Edmonston-Zagreb human diploid measles vaccine may offer the chance to immunize infants effectively at a younger age than the present 9 month recommendation.

The development of an acellular pertussis vaccine may offer a more effective vaccine with a lower reaction rate. Clinical trials in Sweden will not be completed before the end of 1987, but the advantages and constraints of introducing it into the EPI still need to be evaluated.

The Group was informed of the willingness of the Government of Japan, in collaboration with WHO, to consider requests from interested developing countries for technology transfer for the production of the acellular pertussis vaccine first developed in that country and to consider donations of this vaccine for use in developing countries when all WHO biological requirements are met. Similarly, the Government of Japan is willing to consider requests for technology transfer relating to the production of hepatitis B vaccine.

A number of other vaccines are in various stages of development. These include vaccines against such diseases such as malaria, rotavirus, and dengue. WHO programmes outside EPI are already committed in these areas and their progress will be closely monitored.

7.2 Sterilization

Considering the possible transmission of hepatitis B and AIDS, and the problem of abscesses, field studies into the risks of disease transmission through immunization are needed. WHO has recommended that more countries should consider using reusable syringes instead of disposables. The newly developed reusable plastic syringe seems to have widespread application. The "EZEJECT" disposable system has needed modification and is undergoing further trials but offers a possible revolutionary method of delivering vaccines.

7.3 Strategy

Many countries have been innovative in trying different approaches to delivering immunizations. These have included national days as well as outreach programmes. Alternative strategies need evaluating to determine their place in EPI. One important research activity must be to look at ways of reducing the number of contacts needed before a child is fully immunized: the fewer the contacts, the more likely is success.

7.4 Attitudes

It was noted that applied research in EPI has been largely concerned with operational and technical issues. It was felt that a shift in emphasis was becoming necessary so that issues could be investigated in the area of human behaviour. For instance, if a community did not wish to have its children immunized, it became irrelevant whether the programme was technically excellent. Methods and protocols are needed for looking at these complex behavioural problems.

8. POLIO ELIMINATION INITIATIVE IN THE AMERICAS

Implementation of EPI in the Americas has advanced to the stage where eradication of transmission of wild polio virus has become feasible. A target of regional eradication by 1990 was announced in 1985. It was framed in terms of promoting the overall development of EPI in the Region as well as setting up adequate systems for surveillance and outbreak control.

Implementation of the eradication efforts involved formation of a Technical Advisory Group to provide recommendations on strategies and formation of an Interagency Group to coordinate activities of the major international agencies involved, both governmental and nongovernmental. A plan of action was developed which addressed the mobilization of national resources, immunization activities, epidemiological surveillance and outbreak control, laboratory support, information dissemination, identification of research needs, eradication certification protocol and evaluation. Manuals for surveillance and laboratory investigation have been developed and a Field Guide for Polio Eradication is currently in final draft.

Countries were provisionally classified with regard to their current risk of polio virus transmission based on reported incidence of polio and immunization coverage levels:

Countries which have reported indigenous cases due to transmission of wild polio virus within the preceding 3 years are considered polio-infected.

Countries which have not reported such cases within the preceding 3 years are considered polio-free and are further categorized into:

Countries at higher risk of polio (polio immunization coverage levels in children less than one have been lower than 80% in any geopolitical unit in any of the preceding 3 years.)

Countries at lower risk of polio (coverage has exceeded 80% in all geopolitical units in all of the preceding 3 years).

Immunization strategies were developed appropriate to the level of risk, with countries currently infected with polio being advised to undertake national vaccination day efforts to increase coverage and interrupt transmission. Use of all EPI antigens in these immunization days was recommended.

Since surveillance and outbreak control are critical elements of the programme, considerable effort has been expended in developing case definitions and classifications:

A suspected case is an acute onset of paralysis in a person less than 15 years of age or any paralytic illness in a person of any age in which polio is suspected as the likely cause. This should be a temporary classification and within 48 hours of notification, every suspected case should either be categorized as a probable case or as some other illness.

A probable case is any acute onset of flaccid paralysis without another proven cause. Probable cases should be finally classified within 10 weeks of notification as either confirmed polio or not polio.

A confirmed case is a probable case with laboratory confirmation, OR epidemiological linkage to another probable or confirmed case, OR residual paralysis 60 days after onset, OR death following clinically compatible illness, OR insufficient evidence at 10 weeks to be readily categorized.

All suspected cases are to be investigated by trained personnel from the national or state (in large countries) level and control measures (application of oral polio vaccine) are to be taken around each probable case.

Training of surveillance and investigation personnel will be an important part of instituting effective surveillance programmes. It will also be important to involve personnel and institutions in surveillance who have not traditionally been involved in many countries (e.g., private paediatricians and neurologists) One goal is to ensure that in each geopolitical unit a reporting source is identified with responsibility to report each week whether or not suspected cases have occurred. Feedback of information to reporting sources at local, national, and regional levels has been given high priority and a weekly polio summary is now sent to all countries in the Region.

To ensure that adequate laboratory support is available, assessments have been carried out of the major national laboratories in the Region and six laboratories have been identified to provide support to the countries in the Region. Training courses and necessary equipment are being provided to these laboratories to ensure that each country has access to isolation and serologic testing.

Accomplishment of the eradication goal will require major efforts on the part of the countries themselves as well as international donors. Involvement of all sectors of society, particularly educational, religious, professional, and voluntary groups, will be key to success. Strong coordination from the Regional Office is also essential.

External funds necessary to supplement national resources have been identified and commitments are being obtained from the countries to provide the necessary levels of internal support. Announcement of the target of regional eradication of polio by 1990 has been an important stimulus to the overall programme

9. MEASLES IMMUNIZATION

The meeting was informed of the results of an important study concerning the impact of measles immunization on childhood mortality in Bangladesh. Using case control methodology, immunization status was compared for individuals who died, and for randomly selected survivors, matched for age and sex. Twenty-six percent of the fatalities had received measles vaccine versus 37% of the controls (p less than .0001) or a reduction of mortality of 38% attributable to measles immunization.

These data are the first evidence that measles immunization results in lowered mortality in the Indian subcontinent and they support the need for aggressive measles immunization programmes.

10. OTHER INTERVENTIONS - IODINE & VITAMIN A

Iodine and vitamin A deficiency are important public health problems in many developing countries. For example, in some areas of endemic vitamin A deficiency, 500 of 1000 live-born children will develop xerophthalmia within 5 years. Twenty-five of these affected children will become blind and 80 percent of these 25 children will die as a direct result of vitamin A deficiency. In certain areas of severe iodine deficiency, as many as 10 percent of newborns will have mental deficiency of variable severity. Both iodine and vitamin A deficiency are readily corrected with either iodine or vitamin A supplementation which can have a major impact on the morbidity and mortality associated with these two deficiencies.

Immunization programmes are active in those developing countries which have documented public health problems of iodine and vitamin A deficiency. Treatment of iodine deficiency can be achieved by injection of iodine in oil given every other year, while vitamin A supplementation is done using oral high potency vitamin A capsules.

As with the EPI, iodine and vitamin supplementation programmes are based on simple technologies which are safe and have a proven impact and they have target populations that overlap. Thus it seems appropriate to consider integrating these activities. Analysis is required of the information available from current programmes in which iodine and/or vitamin A supplementation is integrated with immunization activities. In addition field studies to assess the cost and efficacy of such combined programmes needs to be carried out.

11. PROPOSALS FOR THE 1987 MEETING OF THE GLOBAL ADVISORY GROUP

The 1987 meeting will be hosted by the Regional Office for the Americas, from 9 to 13 November 1987.

A number of suggestions were made for the agenda, including the presentation of papers relating to poliomyelitis control/elimination, surveillance, neonatal tetanus, hepatitis B, iodine and vitamin A deficiencies, management of health care at the district level and research and development. Less emphasis will be placed on providing general EPI policy statements, as these have been fairly well elaborated in previous meetings of the Group.

Members of the Group reiterated their interest in being involved in activities relevant to the EPI, especially in the Regions from which they come. Only two of the Group had been involved in such activities since the last meeting, and Regional Advisors were encouraged to look for suitable opportunities to increase this number for next year.

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ANNEX - 2

DOCUMENT LIST

General documents

EPI/GAG/86/1	Provisional Agenda
EPI/GAG/86/2	Provisional Participants List
EPI/GAG/86/3	Provisional Documents List

Working papers

EPI/GAG/86/WP.1	EPI Global Overview
EPI/GAG/86/WP.2	EPI Acceleration in AFR
EPI/GAG/86/WP.3	EPI Overview in AMR
EPI/GAG/86/WP.4	EPI Overview in EMR
EPI/GAG/86/WP.5	EPI Overview in EUR
EPI/GAG/86/WP.6	EPI Overview in SEAR
EPI/GAG/86/WP.6.1	EPI Situation in Bangladesh
EPI/GAG/86/WP.6.2	EPI Situation in India
EPI/GAG/86/WP.6.3	EPI Situation in Indonesia
EPI/GAG/86/WP.6.4	EPI Situation in Nepal
EPI/GAG/86/WP.6.5	EPI Situation in Sri Lanka
EPI/GAG/86/WP.6.6	EPI Situation in Thailand
EPI/GAG/86/WP.7	EPI Overview in WPR
EPI/GAG/86/WP.8	R&D Update
EPI/GAG/86/WP.9	Local Area Monitoring
EPI/GAG/86/WP.10	PAHO Polio elimination
EPI/GAG/86/WP.11	Integration of Immunization Activities in the Control of Iodine Deficiency Disorders and Vitamin A Deficiency
EPI/GAG/86/WP.12	Measles in Bangladesh

Other Papers

EPI/GEN/86/5	Risks of Infection Using Non-Sterile Equipment or Contaminated Vaccine in the EPI
EPI/GEN/86/6	Immunization of Children Infected with Human Immunodeficiency Virus (HIV)
EPI/GEN/86/7	EPI Immunization Policy
EPI/GEN/86/8	Neonatal Tetanus - Guidelines on the Community-Based Survey on Neonatal Tetanus Mortality
EPI/GEN/86/9	Prevention of Neonatal Tetanus through Immunization
WHO/UNICEF/EPI.TS/86.2	Joint WHO/UNICEF Guidelines on selection of injection equipment for EPI

ANNEX - 3

TERMS OF REFERENCE FOR THE GLOBAL ADVISORY GROUP
for the Expanded programme on Immunization

1. An appropriately 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:
 - (a) advise the WHO secretariat with respect to Programme priorities over the short, medium, and long term,
 - (b) promote the exchange of information concerning Programme strategies and tactics among participants functioning at country, regional and global levels, and
 - (c) promote the understanding of, and support for, Programme goals among technical and political leaders.
3. Composition of the Advisory 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. Appointments 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. Reappointments 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 appropriately.

ANNEX - 4

WHO RESOLUTION WHA39/30

WHA39.30 Expanded Programme on Immunization

The Thirty-ninth World Health Assembly,

Noting the report of the Director-General on the Expanded Programme on Immunization¹ and the Executive Board's discussion on the report;²

Noting further the general recommendations for action contained in the Director-General's report, which emphasize the need to accelerate progress, furthering the five-point action programme endorsed by the Thirty-fifth World Health Assembly by: promoting the achievement of the 1990 goal through collaboration among ministries, organizations and individuals in both the public and private sector to create effective consumer demand and ensure that this demand is met; adopting a mix of complementary strategies for programme acceleration; and ensuring that rapid increases in coverage can be sustained through mechanisms which strengthen the delivery of other primary health care interventions;

Noting also the recommendations for specific actions contained in the Director-General's report, which call for: providing immunization at every contact point, reducing dropout rates between first and last immunizations, improving immunization services to the disadvantaged in urban areas and increasing the priority for the control of measles, poliomyelitis and neonatal tetanus;

Recognizing that continued efforts are also required to strengthen disease surveillance and outbreak control, reinforce training and supervision, ensure the quality of vaccine production, management and administration, and pursue research and development;

1. AFFIRMS that the Expanded Programme's goal of reducing morbidity and mortality by providing immunization for all children of the world by 1990 remains a global priority and represents a milestone toward achieving health for all by the year 2000;
2. WARNS that the goal will not be achieved without continuing acceleration of national programmes;
3. URGES Member States to pursue vigorously the recommendations for action contained in the Director-General's report and to commit themselves fully to achieving the 1990 immunization goal as part of their strategies for achieving health for all by the year 2000 through primary health care;
4. CALLS on organizations of the United Nations system to support the Expanded Programme in the context of United Nations General Assembly resolution 34/58, which endorsed the Declaration of Alma-Ata, welcomed the efforts of WHO and UNICEF to attain health for all by the year 2000, and called upon the relevant bodies of the United Nations system to cooperate with WHO and support its efforts by appropriate actions within their respective spheres of competence;
5. NOTES with appreciation the increased international support for immunization programmes being provided particularly by the United Nations Children's Fund and by national development agencies, private and voluntary organizations and individuals, whose collective efforts are helping to bring the immunization goal within reach;
6. URGES that such international support should be further increased;
7. REMINDS Member States and collaborating organizations that the 1990 goal establishes a basis for immunization coverage, which must be sustained indefinitely;
8. REQUESTS the Director-General:
 - (1) to strengthen WHO's coordinating role to help to ensure that immunization programmes continue to be carried out in consonance with the relevant policies of the Health Assembly, and in particular the policy of attaining health for all through primary health care;
 - (2) further to increase collaboration with Member States in order to meet the 1990 goal, with special emphasis on achieving reductions in the target diseases and on training, evaluation and the improvement of national, regional and global systems for monitoring progress;
 - (3) to pursue basic and applied research relevant to the field of immunization and to make the results known in good time to Member States;
 - (4) to continue to keep the Health Assembly informed of the progress of the Expanded Programme and to propose the necessary means to achieve the 1990 goal.

ANNEX - 5

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS OF REGIONAL EPI NATIONAL PROGRAMME
MANAGERS CONSULTATIVE MEETING, SEARO, NEW DELHI, 1985

1. General

During the Meeting, discussions were held on the implementation of the Expanded Programme on Immunization in the countries of the Region and on managerial, operational, and technical aspects of the programme. National experiences were shared, problems identified, and possible solutions and future directions reviewed. While impressive progress has been made and several countries have already registered reduced disease incidence, the country reports and working papers clearly showed that unless there is an intensification of programme activities, the goal of providing immunization services to all eligible children by 1990 will not be reached.

Studying the issues that had been presented in the plenary and discussed in the working groups, the Meeting arrived at the following conclusions and formulated the recommendations that follow.

2. Accelerated Immunization Activities

1990 is rapidly approaching and the immunization coverage, through increasing, remains low. Only about 40 per cent of the Region's infants receive a third dose of DPT and about 30 per cent receive a third dose of polio vaccine. Increasing the coverage levels for these and other vaccines to a point where significant reductions in morbidity and mortality can be achieved and sustained remains a formidable challenge. To accomplish this, immunization activities can be accelerated by a variety of strategies. Specific actions to be taken include the following:

2.1 Immunization delivery within the existing health infrastructure must be assessed critically, strengthened, and, where necessary, extended through outreach sessions to populations without access to fixed facilities.

2.2 Efforts are required to increase the involvement in EPI of other sectors and agencies, non-governmental organizations, professional bodies, religious organizations and other manpower sources such as, for example, private physicians, traditional practitioners, teachers, other front-line workers, etc.

2.3 Acceleration is required in the wider application of existing national policies and WHO recommendations, such as ensuring that the policy on contraindications is correctly applied and that vaccination efforts are focused on the highest risk groups i.e., infants and mothers.

2.4 Accelerated immunization activities should be established as a continuous, sustained measure, as an integral part of the primary health care approach, for as long as necessary. Accelerated immunization should not be confused with mass campaigns.

2.5 Additional inputs must be provided. Existing resources must also be analyzed to ensure their optimal utilization.

2.6 Some countries may consider that the use of additional intensified approaches, such as periodic rounds of intensified activities or designation of one or more days each year as national immunization days, is desirable. Such approaches have been used with varying degrees of success in several countries.

3. Training

Although training is a vital element for the effective implementation of EPI, it has not been given sufficient systematic attention in some countries. Training should be strengthened by the training of trainers, preparing locally relevant training and health education materials, and by more actively involving higher level staff in the training of field staff.

The following are specific recommendations:

3.1 Each country should analyze its EPI training programme. Staff requiring training must be identified, a "multi-year" plan developed, and resources identified to implement the training plan.

3.2 To ensure the quality of training content and methodology, use should be made of the WHO EPI modules, suitably adapted and translated into national languages.

3.3 Though intercountry EPI training courses are useful, the focus should now shift to conducting national courses.

4. Immunization Coverage Information System

Routine reporting of immunization coverage is necessary at all levels to evaluate the progress of the programme as well as to identify problem areas requiring improvement. In the absence of a reliable routine reporting system, alternative methods of estimating vaccination coverage are needed. The following recommendations and points for action were endorsed:

4.1 It will be desirable to obtain, by 1986, routine immunization coverage data from all countries, by dose, for children under one year of age, 12- 23 months, and more than two years.

4.2 Doses of tetanus toxoid administered should be reported separately for pregnant women, women of child-bearing age, and other adults.

4.3 The completeness, efficiency, and timeliness of reporting must be systematically monitored at all levels to improve compliance.

4.4 Thirty-cluster EPI coverage surveys should be continued in most countries or initiated at the earliest possible date in countries where they have not been performed as yet. The number and areas of surveys should be chosen in such a way that the results can be representative of a larger administrative area. Coverage surveys should also elicit the reasons for immunization failure and, especially in countries where a large proportion of vaccinations are administered outside the routine reporting system, the source of vaccination.

4.5 Survey data should be analyzed and compared with routine reports to confirm their validity. In certain cases, follow-up investigation may be indicated.

5. EPI Target Diseases Surveillance

Extra efforts and resources are needed to achieve the Regional Medium-Term Programme target of establishing reliable surveillance of the EPI target diseases by 1986. It may not be possible to achieve this target in respect of data for the entire country but surveillance should be developed in selected areas. It may be necessary to use a number of different surveillance systems or a combination of methods to achieve reliable surveillance.

Specific actions that are needed include the following:

- 5.1 EPI should strive as much as possible to work through, and improve, the routine surveillance system.
- 5.2 Countries should standardize field diagnostic criteria and case definitions at the national level for each of the EPI diseases.
- 5.3 In most countries, during the period when routine surveillance is being strengthened, EPI should establish a sentinel surveillance system to generate more relevant and reliable data on the EPI target diseases, such as baseline age-specific incidence rates in defined populations, secular and seasonal trends, immunization status of cases, etc.

6. Establishing Disease Reduction Targets

Setting disease reduction targets for the EPI target diseases can help to serve as an indicator for evaluating the achievements of the programme and to mobilize more resources in support of immunization efforts. It was felt that it is possible to establish disease/mortality targets by 1988 for selected EPI diseases. Target rates can be set for poliomyelitis morbidity, neonatal tetanus mortality, and in some countries, possibly measles morbidity.

Achievable regional targets by 1990 are:

- (a) reduction of neonatal tetanus mortality to less than 1 case per 1,000 live births, and
- (b) at least 75 per cent reduction of paralytic poliomyelitis morbidity from a starting estimate in unimmunized areas of approximately 20 cases to less than 5 cases per 100 000 population.

7. Health Services Research

The provision of immunization services to all children by 1990 is not dependent on additional knowledge or technologies. Rather, the limitations of EPI delivery are the result of a failure to fully and properly apply existing knowledge and technologies. To strengthen EPI activities, health services research as part of programme operations is required to identify programme successes and weaknesses.

Priorities for health services research are in the fields of delivery strategies, community participation, factors influencing immunization coverage, and cold chain and logistics.

8. Cold Chain and Logistics

Recent improvements in the cold chain are impressive but much remains to be done. The major constraint is no longer inadequate equipment but the improper use of that equipment and a failure to seek out innovative solutions to cold chain problems using available resources. The most pressing needs are:

- 8.1 Design or adaptation of existing training materials and conducting national courses on cold chain and logistics; short "refrigerator user's courses" and national maintenance and repair courses on cold rooms and refrigerators.
- 8.2 The improved equipment that is presently available, including suitable voltage stabilizers and chemical cold chain indicators, could be more widely used in the Region.

8.3 Equipment repair and maintenance can be improved by organizing repair workshops, deploying mobile teams of technicians, and creating stocks of appropriate spare parts at each level.

8.4 The "quota system" of vaccine supply should be phased out and replaced by a distribution system based on past usage, expected demand and stock balance. Indent and recording/reporting forms and registers will require modification.

8.5 Syringes and needles should be provided in sufficient quantities to ensure that a health worker has at least one sterile needle and one sterile syringe for each injection at the immunization session.

9. Procurement, Production, and Potency-Testing of Vaccines

WHO is ready to provide the technical support to countries for research and development in vaccine production, wherever technically and economically feasible. Efforts of WHO in establishing a regional network of quality control laboratories should continue.

Technical cooperation between developing countries (TCDC), particularly with respect to training in vaccine production technology, quality control, development of technologies, studies on shelf life, etc., should be encouraged.

The feasibility of attaining regional self-reliance in the production of viral vaccines should be explored.

10. Call for Continued Support

WHO, UNICEF, and other international and bilateral organizations are urged to continue providing maximum support for the strengthening of immunization activities in the countries. In view of the rapidly approaching date of 1990, it is suggested that WHO convene yearly national EPI managers consultative meetings.

ANNEX - 6

PROGRAMME DATA
(based on data available as of August 1986)

Table 1
Estimated immunization coverage with
BCG, DPT, poliomyelitis, measles and tetanus vaccines

Country Developing countries ranked by surviving infants.	Newborns surviving to 1 year of age (millions)	Cumulative percentage of births	Immunization coverage (%)					
			Children less than 1 year of age					Pregnant women
			BCG	DPT III	Polio III	Measles	Tetanus II	
1 India (5)	22.60	27	24	44	35	...	37	
2 Indonesia (5)	4.62	33	68	16	14	16	26	
3 Nigeria (5)	4.29	38	12	7	6	6	...	
4 Pakistan (5)	3.64	42	41	30	30	23	9	
5 Bangladesh (5)	3.05	46	3	2	2	1	3	
6 Brazil (5)	2.63	49	58	62	86	63	...	
7 Mexico (5)	2.53	52	16	40	67	64	...	
8 Iran (5)	2.17	55	64	51	51	51	18	
9 Viet Nam (5)	1.72	57	42	29	25	10	...	
10 Philippines (5)	1.69	59	76	59	61	55	55	
11 Egypt (5)	1.56	61	84	95	95	74	8	
12 Ethiopia (4)	1.55	62	14	8	8	16	4	
13 Turkey (5S)	1.46	64	50	67	67	72	...	
14 Zaire (5)	1.35	66	...	37	...	40	50	
15 Burma (5)	1.34	67	22	8	1	...	13	
16 South Africa	1.15	69	
17 Thailand (5)	1.05	70	79	61	62	29	46	
18 Kenya (3S)	1.04	71	76	58	57	35	...	
19 Tanzania (4)	1.00	73	73	52	49	63	32	
20 Morocco (4)	0.93	74	67	46	46	40	...	
21 Rep. of Korea (4)	0.93	75	47	76	80	89	...	
22 Colombia (5)	0.89	76	62	61	62	53	6	
23 Sudan (4)	0.88	77	12	8	8	6	4	
24 Algeria (1)	0.85	78	59	33	30	17	...	
25 Argentina (5)	0.71	79	89	63	69	67	...	
25 countries	65.66	79	36	38	36	22	20	
Other developing countries	17.65	21	49	38	37	35	20	
Sub-total developing countries (excluding China)	83.31	100	82	39	36	25	20	
China (5S)	17.99	18	67	74	84	83	...	
Total developing countries (including China)	101.30	100	44	44	44	35	16	
Total industrialised countries	17.36		56	62	66	76	0	
Global Total	118.66		46	47	48	41	14	

2 doses only
(1) 1981 coverage data
(2) 1982 coverage data
(3) 1983 coverage data
(4) 1984 coverage data
(s) survey data
... no information available

Figure 1
Immunization Coverage - Infants under 12 Months by WHO Region
AUGUST 1986

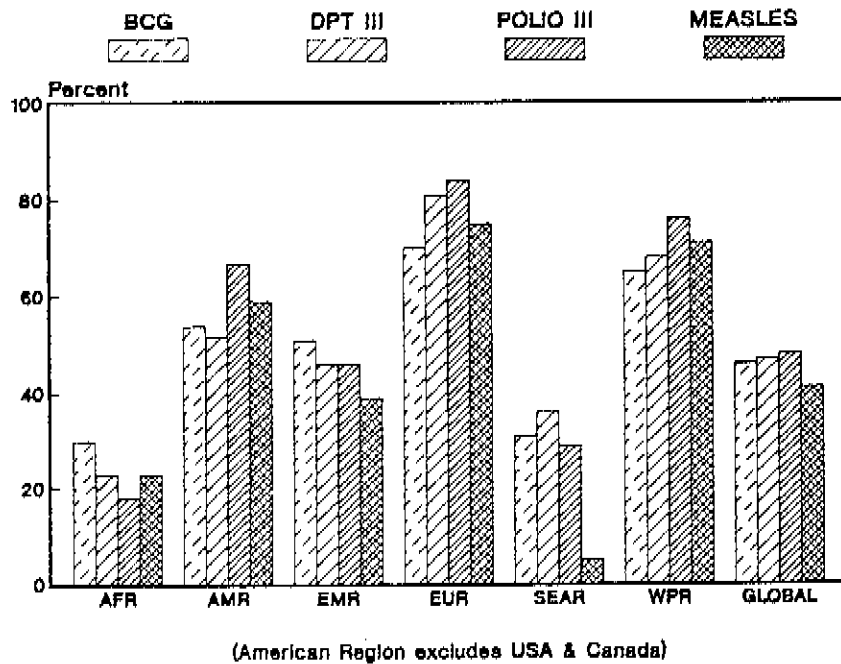


Figure 2
Reported Global Incidence of Measles, Tetanus, and Poliomyelitis
(per 100 000 population) - 1974-1985

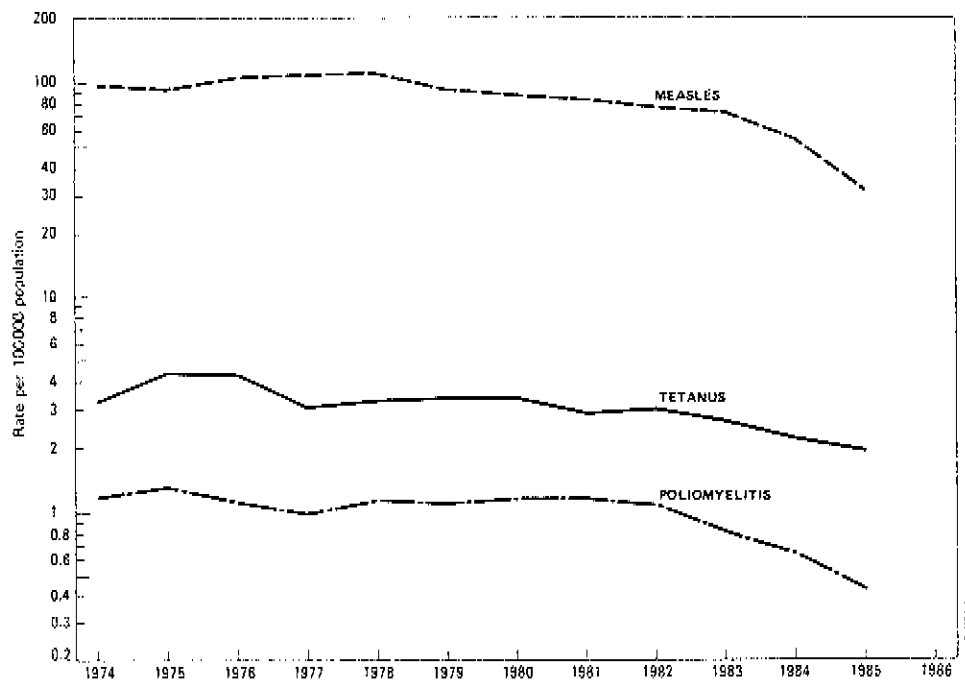


Table 2
Estimated annual number of deaths from neonatal tetanus, measles, and pertussis
and annual number of cases of poliomyelitis
in developing countries (excluding China)

	Neonatal Tetanus(1) (000's)	Measles(2) (000's)	Pertussis(3) (000's)	Total Deaths (000's)	Cum. % of total deaths	Polio cases(4) (000's)	Cum. % of cases
25 largest developing countries	654	1663	484	2801	82	217	79
Other developing countries	157	354	123	634	18	57	21
Total developing countries	811	2017	607	3435	100	275	100

The annual number of deaths from neonatal tetanus, measles and pertussis, and the annual number of cases of poliomyelitis in developing countries (excluding China) were estimated, using the immunization coverage data in Table 1 and the following assumptions:

- 1) Neonatal tetanus: Based on survey data or in absence of survey, neonatal tetanus deaths are estimated from countries with similar socio-economic conditions.
- 2) Measles: It is assumed that the vaccine efficacy is 95% and that 90% of unimmunized children will acquire measles. Coverage is assumed to be zero in countries from which data are not available.
- 3) Pertussis: It is assumed that the vaccine efficacy is 80% and that 80% of unimmunized children will acquire pertussis. Coverage is assumed to be zero in countries from which data are not available.
- 4) Polio: In view of narrow limits of variation of results of poliomyelitis surveys, and in the absence of an immunization programme, a fixed incidence rate of 5 cases per 1000 newborns is used. A vaccine efficacy of 95% is used. Coverage is assumed to be zero in countries from which data are not available.

Table 3
Estimated cases and/or deaths prevented from neonatal tetanus,
pertussis, measles and poliomyelitis in 25 developing countries
(excluding China), ranked by number of surviving infants

Country	(1) Newborns (000's)	(2) Surviving Infants (000's)	(3) Prevented Neonatal Tetanus (000's)	(4) Prevented Pertussis Cases (000's)	(5) Prevented Pertussis Deaths (000's)	(6) Prevented Measles Cases (000's)	(7) Prevented Measles Deaths (000's)	(8) Prevented Polio Cases (000's)
1 India (5)	25285	22605	89	7120	80	0	0	38
2 Indonesia (5)	4996	4616	19	512	8	702	28	3
3 Nigeria (5)	4793	4290	0	215	3	245	10	1
4 Pakistan (5)	4083	3642	11	784	12	796	32	5
5 Bangladesh (5)	3473	3050	3	44	1	29	1	<1
6 Brazil (5)	2812	2635	0	1116	9	1577	32	11
7 Mexico (5)	2653	2528	0	679	5	1537	31	8
8 Iran (5)	2383	2173	2	778	6	1053	21	5
9 Viet Nam (5)	1858	1716	0	345	3	163	3	2
10 Philippines (5)	1767	1673	3	667	8	885	27	5
11 Egypt (5)	1730	1562	1	1052	16	1098	44	7
12 Ethiopia (4)	1791	1554	<1	92	1	236	5	1
13 Turkey (5)	1608	1461	0	688	5	999	70	5
14 Israel (5)	1493	1346	5	353	4	512	15	0
15 Burma (5)	1461	1342	2	75	1	0	0	<1
16 South Africa	1253	1149	0	0	0	0	0	0
17 Thailand (5)	1091	1045	2	426	5	288	9	3
18 Kenya (35)	1121	1040	0	416	6	543	22	3
19 Tanzania (4)	1099	1000	3	366	3	598	12	2
20 Morocco (4)	1078	951	0	306	5	361	14	2
21 Rep. of Korea (4)	949	925	0	462	4	782	16	4
22 Colombia (5)	933	887	<1	364	3	447	9	3
23 Sudan (4)	989	884	<1	51	1	59	2	<1
24 Algeria (1)	942	854	0	199	2	138	4	1
25 Argentina (5)	730	707	0	294	2	450	9	2
Total	72327	65655	140	17402	191	13489	364	111
Other developing Cs.	19432	17658	37	4726	54	5870	176	31
Total developing Cs.	91759	83313	177	22128	245	19359	541	142

* All figures less than 1000 are indicated by "<1". Figures above 1000 are rounded to the nearest thousand.

(1) Newborns: based on 1985 estimated population and crude birth rates.

(2) Surviving newborns: based on estimated number of newborns and infant mortality rate.

(3) Based on mortality estimations from surveys or reports, a vaccine efficacy of 0.95 and immunization coverage reported as of August 1986. Countries without available data were arbitrarily categorised into one of 3 levels of neonatal tetanus mortality: 5, 10 or 15 per thousand live births.

(4) Based on an incidence estimation of 80% of newborns in absence of an immunization programme, a vaccine efficacy of 0.8 for 3 doses, and immunization coverage reported as of August 1986.

(5) Based on mortality estimations of one-third of neonatal deaths, a vaccine efficacy of 0.8 for 3 doses, and immunization coverage reported as of August 1986.

(6) Based on an incidence estimation of 100% surviving newborns in absence of an immunization programme, a vaccine efficacy of 0.95 and immunization coverage reported as of August 1986.

(7) Based on arbitrary case fatality rates ranging from 2% to 4%, a vaccine efficacy of 0.75 and immunization coverage reported as of August 1986.

(8) Based on an incidence estimation of 5/1000 newborns in absence of an immunization programme, a vaccine efficacy of 0.95 and immunization coverage reported as of August 1986.