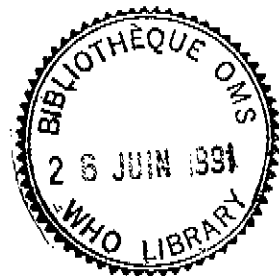


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**EXPANDED PROGRAMME ON IMMUNIZATION
REPORT OF THE 13TH
GLOBAL ADVISORY GROUP MEETING**



**14-18 October 1990
Cairo, Egypt**



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1.

INTRODUCTION

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

The thirteenth meeting on the Global Advisory Group was held on 14–18 October 1990 in Cairo, Egypt. The officers of the meeting were:

- *Chairperson*
Dr A Grech
- *Vice-Chairperson*
Dr Raj Karim
- *Rapporteur*
Dr D Salisbury

Dr R.H Henderson, Assistant Director General of WHO, opened the meeting by bringing the warm greetings of Dr Hiroshi Nakajima, Director General of WHO, and by stressing that the Global Advisory Group has a specific task of making recommendations to the Director General on how the EPI can make progress as part of a wider health development effort. Dr Henderson concluded by saying that the meeting was supported by specialists in many

fields and by the thousands of health workers who look to the EPI for guidance from the Global Advisory Group.

Dr H.A Gezairy, Regional Director of the WHO Eastern Mediterranean Region, reminded the meeting that the gains achieved in the EPI needed to be sustainable and that they are less dependent on a country's level of development than on the commitment of the individual workers. Dr Gezairy continued by out-lining the progress in the Region in increasing public awareness for immunization, increasing immunization coverage, and adding new sources of funding for the programme. He concluded by describing the progress in introducing Hepatitis B vaccine to the programme and by congratulating UNICEF on focusing world leaders' attention on the state of the world's children.

His Excellency the Minister of Health of Egypt, Dr Mohamed Ragheb Dowidar welcomed the group and indicated that Egypt and many other countries were looking forward to receiving the recommendations of the Global Advisory Group.

He indicated that the President of Egypt has given top priority to child health and the declaration of child care in Egypt is now a principle for child

health care in Egypt. He indicated that the main targets are:

- Eradicate polio by 1994;
- control neonatal tetanus to achieve its elimination by 1994;
- decrease infant mortality rate to less than 50 per 1 000 births.

The President's wife represented Egypt in the World Summit for Children and is keenly following child health and care. The Minister then highlighted achievements in immunization in Egypt with coverage rates

exceeding 90% for Polio, DPT and measles vaccines and nearly 83% for BCG. He also gave some details of the National Polio Eradication Programme.

Dr A Grech welcomed four new members to the Group: Dr T Bektimirov, Dr C Chintu, Dr B Sadrizadeh and Dr R McCaulay. He also welcomed the participation of Dr H. Acuña.

After adoption of the agenda, the meeting proceeded to review progress at Global and Regional levels.

2.

SUMMARY OF MAJOR CONCLUSIONS AND RECOMMENDATIONS

The recommendations are directed to the challenges to be addressed by the EPI during the 1990s.

The Declaration on the Survival, Protection and Development of Children and its associated Plan of Action as agreed by Heads of State and their representatives at the World Summit for Children on 30 September 1990 is welcomed. This Plan of Action, with its goals for children and development in the 1990s, brings the targets of global poliomyelitis eradication, neonatal tetanus elimination, measles reduction and protection against tetanus for women of child bearing age, to the highest levels of political visibility. The EPI should now move forward rapidly to capture the momentum of this World Summit and translate the Declaration into the necessary actions to achieve these goals.

Achieving and sustaining full immunization coverage

In the decade of the 1990s, there needs to be increased emphasis on the disaggregation of immunization coverage data. High immunization coverage levels need to be achieved and sustained in all states/provinces, all districts/municipalities, and ultimately in all communities. Intensified immunization

activities, including the use of national, state/province, or local immunization days, should be directed at areas of low immunization coverage or where there is continuing transmission of disease.

Each country should have an Immunization Plan of Action which integrates the targets of achieving at least 90% immunization coverage with all EPI vaccines, poliomyelitis eradication, neonatal tetanus elimination and measles reduction, and, in areas of risk, delivery of appropriate micronutrient supplementation. Immunization and disease control responsibilities should be decentralized.

An overall global plan of action on "the EPI for the 1990s" should be developed by WHO. This plan would serve as the basis for an integrated approach to the achievement of the 90% coverage target as well as the disease eradication, elimination and reduction initiatives. It should project the additional financing that will be required by developing countries to meet these targets, as well as detail the regular and extra-budgetary funding that WHO will require. The document will be used as the basis for approaches to the donor community.

WHO should develop uniform criteria for sustainability of immunization programmes, promote their use

and assess activities, including the allocation of resources, against these sustainability criteria.

The following areas are priorities for achieving and sustaining immunization programmes:

- *Donor coordination*
Establish and effectively implement Interagency Coordinating Committees to integrate activities aimed at sustaining immunization programmes;
- *Donor support*
Donors be prepared to maintain their support, budgeting to reach at least the end of the decade, and to consider the inclusion of other vaccines. In many countries, donor support of immunization activities must continue for the foreseeable future;
- *Management, supervision and training*
Allocate specific national budgets for supervision and incorporate an assessment of sustainability. Train supervisors to improve management, including problem-solving, and evaluate the quality of this training;
- *Communications*
Establish national communications planning committees to improve social sustainability, prepare a 5 year communications plan, appoint a national communications coordinator (for EPI as well as PHC activities), and consider establishing a communications budget of at least 2% of total immunization costs; and
- *Costing and budgeting*
WHO should assist countries in the costing and budgeting of immunization programmes, determining their economic base, assessing the benefits

that may be expected from the disease control initiatives and in mobilizing internal and external resources.

Sustainability of immunization services is endangered in situations of armed conflict. The GAG endorses the concept of "days of tranquillity and special relief corridors" for the benefit of children, to include immunization, as contained in the Declaration on the Survival, Protection and Development of Children.

Controlling the target diseases

Eradication of poliomyelitis

Trivalent oral polio vaccine remains the vaccine of choice for poliomyelitis eradication. Routine immunization with trivalent OPV will provide individual protection for most recipients and, if high coverage is achieved, will markedly reduce the incidence of acute poliomyelitis. However, in many countries, activities supplementary to routine services will be required if wild poliovirus eradication is to be reliably achieved by the year 2000. Such supplementary activities include "mopping-up" immunization activities in identified high risk or under-served areas along with the development of capabilities for outbreak investigation and control.

To reach high immunization coverage in all geographical areas in which the incidence of poliomyelitis and other EPI target diseases must be reduced, programme managers should plan accelerated immunization activities such as national or local immunization days, wherever indicated. The mass adminis-

tration of trivalent OPV to all children in an appropriate age range, within a limited period of time, is an effective way of eradicating wild poliovirus and is an epidemiologically sound policy. When accelerated immunization activities are conducted, all EPI vaccines should be used, including tetanus toxoid for women of child bearing age.

In countries where, for the greater part, poliomyelitis transmission has been interrupted, there may be some areas which continue to have a high risk of indigenous cases. Such areas would be indicated by: (1) currently reported cases of acute poliomyelitis, (2) the occurrence of recent cases, and (3) immunization coverage significantly below the national average. In these areas, "mopping-up" activities should be encouraged. These should incorporate the administration of all other EPI vaccines to all children (as needed) and tetanus toxoid to all women of child bearing age (as needed) who live in the area, on a house to house basis. Trivalent OPV should be given to all children of an epidemiologically appropriate age, usually 0-5 years, regardless of their existing immunization status. "Mopping-up" should be repeated 4-6 weeks later. These activities become important priorities for countries that are close to interrupting transmission of wild poliovirus.

As the incidence of poliomyelitis becomes relatively low, it becomes increasingly important to develop a policy and matching capability to respond to outbreaks. A prompt response to suspected polio cases includes case investigation, confirmation of the diagnosis and appropriate

immunization activities. As the number of cases continues to fall, collection of stool specimens from suspected cases and their close contacts and active surveillance for additional cases are recommended.

When an outbreak occurs in a country or area where few or no cases have been reported recently, all children in epidemiologically, geographically and age appropriate groups, usually 0-5 years, should receive trivalent OPV. In countries still reporting many cases, the immediate response will have to be more limited, but should at least include immunization of all children in an appropriate age group living in the village or ward of an urban area.

WHO should strengthen its capacity to conduct, coordinate and collaborate on research into polio related subjects, especially research with the potential to shorten the time required for eradication.

WHO should energetically pursue implementation of global and regional plans of action for the development of the laboratory networks required to support poliomyelitis eradication. Development of community based rehabilitation should be encouraged as an important element of the poliomyelitis eradication initiative.

Noting the data from the Region of the Americas suggesting improved epidemic control, and in view of the heat lability of trivalent OPV, the formulation of trivalent OPV with 10^6 , 10^5 and $10^{5.8}$ infectious units per dose for types 1, 2, and 3, respectively, with a balance of 10:1:6, is recommended as the minimum standard for trivalent OPV.

New information from the Region of the Americas on the differential diagnosis of flaccid paralysis should be integrated into global training materials.

Elimination of neonatal tetanus

The priority for all countries where neonatal tetanus remains is to rapidly increase tetanus toxoid protection in women of child bearing age. The number of neonatal tetanus deaths could be reduced by 300 000 by 1993 if all women were screened and appropriately immunized when they brought their children for immunization.

By the end of 1991, countries should identify high risk localities in which to implement neonatal tetanus elimination activities, having taken into consideration: (1) reported or estimated incidence, (2) size of the population at risk, and (3) the operational feasibility of any interventions.

In such high risk localities, women should be appropriately immunized whenever they have any contact with health care systems, at least when they bring a child for immunization or attend for antenatal care, unless they can show evidence of previous immunization. This will require technical assistance and necessary resources, training, sufficient tetanus toxoid and a life-time immunization card. During supervisory visits and programme reviews, the appropriate screening and immunization of women should be assessed.

Clean delivery interventions should be monitored utilizing rates of maternal mortality, antenatal care provision and the use of clean cord care kits.

Until 1993, protection of newborns from neonatal tetanus, by immunization

of their mothers with TT, should continue to be monitored by measurement of coverage levels of second or booster doses of tetanus toxoid in pregnant women. WHO should evaluate an indicator of children protected against neonatal tetanus, appropriate for the first DPT contact, for introduction before 1993.

The quality of tetanus toxoid must be assured by appropriate national quality control and by developing field methodologies for determining vaccine efficacy. Suitable chemical indicators (such as the STOP!Watch indicator) should be used at every storage point in the cold chain to warn of possible freezing of TT, as well as DPT, vaccines.

Measles reduction

Increasing immunization coverage along with improving disease surveillance are the two key elements to control measles and will achieve, by 1995, reduction by 95% in measles deaths and 90% in measles cases compared to pre-immunization levels. A sustained 90% reduction in measles incidence (from pre-immunization levels) will require high vaccine coverage at national, state/provincial and district levels and surveillance for the timely reporting of measles from all districts. In localities with high population densities, very high coverage rates will be needed to achieve this target.

Outbreaks must be expected even in programmes with relatively high coverage. A temporary period of low incidence will follow accelerated measles control activities, but outbreaks are still likely to occur because of the accumulation of susceptibles. It is only recommended to expend resources on exten-

sive outbreak control responses when immunization coverage is very high and mechanisms are in place to ensure that routine immunization of the target population is not jeopardized. Outbreaks should be analyzed to ensure that there is high vaccine efficacy and that immunization schedules and delivery strategies are epidemiologically appropriate. Such outbreaks may identify areas for "mopping-up" operations with all EPI vaccines, including tetanus toxoid for women of child bearing age, and may be an opportunity to secure the support of political leaders for further initiatives.

To meet the 95% mortality reduction target and to reduce morbidity associated with acute attacks of measles, treatment guidelines should be developed. As a priority, vitamin A should be administered in large doses to children with measles in high risk areas following the joint WHO/UNICEF guidelines to reduce post-measles deaths and complications (including blindness). Vitamin A administration should be considered as a routine part of the immunization programme in these high risk areas.

The minimum required potency of Edmonston-Zagreb measles vaccine for use at six months of age should be changed from 10^5 to $10^{4.7}$ infectious units per dose (as determined in parallel with the International Reference Reagent for measles vaccine).

Research into the control of measles should include the search for new vaccines, exploring alternative routes and strategies for administration, and identifying community barriers to immunization using social science techniques.

BCG vaccine and immunization policy

BCG should be given to newborns as protection against the most severe forms of childhood tuberculosis. BCG should continue to be given as early in life as possible in all populations at risk of tuberculosis infection. BCG scar sizes may be monitored during immunization coverage surveys to assess immunization techniques.

Immunization of infants suspected of being HIV infected continues to be recommended. BCG should be withheld only in cases of symptomatic HIV infection.

Research should be initiated or continued on the long-term effectiveness of BCG given in infancy, including the prevention of tuberculosis in adults who acquire HIV infection; the value of re-immunization; the efficacy of different seed lot vaccines; and the safety and efficacy of BCG in HIV infected infants.

Improving surveillance

Disease surveillance provides information on which planning and action can be based. Surveillance is a management necessity to measure progress towards disease eradication, elimination and reduction and to direct programme resources to the areas of greatest need. Effective surveillance identifies needs for programme improvement, serves as a tool for motivation of involved staff, and assists in sustaining political will for immunization.

Surveillance should be developed through strengthening of routine

systems. Only a selected number of high priority infectious diseases should be notifiable. Monthly, and eventually weekly, reports should be submitted in a timely manner from all health units. A system should be established to investigate late or absent reports. Notifiable diseases of high importance (including poliomyelitis and neonatal tetanus in areas where these diseases are close to eradication or elimination, respectively) should be reported immediately to the level where action is to be taken. WHO should develop guidelines on surveillance of preventable infectious diseases, including the EPI target diseases.

Managers should actively promote indicators to assess progress in surveillance, outbreak or case investigation and institution of control measures. Indicators should be developed to allow comparison over time and between geographic areas.

For poliomyelitis, surveillance should aim to detect all cases of flaccid paralysis as early after onset as possible. The diagnosis of poliomyelitis should be made by the most expert appropriate person. Laboratory services should be available for virus identification. Surveillance should form the basis for national and local poliomyelitis eradication strategies.

To monitor the reduction in neonatal tetanus incidence, and to ensure the accuracy of routine reporting, the following should be performed in high risk areas:

- Review records at health services, particularly hospital and peripheral health facilities, at least once a year during supervisory visits or annual programme reviews;

- Establish and maintain a "vital event" registry at the community level which includes lists of pregnant women, birth outcomes, neonatal deaths by age in days, and maternal deaths. Such registration should eventually become routine in all areas;
- Train immunization, MCH and curative staff, particularly at district level, in case investigation and review processes, to improve their knowledge of neonatal tetanus, record keeping and the use of surveillance data at local level; and
- WHO should develop a set of guidelines to certify neonatal tetanus elimination in country or in a district of a country.

The usefulness of computerized EPI information systems is reaffirmed as important management tools for disease surveillance as well as monitoring immunization coverage.

Inclusion of existing vaccines and introduction of new or improved vaccines

The GAG welcomed and endorsed the Children's Vaccine Initiative enunciated in the Declaration of New York on 10 September 1990: this envisions the development of vaccines which require fewer doses, can be given earlier in life, can be combined, are more heat stable, and are affordable.

Yellow fever vaccine

Yellow fever endemic countries of the African and Eastern Mediterranean Regions should incorporate yellow fever vaccine in their routine immunization

programmes. Yellow fever vaccine is recommended for use from 6 months of age and can be administered at the same time as measles, polio (OPV or IPV), DPT, BCG, and/or Hepatitis B vaccines. Inclusion of older age groups may be appropriate in areas where yellow fever epidemics are occurring or considered a high risk. Countries that include yellow fever vaccine in their immunization programmes should monitor immunization coverage and disease incidence.

Many countries that need yellow fever vaccine most are not able to purchase this vaccine. It is not yet included by UNICEF in its routine programme of assistance. Recognizing that the total funds to provide yellow fever vaccine for all infants in endemic countries are estimated to be less than US\$ 4 million per year, WHO is urged to work with donors to obtain funding for purchase of yellow fever vaccines.

Yellow fever vaccines should meet WHO requirements and WHO should exercise its special powers mandated by the World Health Assembly to monitor yellow fever vaccine quality.

Hepatitis B vaccine

Hepatitis B vaccine has been shown to be stable, safe, immunogenic and effective. There are no technical or scientific impediments to its immediate use. Indeed, the scale of the global problem of hepatitis B virus infection makes its use a matter of urgency. The paramount task is to develop national programmes and obtain financial resources to provide this important vaccine to the world's children.

Global control of hepatitis B is now feasible and it is recommended that WHO work towards the following targets:

- As a means of long term control of hepatitis B virus infection, all infants should be immunized through complete integration of hepatitis B vaccine into immunization programmes;
- As a first step, national programmes could introduce hepatitis B vaccine by immunizing selected subgroups of infants according to the epidemiological situation. In areas of high or intermediate hepatitis B virus endemicity (Hepatitis B carrier prevalence of 2% or greater) immunization could be initiated in selected geographic areas with a well established immunization infrastructure. In areas of lower endemicity, infants of ethnic or other high risk groups with higher endemicity could be immunized before universal infant immunization is introduced;
- Reduction in price of hepatitis B vaccine and development, in collaboration with UNICEF, of a global revolving fund for hepatitis B vaccine procurement;
- Promoting appropriate local production of hepatitis B vaccine through transfer of technology, when financially appropriate;
- Development of hepatitis B vaccines that are effective with a single injection and are stable outside the cold chain as part of the Children's Vaccine Initiative; and
- Continue research and develop guidelines on the introduction of

hepatitis B vaccine into routine immunization programmes. Efforts must also continue to investigate its combination with other vaccines, determine the most cost effective strategies for its delivery and lower the costs of production.

Promoting other Primary Health Care practices: micronutrient supplementation

Some 500 million contacts with infants occur each year through immunization programmes. All countries where there are serious vitamin A or iodine deficiency problems should consider taking advantage of these contacts with children and women of child bearing age to deliver vitamin A and iodine supplements.

Previous recommendations for vitamin A and iodine supplementation through immunization programmes are reaffirmed. WHO is urged to determine the appropriateness of incorporating vitamin A within national immunization schedules at each of the DPT contacts in the first year of life. Training and supervision manuals as well as suitable indicators for monitoring and evaluation of vitamin A and iodine

supplementation delivery should be developed.

Specialized topics

Monitoring of adverse events following immunization: All immunization programmes should monitor adverse events following immunization, the extent depending on the priorities of the programme. WHO should assist in the standardization of definitions of adverse events, develop field guides and training materials, develop guidelines for monitoring adverse events in routine immunization programmes, disseminate data on adverse events available from specialized monitoring activities and provide materials on the risks and benefits of immunization.

Cold chain and logistics: Individual vial thermal exposure indicators should be introduced as soon as manufacturers confirm that the response of such indicators satisfactorily mimics the stability of the vaccines. The first priority should be for trivalent OPV in view of its thermolability.

Autodestruct syringes, as they become available, should be promoted in areas where single use syringes are being used.

3.

GLOBAL OVERVIEW: A SUMMARY OF GLOBAL AND REGIONAL PROGRAMMES

Immunization programmes in developing countries have made remarkable progress since the inception of the Expanded Programme on Immunization in 1974 when it was estimated that less than 5% of the world's children were adequately immunized. Today, some 70% are being reached with a protective course of immunization by the first year of life (Figure 1). The development of the capacity to achieve these levels of coverage of infants represents a major public health triumph in the decade of the 1980s.

At the present levels of immunization coverage, it is estimated that some 2.6 million deaths annually from measles, neonatal tetanus and whooping cough are prevented (Figure 2). In addition, some 410 000 cases of paralytic poliomyelitis are being averted each year.

The lowest coverage rates continue to be documented for tetanus toxoid (TT) among pregnant women: in developing countries, only 31% are reported as having received two or more doses. Technical problems remain in accurately determining this coverage rate for different target groups for tetanus toxoid immunization. It is certainly an underestimate of actual tetanus protection, as doses of tetanus toxoid administered before the most recent pregnancy have not generally been considered in assessing immune status. Nevertheless, it

is equally certain that tetanus toxoid coverage remains far too low (Figure 3).

The need for further acceleration and expansion of immunization activities in the decade of the 1990s, from ensuring optimal delivery strategies to improvement and development of new vaccines, is underlined by the continuing tragedy of vaccine-preventable suffering, disability and death. Universal immunization coverage could prevent, each year, an additional 2.6 million deaths due to measles (1 400 000), neonatal tetanus (770 000) and whooping cough (490 000) as well as over 180 000 cases of paralytic poliomyelitis (Figure 2).

It should be emphasized that the progress of the EPI is directly attributable to the efforts Member States, WHO, UNICEF and other United Nations Agencies, bilateral development agencies, and non-governmental organizations. These organizations have built a coalition to implement the activities required to achieve and sustain the goal of reducing morbidity and mortality by providing immunization services for all children of the world.

Report from the EPI Research and Development Group

A report on the proceedings of the 7th EPI R&D Group Meeting held in

Figure 1

Estimated immunization coverage with BCG, DPT, poliomyelitis, measles and tetanus vaccines based on data available as of 4 December 1990.

Country	Newborns surviving to 1 year of age (millions)	Cumulative % of surviving infants	Immunization coverage (%)				
			Children less than 1 year of age				Pregnant women
Developing countries ranked by surviving infants			BCG	DPT3	Polio3	Measles*	Tetanus2
1 India (9)	24.10	20	80	79	74	56	67
2 China (9S)	22.22	39	98	95	95	95	-
3 Pakistan (9)	4.98	43	78	73	73	65	35
4 Nigeria (8S&9S)	4.87	47	76	47	47	31	16
5 Indonesia (9)	4.46	51	81	71	74	65	41
6 Bangladesh (9)	4.18	54	98	54	53	58	37
7 Brazil (7&9)	3.95	58	70	54	97	58	62
8 Mexico (7&9)	2.40	60	80	65	96	85*	42
9 Iran (9)	2.18	61	90	89	89	89	43
10 Philippines (9)	1.93	63	89	79	78	83	43
11 Viet Nam (9)	1.92	65	94	88	89	89	18
12 Egypt (9)	1.74	66	78	85	85	87	24
13 Ethiopia (9)	1.69	67	44	26	26	23	24
14 Zaire (7&8)	1.43	69	57	38	38	41	29
15 Turkey (9)	1.43	70	48	74	74	67	-
16 Kenya (7S)	1.21	71	86	75	75	60	37
17 Tanzania (9S)	1.19	72	93	85	82	83	42
18 Thailand (9)	1.18	73	98	84	84	66	70
19 Myanmar (9)	1.16	74	66	50	45	50	42
20 South Africa	1.01	75	-	-	-	-	-
21 Sudan (9)	0.97	76	51	41	41	34	28
22 Algeria (9S)	0.92	76	91	85	85	81	7
23 Colombia (9)	0.87	77	90	75	93	73	40
24 Morocco (9)	0.79	78	91	80	89	82	64
25 Rep. of Korea (8)	0.79	78	70	89	89	95*	-
26 Argentina (9)	0.66	79	94	74	81	79*	-
26 countries	94.23	79	84	75	77	68	35
Other developing countries	25.21	21	69	53	55	56	24
Total developing countries	119.44	100	81	71	73	66	31
Total industrialized countries	17.35		85	86	88	82	-
Global Total	136.78		81	72	74	68	27

* Up to 2 years of age

(7) 1987 reported data (8) 1988 reported data (9) 1989 reported data (S) Survey data - No information available

Cairo, Egypt on 10-11 October 1990, was presented.

The R&D Group reviewed research in six principal areas: measles, polio, bioengineering, neonatal tetanus, tuberculosis and HIV. In addition, there were reports on a meeting on research for new measles vaccines and on the 6th International Symposium on Pertussis.

Data arising from R&D activities of the EPI has been extremely useful in charting programmatic activities and has served as a basis for many of the Global Advisory Group's recommendations.

Research activities of the EPI are governed by questions arising from the field. The R&D Group reemphasized the need for operational and epidemiologic investigations. These include efforts to evaluate the effectiveness of different strategies in the eradication and/or control of vaccine-preventable diseases, to examine methods of improving surveillance and identify potential

difficulties in the reporting mechanism and to examine the safety, immunogenicity and efficacy of vaccines being considered for introduction into the EPI, when mixed or administered simultaneously with currently used vaccines.

The R&D Group reaffirmed that the trivalent OPV should remain the primary vaccine used in the global polio eradication effort.

Efforts to coordinate and facilitate research activities with other units within WHO continue to be pursued. Liaison between the R&D Group and the Scientific Advisory Group of Experts (SAGE) of the WHO Programme for Vaccine Development has been useful, particularly in bringing the practical field needs of EPI to groups working in the more basic areas of polio, measles and tetanus vaccine development.

The R&D Group endorsed the Children's Vaccine Initiative as promulgated by the Declaration of New York

Figure 2
Death and disease prevented by the Expanded Programme on Immunization

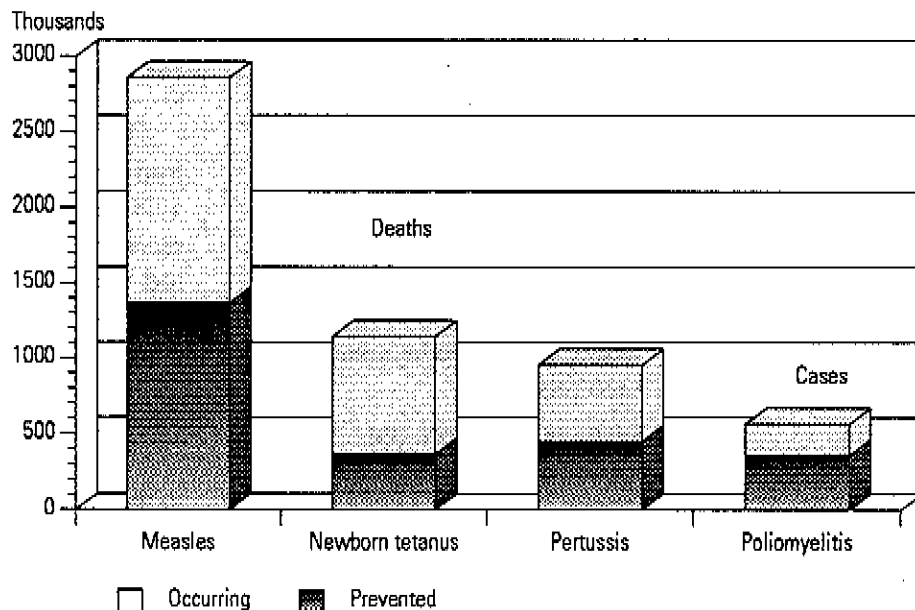
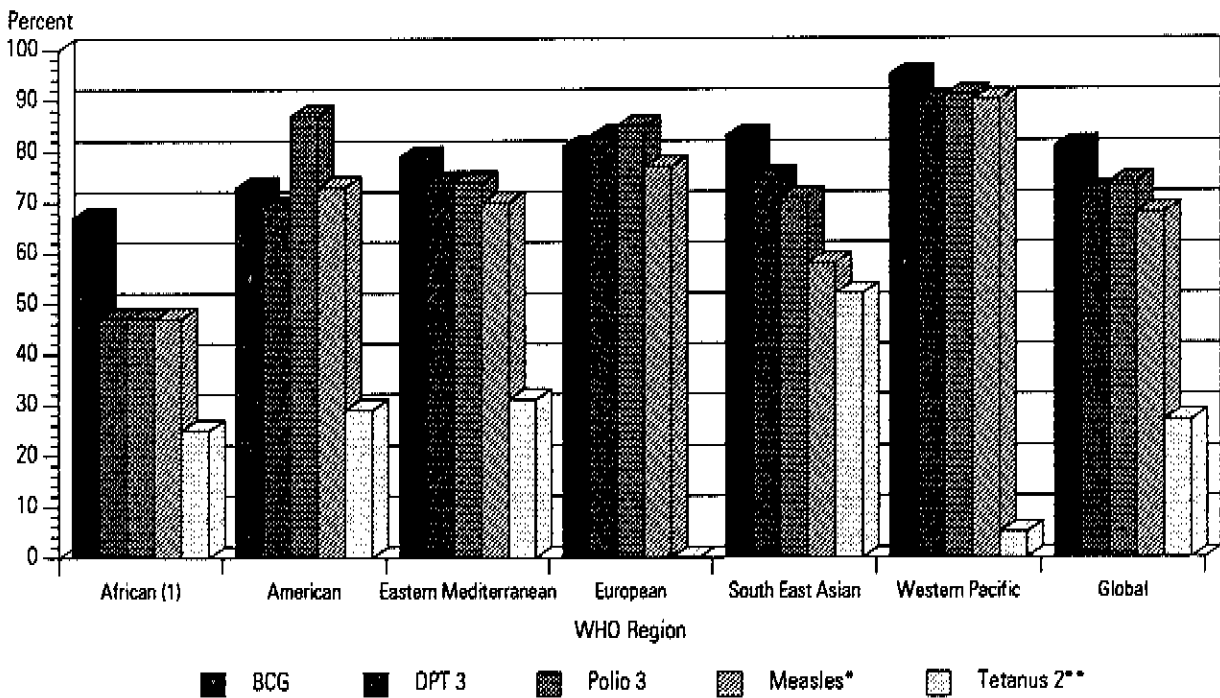


Figure 3

Estimated percentage of children immunized in the first year of life and percentage of pregnant women immunized against tetanus by WHO Region, based on information available, June 1990.



* Coverage data for children up to 60 months are included for countries recommending immunization at, or later than, 12 months.

** Boosters included.

(1) Excluding South Africa

and subscribed to the approach of moving toward that goal through a series of sequential vaccine improvements which emphasize the development of vaccines which:

- require one or two rather than multiple doses;
- can be given earlier in life;
- can be combined in novel ways to reduce the number of injections or visits required;
- are more heat stable; and
- are affordable.

Report on the World Summit for Children

The World Summit for Children was held in New York on 29 - 30 September 1990. Seventy-one heads of state and representatives from 69 other countries met to review problems related to providing adequate conditions for the growth and survival of the world's children. This meeting was important for many reasons. First, it initiated or accelerated programmes which related to the plight of children. Second, it focused world attention on the predica-

ment faced by many of the world's children and stimulated the search for solutions. Third, it concentrated the attention of the scientific community to this problem. Lastly, and perhaps most important, it resulted in a global political commitment, bringing together leaders and representatives from the majority of the world's countries, each of whom spoke on the situation of children in their country and dedicated themselves and their countries to the global betterment of the lives of children.

A video tape provided by UNICEF entitled "341" was presented. This figure represents the number of children who are expected to die due to vaccine preventable diseases during the 12 minutes running time of the video.

Achieving and sustaining Universal Child Immunization

The progress of the EPI has been made possible, in part, through the politicization of child immunization in most developing countries during the period of 1984 to 1990. This initiative has resulted in an improved cold chain and the capacity of the health service has been extended to reach nearly all communities; the awareness of the need and importance of immunization by families and community leaders has become nearly universal through the use of social mobilization techniques which were never before applied on a massive scale.

Even though the achievements of the 1980s have resulted in the saving of millions of lives (some 2.6 million during 1990), another 2.6 million children are still dying from vaccine-preventable diseases. A goal of maintain-

ing the status quo or "sustaining" the achievement of 1990 would translate into over 20 million deaths averted by the year 2000. Therefore, the disease eradication, elimination and reduction goals will be the motor of progress during the next decade. They will be a tool for measuring outcome or impact and will be a vehicle to assure improvement in the quality of service. The decade could be characterized as "*the decade of the epidemiologist*" with special emphasis upon surveillance with more sophisticated management information systems, diagnostics, and rapid outbreak control.

The goal of universal child immunization means *all* children and we must continue to strive to reach that standard. Even though national or global coverage will be difficult to push above 90%, for a village with 100 births annually, true universal coverage is possible, but must be a standard for both the community and the local health worker. Perhaps the strongest incentive or tool to reach universality is to personalize the goal. The target is not 100 children, but 100 unique individuals with names and families who love and care for them.

Although immunization coverage alone will not be the primary performance indicator as during the 1980s, it must continue to be closely monitored at all levels as it is the basis for disease control.

The immunization goals for the 1990s are clear and have been endorsed by the World Health Assembly, the UNICEF Executive Board, the UN General Assembly and most recently by the World Summit for Children. This commitment is based upon the accep-

tance of a new ethic expressed as *"first call for children"* or that the essential needs of children should be given the first priority in allocating resources in bad times as well as in good times, at national and international as well as at family level.

A high level of political commitment can only be maintained through careful monitoring of progress towards the goals, and improved efficiency and cost-effectiveness. Management of the programme must be improved through better training and supervision. This includes vaccine stock management, cold chain maintenance, sterilization, vaccine handling, injection techniques, and recording and reporting. The Children's Vaccine Initiative will contribute to efficiency and cost-effectiveness. It is critical that all new or improved vaccines are available at affordable costs and that the understanding is increased of the value of complete and timely immunization by parents and community leaders. It must become unacceptable for any child in a community to die of neonatal tetanus, measles or pertussis or to be paralysed by polio. Active community surveillance must be a goal.

It is clear that at least current levels of investment will be required for most of the decade. UNICEF has invested nearly 500 million dollars between 1980 and 1990 and expects to further expend one billion dollars throughout the decade of the 1990s on immunization activities. It is hoped that a larger share of the burden of funding can be absorbed by national budgets through more effective management and setting better priorities of resources for health and education and within the health sector towards preventive services.

However, the least developed countries which are experiencing extreme financial and economic hardship will require continuing high levels of support from the donor community. It must be clear that 15 U.S. dollars per fully immunized child is ultimately affordable to any country if the political priority is there.

During 1990, immunization activities will bring 100 million infants into contact with the health system 5 times. These 500 million contacts provide an opportunity to deliver other services such as vitamin A or iodine supplementation, growth monitoring and other services provided in a "well baby clinic".

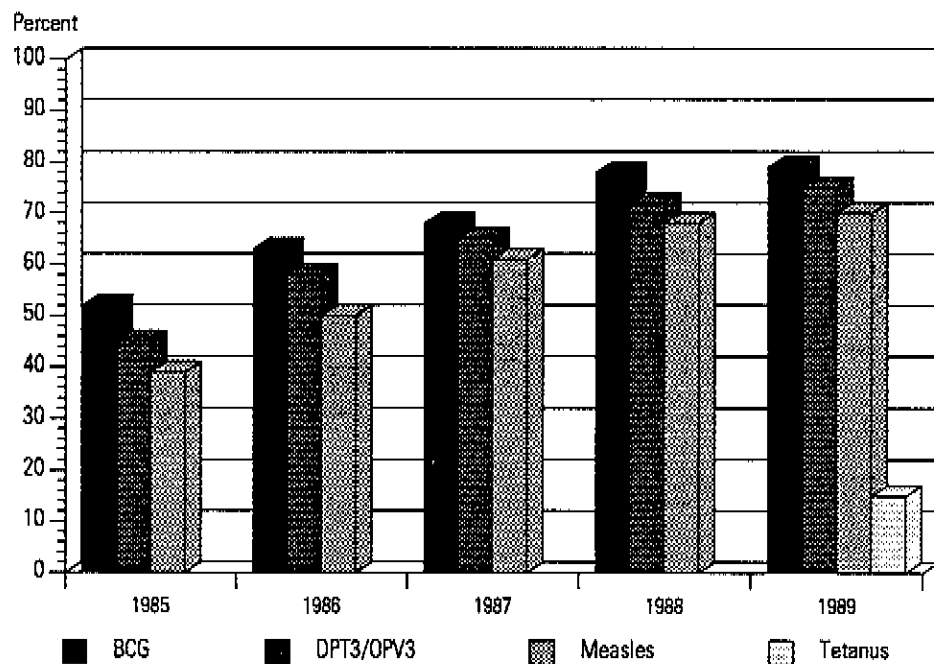
Summary of Regional Programmes

Eastern Mediterranean Region

EPI in the Eastern Mediterranean Region continued to achieve steady progress during 1989. The regional average reported immunization coverage among infants by their first birthday was 80% for BCG, 75% for DPT3/OPV3 and 70% for measles. For tetanus toxoid immunization, the reported coverage during 1989 was 30% for pregnant women, and 15% for women of child bearing age. The Regional average of drop-out rate from the first to third dose of DPT/OPV among infants was 10% (Figure 4).

Eighteen countries with over 81% of the Region's infant population have reported achieving DPT3/OPV3 immunization coverage of 70% or higher. However, in Afghanistan, Lebanon, Somalia, and Sudan DPT3/OPV3 coverage in 1989 was still lower than 50%.

Figure 4
Reported annual immunization coverage in the Eastern Mediterranean, 1985 – 1989



Surveillance for the EPI diseases in the Eastern Mediterranean Region remains inadequate for monitoring the impact of immunization in terms of disease reduction. However, some Member States have developed excellent surveillance systems. Data from the Region can demonstrate a consistent trend during the past 5 years in reduction in the reported annual incidence of the EPI target diseases, especially neonatal tetanus (Figure 5).

As a first step toward strengthening laboratory support services for polio eradication, three regional reference laboratories and six national laboratories have been identified. Concerted efforts are being pursued to upgrade these laboratories and to conduct staff training. The WHO/EMRO Manual for Health Workers on Polio Eradication has been widely distributed to all Member States.

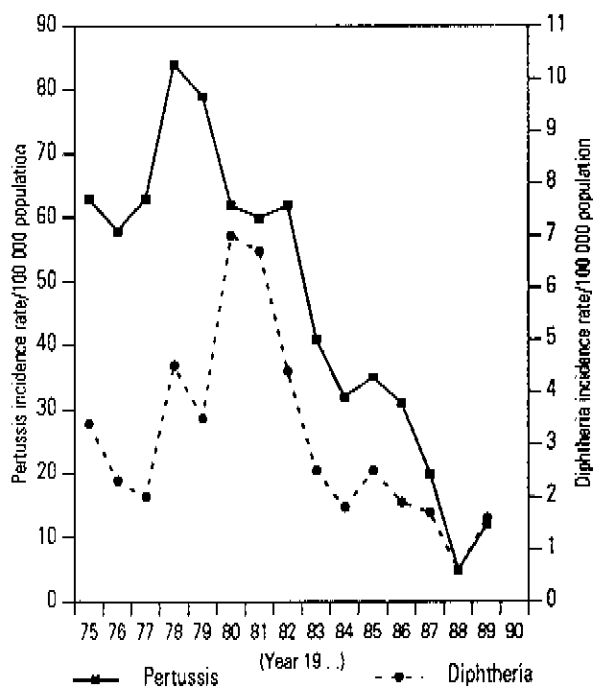
To improve programme performance, an increasing number of countries in the Region have conducted various operational research activities (Figure 6).

Programme activities in the Region are now focused on :

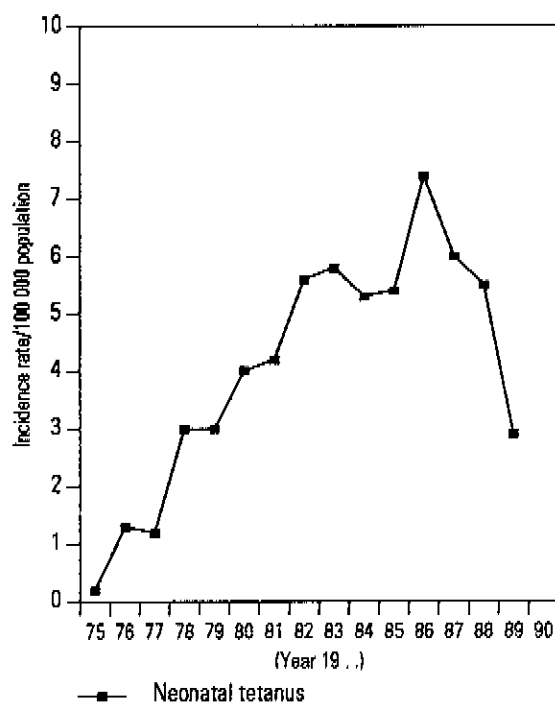
- identifying and sustaining high levels of immunization coverage, especially among the undeserved in urban areas, displaced population groups, nomads, and refugees;
- reducing missed opportunities and drop-out rates; and
- improving disease surveillance systems.

Continued efforts have been made to ensure sustainability of the programme at the Regional level and within countries with the support of UNICEF and other collaborating agencies.

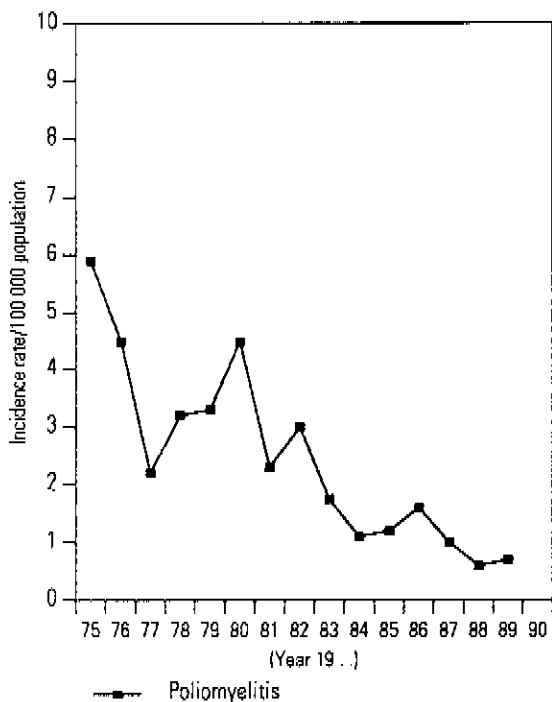
Figure 5
Reported incidence rates of Pertussis and Diphtheria
in the Eastern Mediterranean, 1975–1989



Reported incidence of neonatal tetanus in the Eastern Mediterranean, 1975–1989



Reported incidence of poliomyelitis in the Eastern Mediterranean, 1975–1989



Reported incidence rates of measles in the Eastern Mediterranean, 1975–1989

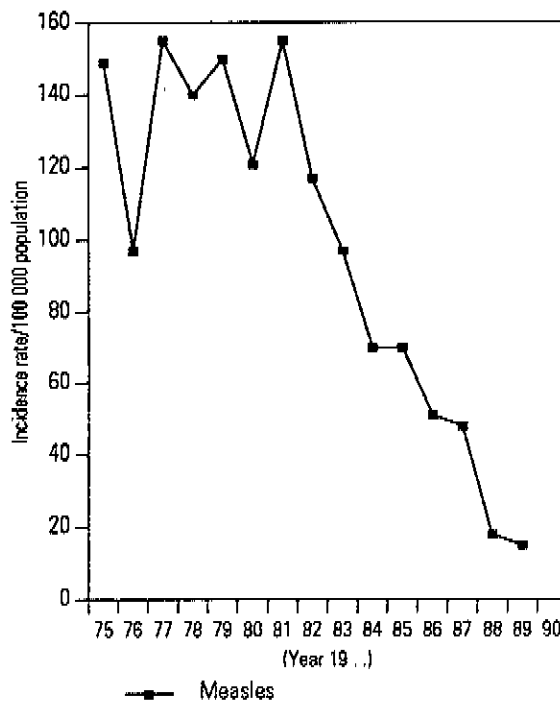


Figure 6
Operational research activities conducted in countries of the Eastern Mediterranean Region, 1989

Topics	Country
Missed opportunities for immunization	Djibouti, Egypt, Pakistan, Oman, Tunisia
Neonatal tetanus mortality surveys	Syria, Tunisia
Serological response to trivalent OPV immunization	Pakistan, Oman
Survey of post-BCG lymphadenitis	Iraq, Libya
Field test of auto-destruct syringes	Pakistan
Field test of solar sterilizers	Tunisia
Seroprevalence of HBV infection	Djibouti
Demonstration site for introducing hepatitis B vaccine in EPI	Jordan, Iran, Pakistan

Intercountry and interagency coordination in the Eastern Mediterranean Region are progressing well. Annual intercountry meetings for EPI managers provide a forum at which the programme is extensively reviewed, experiences exchanged, constraints identified, and solutions recommended.

The prospect of routine immunization against hepatitis B in the Region is encouraging. A number of countries have already introduced Hepatitis B vaccine into their national EPI following the schedule recommended by WHO. A Regional plan of action for the control of hepatitis B has been developed. Demonstration areas in three countries of the Region are progressing well and these sites are expected to provide information on methods of adding Hepatitis B vaccine into the EPI.

Computer technology has been widely used in many Member States to monitor immunization coverage and disease incidence, as well as for analysis of immunization coverage surveys.

African Region

Emphasis in the African Region is being given to the EPI target diseases,

especially neonatal tetanus, poliomyelitis and measles. Improvements in immunization coverage are encouraged (Figure 7).

Increases in immunization coverage were modest during the year. BCG vaccine had the largest increase. Immunization coverage data for the African Region among infants by their first birthday, based on reports to WHO/AFRO as of December 1989 and July 1990 are as follows:

	BCG	DPT 3	OPV 3	Measles	TT 2
1989	60%	45%	44%	45%	24%
1990	67%	47%	47%	47%	25%

Immunization coverage for OPV 3:

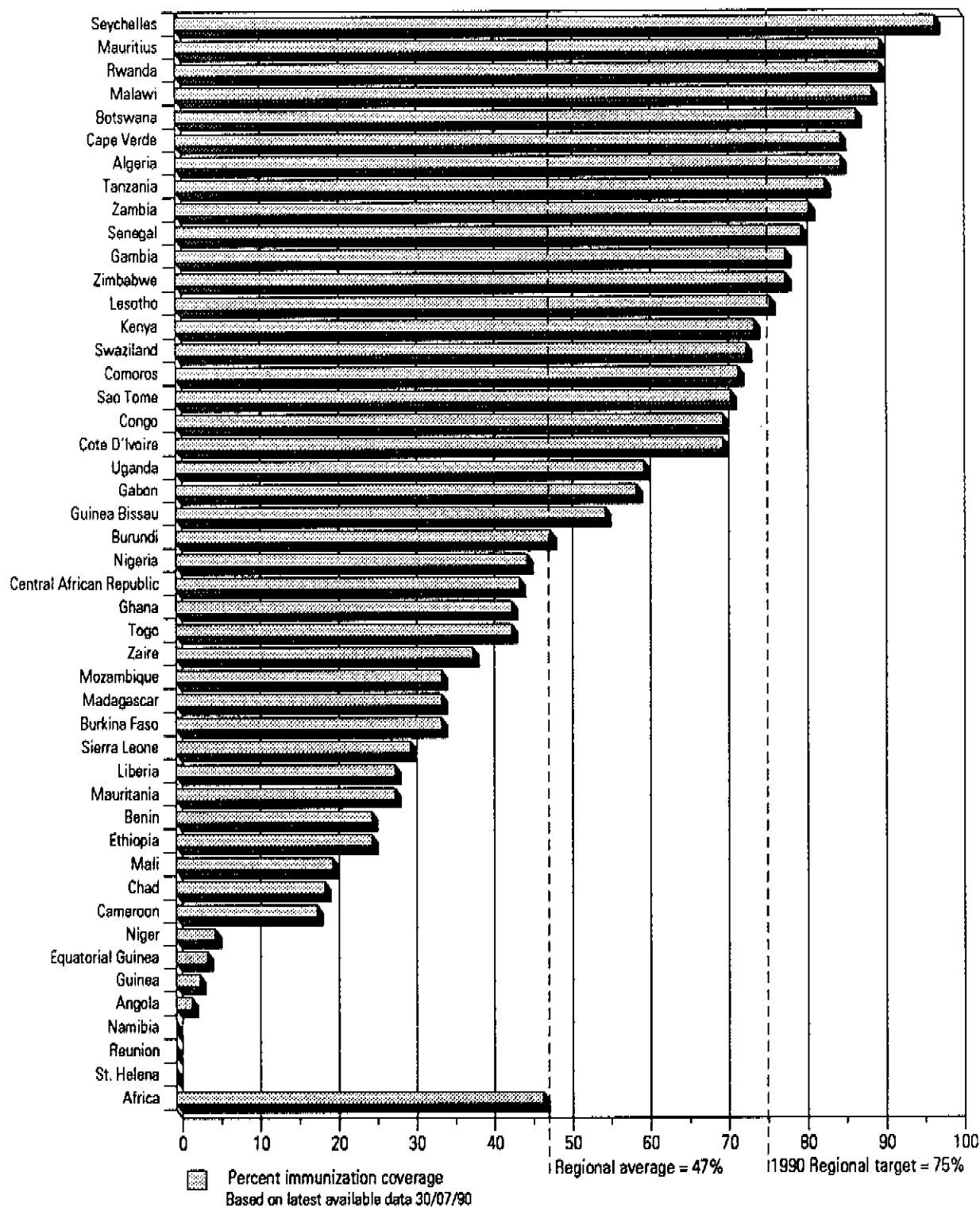
Greater than 75%:
 15 countries; 23% of African Regional population

50%-74%:
 6 countries; 7% of African Regional population

Less than 50%:
 22 countries; 70% of African Regional population

A regional plan of action for polio eradication was developed in July 1989.

Figure 7
OPV-3 Immunization coverage in infants, Africa Region 1990



Sixteen national plans of action were developed at a meeting in July 1990. Further plans will be developed at meetings in Lome (November 1990), Bujumbura (January 1991) and for Lusophone countries at a date yet to be fixed. Twenty-one countries reported 656 cases of poliomyelitis during 1989; eight countries reported zero cases; other countries are late in reporting.

Plans of action for the elimination of neonatal tetanus have been developed at 5 workshops for 42 countries in the Region. The implementation of these plans is being monitored at meetings of programme managers and by the person assigned responsibility for neonatal tetanus in the regional programme. Seven surveys of vaccine coverage made during the year showed higher TT2 coverage than those reported by the routine reporting system.

The Technical Group on Immunization, a group of WHO, UNICEF and EPI donors, held its annual meeting in August. This meeting also coordinates the support by donors to national programmes.

Hepatitis B vaccine has been introduced into three national programmes and four other countries plan to do so. A conference will be held in Cameroon in February 1991 to review the epidemiological situation and the use of Hepatitis B vaccine in the EPI.

Training activities in cold chain and logistics have continued, especially for solar energy refrigeration. There are now nearly 1 000 solar-powered refrigerators in the Region. Regional staff attended the EPI Cold Chain meeting on the TECHNET system in Cyprus.

Nineteen countries have installed the Computerized EPI Information System (CEIS) in their national programmes. It is hoped to have the system installed in most of the countries of the Region by the end of 1991.

In the majority of countries, future activities will focus on increasing coverage for all EPI vaccines and on sustaining national immunization programmes through:

- improving and maintaining levels of immunization coverage;
- conducting surveillance of target diseases, with priority for neonatal tetanus and poliomyelitis;
- continuing development of cold chain and logistics systems; and
- installation of CEIS in all national programmes.

Region of the Americas

Building self-sustaining immunization activities in the countries of the Americas is one of the strategic orientations and priority programmes of the Pan American Health Organization. This goal was reaffirmed by the Pan American Sanitary Conference in Washington, D.C., in September, 1990.

In the Americas, immunization coverage in children under one year of age, reached an all time high in 1989, of over 60% for all of the vaccines included in the EPI.

Measles, diphtheria, whooping cough, tetanus, including neonatal tetanus, and tuberculosis have experienced a steady decline over the last few years, and poliomyelitis is on the verge of being eradicated.

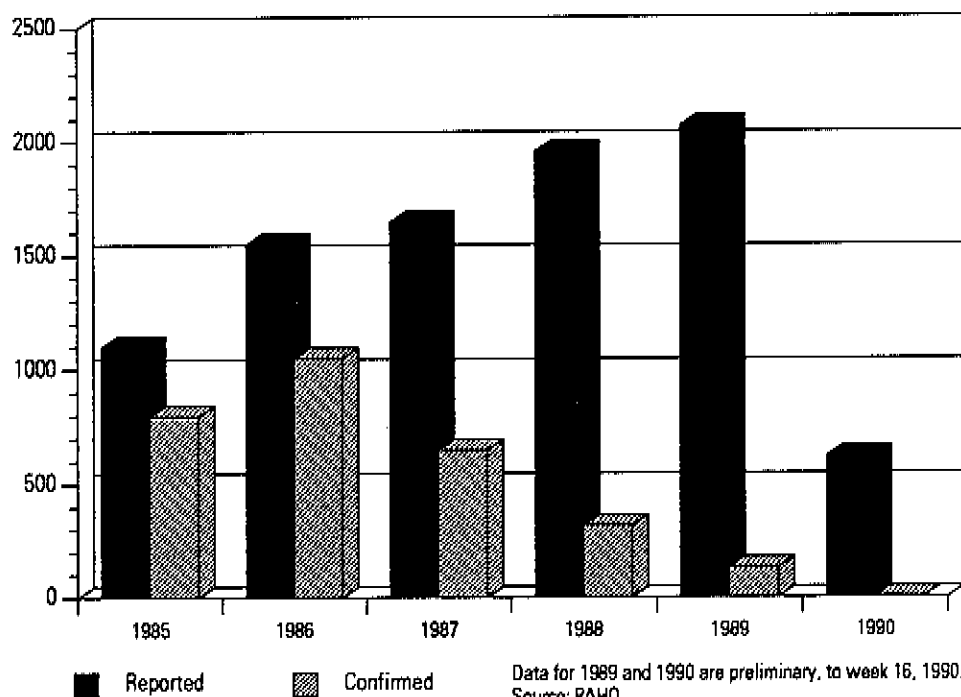
The policies for immunization have relied on a mixture of systems including delivery through fixed health facilities, outreach mobile units, and national, regional or local immunization days, usually implemented twice a year, four to six weeks apart. The policies have emphasized that all these approaches should contribute to the development of the health infrastructure, with the national immunization days complementing routine vaccine delivery, especially in the polio-endemic countries. In addition, supplementary "mopping up" operations have been carried out, specially in the peri-urban and other under-served areas. OPV vaccine is given in the areas of persistent polio transmission to all children under five years of age, regardless of previous immunization status.

By the end of 1989, over 2.8 million households had been visited and over 3.6 million children had received OPV vaccine in mopping up operations, each one normally implemented twice, one month apart.

By the end of 1989, 130 cases of polio were confirmed in the American Region, representing a decline of 62% from the 340 cases confirmed in the previous year. Twenty-four of the 130 cases had wild poliovirus recovered from stool samples. In 1990, as of week No. 40, ending 6 October, 1990, only four cases confirmed with wild poliovirus were detected in the Region: one in Peru, one in Ecuador and two in Mexico (Figure 8).

Surveillance was strengthened with the poliomyelitis eradication initiative

Figure 8
Polio: Reported and confirmed cases, Americas, 1985 - 1990



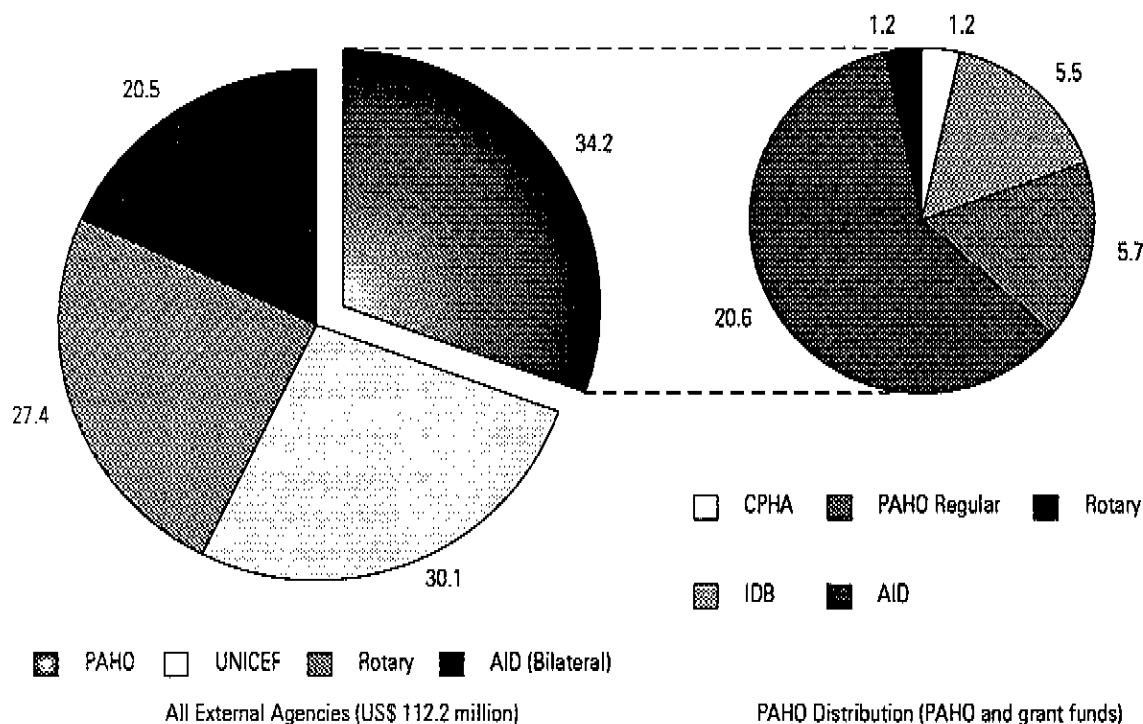
and currently there are over 15 000 health facilities that report weekly on the presence or absence of polio suspect cases. This system has helped improve surveillance activities for the other vaccine-preventable diseases, particularly for measles and neonatal tetanus. A network of diagnostic laboratories is operational.

The success of the countries of the Americas in increasing immunization coverage, reducing disease incidence and nearly eradicating polio is due to their high level of commitment and in great part to the outstanding level of coordination achieved by an Inter-Agency Coordinating Committee (ICC). This was formed by the various agencies that are supporting the programme, namely the USAID, UNICEF, the Inter-American Development Bank, Rotary

International and the Canadian Public Health Association (CPHA), which, together with PAHO, have contributed over US\$112 million for the period of 1987-1991. These international resources helped mobilize another US\$430 million from the recipient countries, in a demonstration of the commitment of these countries to achieve these targets (Figure 9).

These successes have motivated a Resolution by the Pan American Sanitary Conference in September 1990, to launch a follow-up phase for these activities, with the goals of consolidating the eradication of polio, eliminating neonatal tetanus by 1995 and further controlling measles. All countries of the Region have identified the areas at risk for neonatal tetanus. Immunization of women of child bearing age is already

Figure 9
EPI in the Americas: Contributions from External Agencies 1987 - 1991 (in millions US\$)



under way in many of them and special strategies for measles control are being tried in the English speaking Caribbean countries with the aim of eliminating measles transmission by 1995. It is estimated that some US\$100 million will be required from the ICC member agencies, who have already pledged support for 1991-1995. Strategies for this new phase will rely on further strengthening of surveillance systems and of the accelerated immunization strategies that proved to be so effective in the previous phase.

It is also expected that new vaccines will be added, such as measles, mumps and rubella (MMR) and Hepatitis B vaccines, that so far have had limited use in the Americas.

European Region

The importance of immunization programmes in the European Region was unanimously recognized by the 40th Session of the Regional Committee (September 1990), which requested that the Regional Director increase the budget planned for immunization activities.

Immunization coverage is generally high in the Region. European children were well-protected in 1989 against poliomyelitis, with the exception of a few areas of the USSR and Turkey. More than 80% of children have received a primary course of DPT, except in the German Federal Republic, Ireland, Italy, Luxembourg, Malta, Spain, Sweden, Turkey and the USSR.

The recent introduction of MMR vaccine in the immunization schedules of 18 European Member States has led to increased coverage with these vac-

cines. In the United Kingdom, the coverage with MMR vaccine reached 90% during the past two years.

Surveillance efforts are improving for the six EPI target diseases, and also for mumps, rubella, hepatitis B, and pulmonary tuberculosis. During 1989 there was a two-fold decline in the number of poliomyelitis cases reported in the Region, probably attributable to accelerated immunization activities in Israel, Turkey and the USSR.

Intensified surveillance has also identified outbreaks of poliomyelitis and diphtheria in the USSR and Turkey, persisting epidemics of pertussis in Sweden, recent large outbreaks of measles in France, Albania, Hungary and Finland, and cases of neonatal tetanus in Turkey (Figures 10 and 11).

Community based computer systems for EPI are functioning successfully in the Netherlands and the United Kingdom. The Computerized EPI Information System has been installed in the Regional Office and in Czechoslovakia and Turkey.

Immediate actions are requested of Member States to solve problems in the following areas:

- funding,
- vaccine production and supply,
- cold chain,
- increasing immunization coverage,
- improving surveillance,
- developing intercountry and national training facilities for continuing education of medical professionals in the field of immunization, and
- increasing communication activities.

Figure 10
Incidence of poliomyelitis, European Region 1974-1989

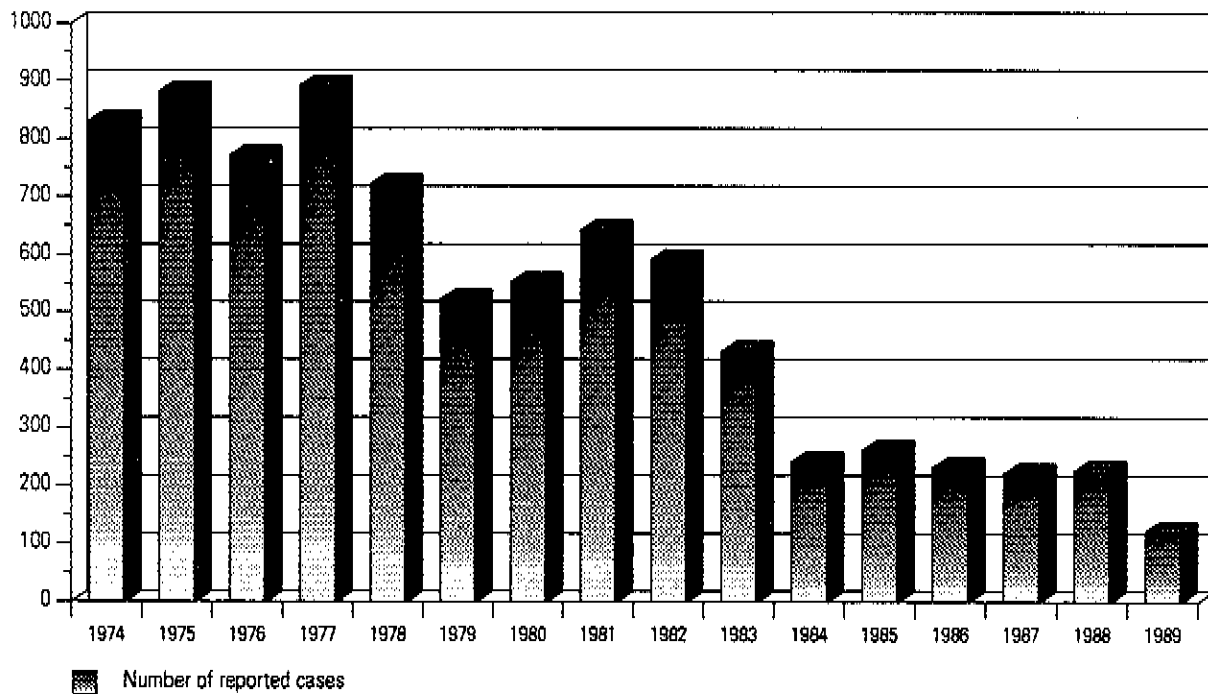
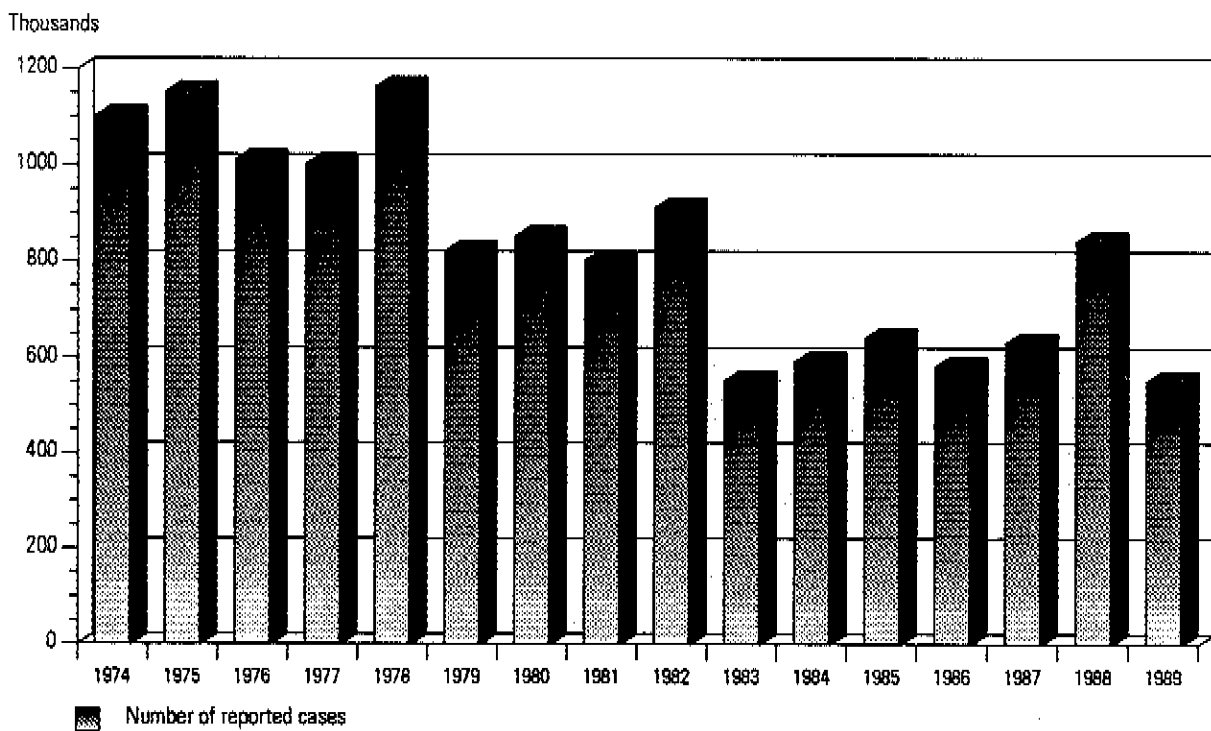


Figure 11
Incidence of Measles, European Region 1974 - 1989



South-East Asia Region

At least 5 out of the 11 Member States in the South East Asia Region will achieve or surpass 80% immunization coverage of their children by the end of 1990.

Immunization coverage for the Region by the end of 1989 was: BCG 83%, DPT3 75%, OPV3 72%, and measles 59%. The figures for tetanus toxoid were, however, lower (Figure 12).

A dramatic reduction of EPI target diseases has not yet been observed, although there has been a perceptible downward trend in reported cases for the last 9 years. Reporting of neonatal tetanus was improved in 1989, and this may explain the sudden increase in the total number of reported cases of this disease (Figure 13).

Concerning the targets for poliomyelitis eradication, neonatal tetanus elimination and measles reduction,

national plans of action have been developed and measures are well underway. Laboratories have been identified to support polio surveillance. Coordination between MCH services and EPI is being promoted as an essential element in neonatal tetanus control.

Progress has been made in the integration of training modules of EPI with those of diarrhoeal diseases, acute respiratory infections, primary health care and maternal and child health. Studies on financing the EPI and its sustainability have highlighted many issues that will be useful for planning for the EPI of the 1990s.

Issues or constraints that will be critical for EPI progress into the 1990s in the South-East Asia Region are:

- limited government financing for immunization;
- inadequate budgeting of immunization activities;

Figure 12
Country TT2 Immunization coverage, pregnant mothers, SEAR 1988 - 1989

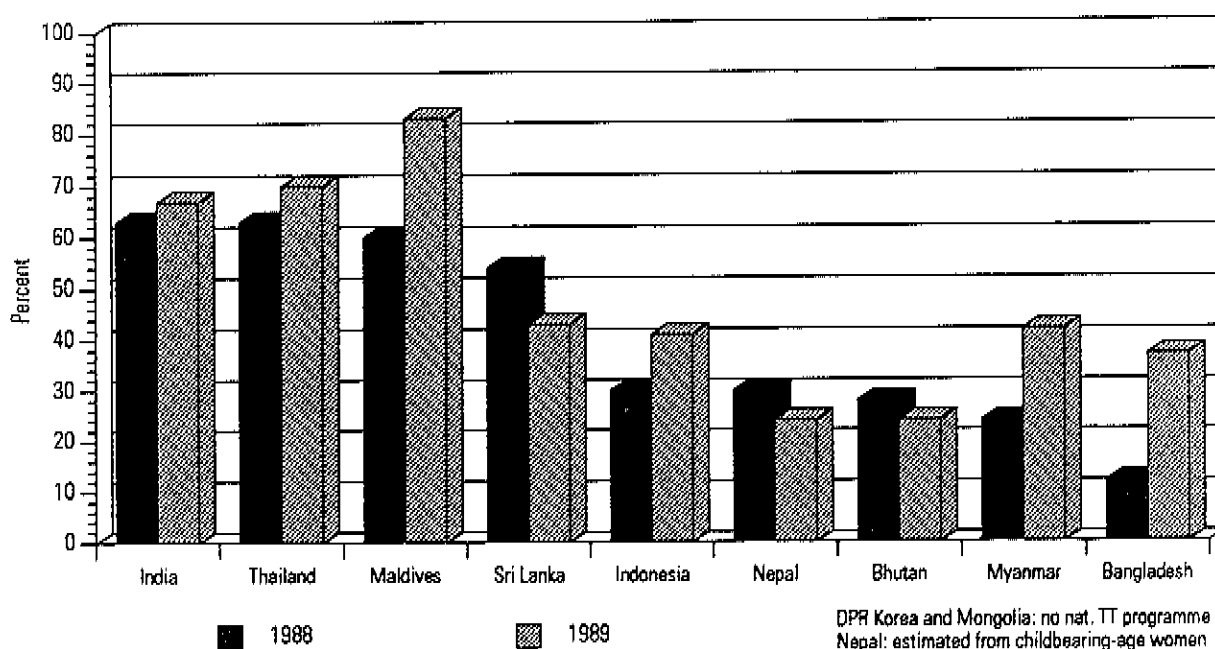
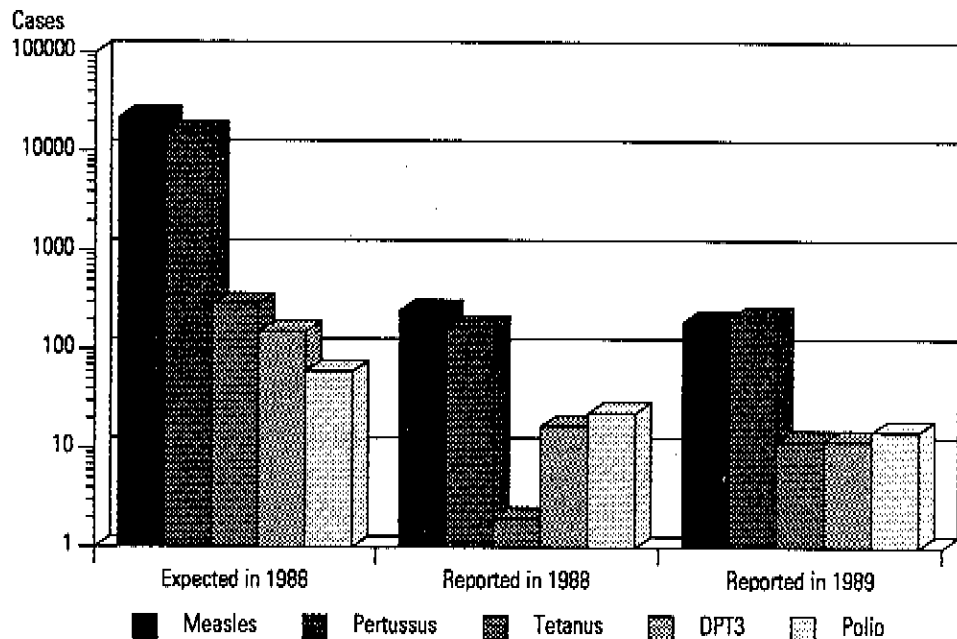


Figure 13
Estimated EPI Cases: Expected and reported, SEAR 1988 - 1989



Based on 1988 immunization coverage. Country reports; EPI,WHO,SEARO,Delhi, August 1990

- central versus local/decentralized funding;
- inefficiency of EPI field operations;
- immunization for the poor and underprivileged;
- relatively high rates of drop-outs and missed opportunities;
- national control of vaccine production, quality and potency;
- relatively expensive cold chain system;
- unsterile practices and procedures in the field;
- serious post-immunization reactions and complications;
- inadequate evaluation of the impact of EPI training;
- poor disease surveillance systems; and
- inadequate supplies of computers for the CEIS in Member States.

Western Pacific Region

The 35 countries and areas of the Western Pacific, in spite of their differences, have continued to make EPI a priority, and have worked to increase their immunization coverage. This political, financial and operational commitment to the programme has resulted in achievement of the regional goal of 80% coverage for each vaccine in children under one year before the end of 1990.

Regional immunization coverages at the end of 1989 were:

- BCG - 92%
- DPT3 - 87%
- OPV3 - 89% and
- Measles - 87%.

There are still great variations in coverage between the countries of the

Western Pacific Region. The more affluent countries have sustained high coverage and low incidence of vaccine-preventable diseases. Remarkable progress has been made in China through emphasis on cold chain development and vaccine delivery, and now childhood immunization coverage for all four vaccines is over 85%. Though somewhat slower, progress is now being made in the other developing countries in the Region as they strive to achieve 80% immunization coverage.

The incidence of EPI target diseases has continued to show decreasing trends. The incidence of diphtheria, tetanus, pertussis, poliomyelitis and measles has decreased. The prevalence of all forms of tuberculosis has also shown a modest decrease (Figures 14 and 15).

Training in programme management and cold chain maintenance and logistics was provided in 21 countries. EPI programme reviews were continued as a management tool, and several countries also conducted immunization coverage surveys.

Surveillance for the EPI target diseases is still weak. Efforts were initiated to review and strengthen national surveillance procedures and practices, particularly for poliomyelitis. Training courses were conducted in six polio-endemic countries. The training included case and outbreak investigation, and containment, and the analysis of outbreak investigation to direct future actions.

Among the developing countries of the Region, vaccine production is

Figure 14
Incidence of diphtheria, pertussis and tetanus, and immunization coverage with DPT3 in the Western Pacific Region, 1985-1988

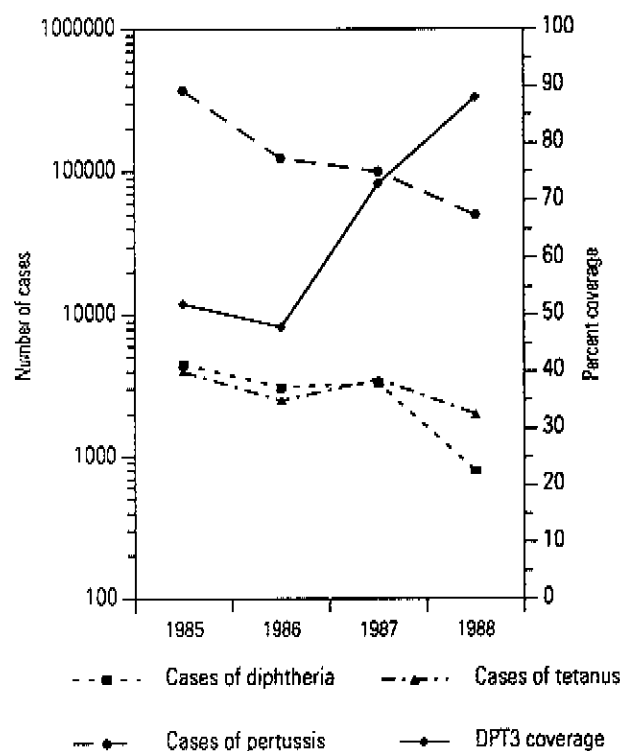
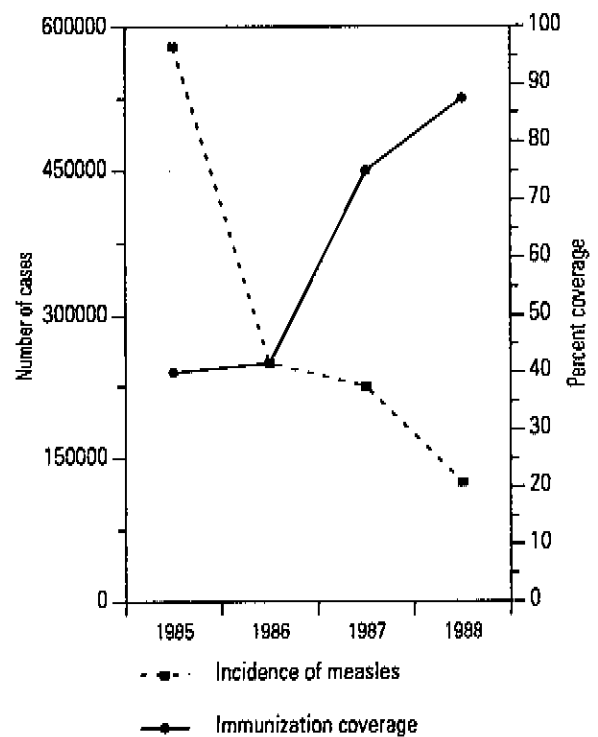


Figure 15
Incidence of measles and immunization coverage with measles vaccine in the Western Pacific Region, 1985-1988



continuing in China, the Philippines and Viet Nam, and work continues to improve the quality of these vaccines. Special efforts have been made to include hepatitis B immunization in the countries of the Region.

Prospects for the EPI in 1991 are encouraging in the Western Pacific Region. The health infrastructure

continues to expand and contribute to the sustainability of the achievements of 1990. The countries have been encouraged to continue to allocate additional resources to immunization in order to sustain the achievements of the 1980s into the 1990s. With the new initiatives for the 1990s, increased support from donors will be required.

4.

EPI COVERAGE AND DISEASE CONTROL

The EPI is a disease reduction programme, and attention was paid in the GAG meeting to the three specific disease control initiatives. While each disease initiative was dealt with separately, it was recognized that most of the issues overlapped each disease. Thus where one initiative was showing progress, the other initiatives were likely to benefit directly.

Poliomyelitis eradication initiative

By mid-October 1990, 22 416 cases of acute poliomyelitis had been officially reported from 107 countries for 1989.

The declining trend in the incidence of reported polio continued in all Regions except in the Western Pacific where the number of cases reported by China increased. Data reported by Member States to the African Region are too incomplete to allow conclusions on incidence trends to be drawn.

Low incidence or polio-free areas exist and are further developing in the Americas, Europe, Northern Africa, parts of Southern and Eastern Africa, the Arabian peninsula, Iran, Iraq, Syria, Jordan and the Pacific basin.

All regions have reached polio immunization coverage over 70% except for the African Region, which has increased coverage steadily to its present

47%. Caution is needed in interpreting average Regional and National coverage figures, which conceal areas of lower than average achievement.

Planning for global polio eradication has proceeded well, with plans of action prepared by all Regions and 115 countries. Four Regions have convened Technical Advisory Groups. In 1989/90, workshops to develop polio eradication activities were held in five Regions and in several countries with persisting poliovirus transmission.

The global plan of action for developing the laboratory network has been finalized and Regional plans of action will be developed by the end of 1990. A manual for the virological investigation of poliomyelitis has been prepared and is being distributed. Another manual, describing simple procedures to help reduce disability in polio victims, will shortly be ready for field testing.

Much research work has been conducted, producing important results to help the development of polio eradication policies, notably to support the modification of OPV formulation.

The Third Consultation on the Eradication of Poliomyelitis was held in Geneva from 3-6 September 1990 and arrived at four principal conclusions:

- polio will be eradicated by activities that target displacing the wild virus from a community, rather than only

- aiming at providing immunization for the individual;
- Supplementary immunization activities, in addition to routine services, are essential in most countries if poliovirus eradication is to be achieved;
 - The importance of surveillance as the basis for developing policies aimed at polio eradication remains undiminished;
 - The established EPI policy of defining high risk areas as priority areas for action is relevant for polio eradication. It is necessary to clearly define high risk areas and to develop policies on outbreak responses and "mopping-up" as integral parts of plans of action.

Six principal recommendations were formulated:

- The initial objective of polio eradication policies should be to aim for at least 80% immunization coverage, at which level, the incidence of polio may be expected to fall markedly;
- "Mopping-up" operations should be used in addition to routine immunization activities;
- "Mopping-up" should consist of the administration of a dose of trivalent OPV to all children aged 0-5 years living in a defined target area, preferably on a house to house basis, regardless of their immunization history, ideally with all other EPI vaccines and repeated 4-6 weeks later;
- All countries should aim for weekly reporting of polio cases, including zero reporting, as well as immediate reporting for action when cases are detected;
- During the next 12 months, surveillance indicators to monitor performance should be developed and feedback initiated through a newsletter;
- National plans of action should include details of activities to follow-up the detection of suspect cases, the minimum outbreak response having three elements: cases investigation, surveillance extended over a wide area, and immunization given to all children, ideally on a house to house basis.

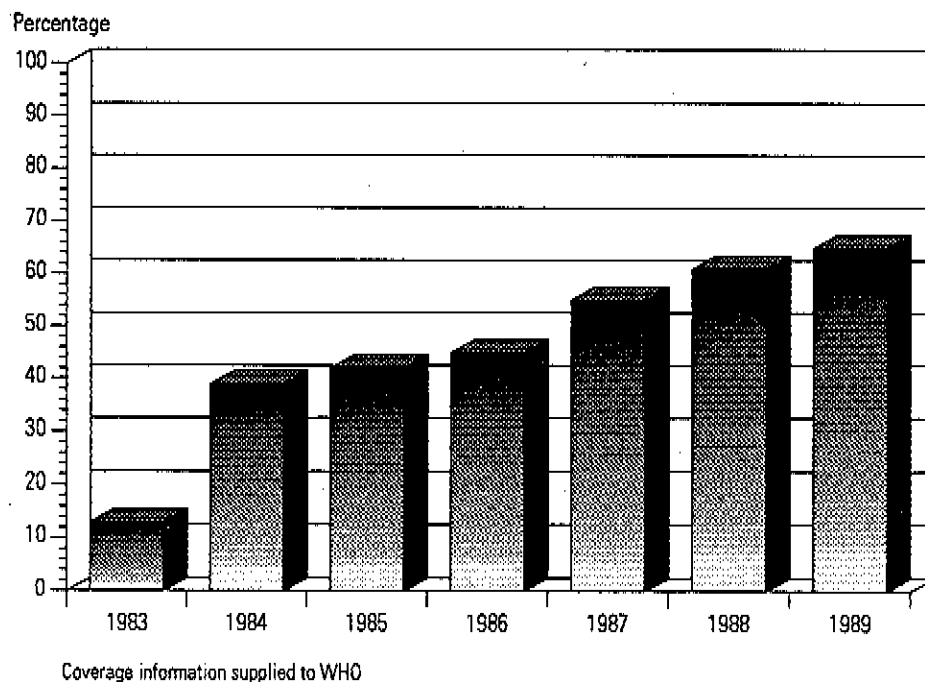
Measles control initiative

Measles control remains inadequate throughout much of the world. It is estimated that at least 1.4 million deaths are occurring every year due to measles. In reality, many more infants die from the delayed effects of measles in developing countries, clearly making this disease the greatest cause of death of all the vaccine-preventable diseases.

While an excellent measles vaccine has been available for more than twenty years, 32% of the world's children are not being immunized with it, most of them in developing countries. A priority for measles control in the 1990s is the increase in coverage for one dose of measles vaccine in every country and every district to 90% and beyond.

Another priority is to improve surveillance. Achieving both high coverage and good surveillance will not only help to reduce measles deaths but will strengthen the EPI and primary health care with reduced mortality and morbidity in other vaccine-preventable diseases.

Figure 16
Global coverage with measles vaccine 1983-1989



Even where programmes have reached high coverage levels for some time, experience shows that outbreaks must be expected (Figure 16). Outbreaks should not necessarily be regarded as a sign of programme failure. Programmes should be cautious about spending valuable resources on control measures in these situations, but must be prepared to react creatively, using the opportunity to raise public awareness to the advantages of immunization.

Mortality and morbidity can be reduced by aggressive treatment of cases. The major symptoms of measles complications (diarrhoea and chest infection) are amenable to treatment. In high risk areas, treating acute cases of measles with vitamin A supplementation can markedly reduce the death toll

and the number of children being blinded following measles.

Many countries will continue to need outside support for the coming decade to develop their measles control capabilities. While long term donor support will need to be provided, individual countries will also need to mobilize their own resources.

Neonatal tetanus elimination initiative

Achievements

Although many countries of the world will achieve the 80% coverage target towards the goal of Universal Child Immunization in 1990, some 770 000 newborn children will die from

neonatal tetanus who never had a chance to be immunized. The majority of deaths will occur in the South East Asian, Eastern Mediterranean and African Regions.

In 1990 the reported coverage of pregnant women in developing countries with at least 2 doses of tetanus toxoid is 27% including China and 42% excluding China. This is unacceptable when coverage with other EPI vaccines have achieved such a success.

Identification of countries and population groups at risk has benefited from the results of 42 special community based mortality surveys and from an active review of records in medical institutions in the American Region.

National plans for neonatal tetanus elimination are now available from 73 out of 90 countries at special risk.

It is now a policy to immunize women of child bearing age with tetanus toxoid in 65 of these 90 countries. This policy has, however, not been implemented in many of the countries.

Many countries in all regions have carried out studies on missed opportunities but only 17 out of 30 have looked at missed opportunities to immunize women. Only 5 countries, Djibouti, El Salvador, Pakistan, Sudan and Venezuela have carried out follow-up surveys to assess the impact of corrective measures.

There is little information on the availability, distribution and retention of a life long immunization record, but this is now a policy in 37 countries of the African Region. Progress has been made in the development of a credit card like immunization record. However,

procedures to introduce the card and methods to guarantee its retention have not yet been established. Funding sources for the card at country level are also not established.

Agreement has been reached on the content of a single-use clean delivery/cord care kit, the cost of which, including transport, is approximately US\$ 0.50. Its simplicity would allow most interested countries to produce it locally.

70% of countries now report neonatal tetanus separately but only 3% of the cases estimated to occur are being reported.

The current rate of progress will not permit the elimination of neonatal tetanus by 1995.

Major issues:

Some of the major constraints to higher tetanus toxoid coverage and higher number of clean deliveries are as follows:

- some countries with populations at high risk for neonatal tetanus have not yet planned elimination activities;
- except in the American Region, populations at risk in countries have rarely been identified;
- national policies to immunize women of child bearing age in countries have not been implemented;
- women are still not being immunized when they bring their children for immunization because:
 - supporting agencies and national managers have not made it a priority;
 - countries can achieve the 1990 Universal Child Immunization

- coverage even target with a low tetanus toxoid coverage;
- field staff have not been informed of new national policies or strategies to reach women of child bearing age;
- when informed of the new policies, field staff do not understand the benefits of immunizing women at children's immunization sessions;
- field staff fear they will run out of tetanus toxoid vaccine;
- immunization cards for women are often not available;
- supervision is still inadequate during implementation of new policies, and
- funds may not be available to provide cards and tetanus toxoid for all women of child bearing age.
- Tetanus toxoid is still not offered at every antenatal clinic in high risk areas;
- there are no widely accepted standard definition of clean delivery and cord care. Consequently, quality and progress in improving clean delivery cannot be objectively measured.

Current indicators for calculating tetanus toxoid coverage using service statistics give serious underestimates of the protection of newborns against neonatal tetanus. This is caused by overlooking women who, due to previous immunizations, are protected against neonatal tetanus, but who were not actually immunized during the current year.

"Administrative methods" for routine calculation of coverage are preferred.

Surveys are important where routine coverage data are absent, incomplete or of dubious quality, but they cannot normally be conducted in each administrative area with the required frequency to serve as routine management tools.

Monitoring neonatal tetanus elimination

Introducing the indicators listed below would significantly improve the monitoring of neonatal tetanus elimination and should be considered:

- *Neonatal tetanus incidence*
Data reported by countries to WHO Regional Offices using the best available data (e.g., from routine reporting or surveys) with source and year of data indicated.
- *Maternal death incidence*
Maternal mortality rate could be used as a proxy to measure clean delivery. The number and percent of countries which report maternal death should be monitored as well.
- *Completeness of reporting*
The number and percent of countries which report neonatal tetanus cases separately, including zero cases, should be monitored by WHO Regional Offices. Countries which still include cases of neonatal tetanus in the reported total number of tetanus cases are urged to introduce separate neonatal tetanus reporting by the end of 1991.
- *Immunization of women with tetanus toxoid*
The current indicator will continue to be used for routine monitoring of tetanus toxoid coverage at all levels.
 - Starting in 1993, tetanus toxoid coverage should be estimated at all

levels using the percent of children protected against neonatal tetanus at the time of birth.

- *Antenatal care coverage*

- Proportion of pregnant women who attended at least one antenatal visit during any one year;
- Proportion of pregnant women who attended at least two antenatal visits during any one year.

In addition, the following indicator could be used at the appropriate levels:

- Single-use clean delivery or cord care kit use. The definition of what constitutes a cord care kit may be designated by each reporting country.

There is no assurance that tetanus toxoid administered to women in the field is of proper quality due to:

- insufficient quality control at some vaccine manufactures, and
- potential freezing of the vaccine along the cold chain.

The single most important activity that will improve tetanus toxoid immunization is amazingly simple and only needs limited additional resources. If women are immunized with tetanus toxoid when they bring their infants for immunization, the coverage rate for this vaccine will immediately rise to equal that for DPT1. Coverage will increase from 32% to over 80% and another 300 000 neonatal deaths will be prevented.

This strategy should have the highest priority for the next two years. Having achieved this, some additional activities, only in high risk areas, will be needed to achieve neonatal tetanus elimination by 1995.

5.

BCG POLICY

Studies initiated by WHO in young children showed that the vaccine gave, on the average, a substantial, but varying, efficacy against the more severe forms of childhood tuberculosis.

In a comparative study, protection was shown to vary with the vaccine seed lot used. Also the frequency of adverse reactions varied. The quality of handling and administering BCG is likely to influence efficacy and in several studies, the level of induced tuberculin sensitivity was very low.

The most troublesome adverse reaction to BCG is suppurative lymphadenitis. Recently several "outbreaks" have been reported. The risk

depends on the seed lot used in the production of the vaccine and on the dose administered. A new vaccine, therefore, should be assessed before mass application and the dose adjusted by the manufacturer if necessary.

Recommendations regarding the administration of BCG in countries where HIV infection occurs among neonates remain unchanged.

Disseminated BCG-itis has been observed in only a few HIV-infected infants; it responded well to chemotherapy. The risk of suppurative lymphadenitis may be slightly increased, but not to an extent that it could jeopardize the immunization programme.

6.

SURVEILLANCE OF PREVENTABLE INFECTIOUS DISEASE INCLUDING EPI TARGET DISEASES

The objective of the EPI is to reduce morbidity and mortality caused by certain vaccine preventable diseases, the number of which will expand in the future. For poliomyelitis, neonatal tetanus and measles, global targets have been set. These targets can only be reached if the disease surveillance is effective.

In disease reduction programmes, surveillance is a management necessity to identify needs for programme improvements; a tool for motivation of staff and a political imperative to sustain a high priority within the health sector and continued external support.

To stimulate improvements of surveillance of infectious diseases at national level, surveillance of the EPI targets diseases should be developed through a strengthening of the routine surveillance system for infectious diseases. The purpose of making infectious diseases notifiable should be considered carefully. Suggested criteria for making a disease reportable are:

- that even one or a few cases will trigger special investigations eventually followed by containment measures (e.g. cholera, meningococcal disease, diphtheria, polio);
- that the disease is subject to a specific reduction programme in which reduction, elimination or eradication

targets have been set (e.g. measles, neonatal tetanus, polio);

- that epidemiological data on trends are needed for purposes of planning or programme development (e.g. diarrhoeal diseases, hepatitis B).

Disease surveillance should be oriented towards actions and performed at all levels (local health units, district, regional and national levels). At all levels, individual staff members should be given responsibility for compiling data, analysis, initiating actions and forwarding the surveillance data to the next level.

The routine surveillance system should be considered the core of disease surveillance. Monthly (or weekly, if so preferred) summary reports should be sent on time from all health units and a system be installed to follow up on reporting defaulters. Rare notifiable diseases should be reported individually and immediately. Such cases should also be included in the monthly reports, which should be sent whether or not there are cases to report (zero reporting). For diseases included in reduction programmes and becoming rare, investigation of outbreaks become increasingly important to identify programme failures and create a basis for control measures.

Improving national surveillance systems for infectious diseases will, in many countries, imply a strong collaboration between different sections of the Ministry of Health and training of staff members at the same courses in the concepts and implementation of disease surveillance.

Specific surveillance needs for poliomyelitis

Surveillance to detect poliomyelitis should concentrate on identifying cases of acute flaccid paralysis, with special emphasis on children less than 15 years of age.

An official at the Central or sub-national level should be designated to be responsible for ensuring that all suspect cases are reported, competently investigated clinically and epidemiologically and in the laboratory following the collection of faecal specimens for virus isolation.

At defined levels, a specialist team, including neurologists, epidemiologists, paediatricians, laboratory and EPI staff should be available initially to classify cases as probable polio or discarded cases and later, to produce a final classification of the case and any virus isolated.

Indicators should be developed to allow monitoring of surveillance performance. These should include percentage achievements in identifying, reporting and investigating suspect cases within two weeks of onset, the collection of specimens and the institution of outbreak control measures.

Baseline studies of flaccid paralysis, in the absence of wild poliovirus transmission, have suggested an inci-

dence of 1-2 cases per 100 000 population under 15 years of age. If surveillance is effective, cases of the Guillain Barre syndrome, transverse and traumatic myelitis and, where live attenuated vaccine is used, vaccine association polio, *should* be reported. The incidence reported is a further indicator of the national or sub-national capacity to identify acute polio, should cases occur.

Developing the technical competence to investigate suspect polio and to develop effective surveillance requires well trained epidemiological staff, health professionals motivated to report suspect cases, the logistic support capacity for investigators to travel to infected areas, to collect and transport specimens and competent laboratories using reliable standardized techniques.

Specific surveillance needs for neonatal tetanus

The objectives of surveillance of neonatal tetanus is to assure that, should it occur, it has a high probability of being identified and reported.

If community based mortality surveys have helped to document the magnitude of the problem they should not be repeated routinely. They are too expensive and they become more costly as neonatal tetanus incidence is reduced.

The poor performance of current routine reporting of neonatal tetanus reflects partly the fact that many cases occur in areas without health facilities. However, many cases seen in health facilities are not reported due to insufficient skills and motivation of the staff responsible for diagnosing and reporting cases.

In risk areas, records in health services reporting neonatal deaths should be reviewed and "vital event registers" established. This process should involve local health workers and hospital staff in the review process will improve their

knowledge of neonatal tetanus record keeping. The use of data on neonatal tetanus at local level will, in turn, improve the sensitivity and the specificity of routine surveillance of neonatal tetanus.

7.

ADVERSE REACTIONS

Adverse medical events occasionally follow immunization with vaccines used in the EPI. These include events:

- due to poor handling or administration technique;
- which occur coincidentally after immunization, but are due to other causes; or
- which occur rarely, but are associated with the intrinsic characteristics of the vaccines.

The detection of serious adverse events following immunization is important to the success of a programme since such events can influence a community's acceptance of immunization. In developing countries, the majority of complications recognized following immunization appear to be programme related; thus the underlying causes need to be identified and corrected.

All EPI areas should monitor selected adverse events following immunization, with the degree of monitoring depending on the priorities dictated by the programme. In most areas the priority will be to examine events that cause community concern to detect programmatic errors that can be prevented. These events include abscesses following DPT immunization and reported deaths temporally associated with immunization. More advanced

programmes will follow-up on events including inherent risks of vaccines, such as BCG-lymphadenitis, while the most advanced programmes may be at a stage to assess the incidence of rare events, such as encephalitis associated with some viral vaccines.

Although most programmes will use a passive system to detect adverse events, attention must be paid to linking the person administering the vaccine and the person who the patient sees for treatment following the adverse event. Some consideration should be given to stimulate reporting, especially for rare events of particular interest. Monitoring of adverse events following immunization is time consuming and expensive, but the costs of not doing so, in terms of lives saved, is greater.

WHO can assist this effort:

- by convening consensus groups to develop standardized case definitions for adverse reactions;
- by providing training materials and field guides;
- by deriving guidelines for adverse reaction monitoring especially in clinical trials; and
- by commissioning position papers that quantify the risks and benefits of immunization including risk assessment for serious adverse events thought to be vaccine-related.

Guidelines to national programmes should include information to health workers on how to treat patients experiencing such events and on those

few existing contradictions to immunization as well as information on programme development.

8.

NEW VACCINES

Yellow fever vaccine

Yellow fever has circulated in endemic forest areas in the Americas, usually infecting up to 500 un-immunized forest workers per year. In contrast, yellow fever in Africa periodically explodes out of its endemic cycle to infect large numbers of individuals during major epidemics.

The live, attenuated 17D yellow fever vaccine has been proved safe and effective. It provides long-term (probably life long) immunity. Only 17 cases of vaccine-associated encephalitis have been recorded in over 40 million doses of vaccine distributed. Since 15 of these 17 cases occurred in children 4 months of age or younger, it is recommended that the vaccine not be given to children under 6 months of age.

Factors that previously limited the supply of this vaccine are now being overcome. Vaccine production facilities have improved, the thermal stability of the vaccine has been increased, and it appears that it can be administered simultaneously with a variety of other vaccines, including measles, hepatitis B vaccine, DTP, polio (both IPV and OPV), and BCG. It should, however be noted that only limited studies exist concerning simultaneous use of DPT and yellow fever vaccines.

The mass immunization between 1940-1960 in francophone West Africa virtually eliminated yellow fever from these countries. However, this policy was abandoned in 1960 and since then a series of epidemics of greater and greater severity have occurred.

The disease threat is substantial. The 3-year period 1986-1988 was an extraordinarily active period of yellow fever. The worldwide total of 5 396 cases and 3 172 deaths (case fatality rate 59%) represents the greatest number of yellow fever cases reported to WHO for any 3-year period since reporting began in 1948. Of this 3-year total, the number of reported cases in Africa was 4 772, with 2 470 deaths (case fatality rate 52%).

Previous GAG Meetings have recommended that endemic countries consider incorporating yellow fever vaccine into their immunization programmes. It appears that the following countries have at least partially incorporated yellow fever vaccine into the infant immunization schedule in recent years: Angola, Burkina Faso, Central African Republic, Chad, Côte d'Ivoire, Gambia, Ghana, Mauritania, Niger, Nigeria, and Senegal. Most give the vaccine with measles vaccine at 9 months of age and, based on a review of coverage survey data, yellow fever

vaccine coverage in a number of these countries has reached the same coverage as measles vaccine.

Considering the increasing disease threat, the availability of a safe vaccine and the availability of immunization services, there is an excellent opportunity to control yellow fever in Africa. A global commitment should be established towards achieving this goal.

Hepatitis B vaccine

Hepatitis B is now preventable with a safe and effective vaccine - the first vaccine against cancer. It is estimated that more than two thousand million individuals have been infected with the hepatitis B virus (HBV) globally, of whom some 300 million are chronically infected carriers at high risk of serious illness and death from cirrhosis of the liver and primary liver cancer. A total of 22 countries, primarily in the Western Pacific and Eastern Mediterranean Regions have a policy of immunizing all newborns with hepatitis B vaccine or plan to do so this year. Twenty-three additional countries have pilot infant immunization projects in selected regions of the country planned or underway. Twenty-seven other countries have selective immunization programmes in place or planned.

Studies of the cost effectiveness of integrating hepatitis B immunization into the EPI in developing countries predict a cost per carrier prevented ranging from \$65 to \$100, and a cost per death prevented ranging from \$260 to \$400 at a vaccine cost of \$1.00 to \$1.40 per dose. In one analysis, the cost per death prevented drops to \$75 if

vaccine costs drop to \$.50 per dose, a level probably achievable when UNICEF is able to introduce large scale competitive bidding.

The single most important step in the global control of hepatitis B will be the integration of this vaccine into the EPI. This integration was recommended by the Technical Advisory Group on Viral Hepatitis and the Global Advisory Group of EPI in 1987, and strongly reiterated in 1989. Epidemiological data from a number of developed countries indicate that, even in areas of low endemicity, strategies targeting hepatitis B vaccine at high risk groups will not effectively control hepatitis B virus infection in these populations.

Hepatitis B vaccines are stable, safe, immunogenic, and effective. There are no technical or scientific impediments to their immediate use. Indeed, the dimensions of the global problem of hepatitis B virus infection make it clear that their use is a matter of urgency. As with all vaccines, research and development efforts must continue to improve the vaccine and its preparations, to determine the most cost effective strategies for delivering it, and to lower the costs of production. The paramount task is to develop national programmes and obtain financial resources to provide this vaccine to the world's children.

Hepatitis B vaccine in the Eastern Mediterranean Region

There is evidence that hepatitis B is highly endemic in the Eastern Mediterranean Region. The Regional Committee adopted a resolution calling on all Member States to develop and

strengthen national plans for hepatitis B control through introduction of hepatitis B immunization of infants where and when possible.

The Regional office is supporting four demonstration projects on the feasibility of integrating hepatitis B vaccine into the EPI schedule and identifying problems and constraints. The demonstration projects are still in

their early stages. Preliminary activities including site selection, recruitment of health workers and production of training materials have been completed.

In addition, the Region is helping countries to develop a potential for hepatitis B vaccine production in the Region and in producing the reagents necessary for detecting markers of viral hepatitis infection.

9.

SUSTAINABILITY

Four papers were presented. The first provided an overview of some of the issues of sustainability.

The second paper outlined some of the factors which affect the financial sustainability of the EPI. The major premises being that:

1. the donors and technical agencies have a tremendous influence over the cost of the EPI and
2. a strategy that takes financial considerations into account must be included in the broader EPI strategies to help ensure that a strong and effective EPI can be sustained at the local, national and Global levels.

The third paper addressed the need to improve the quality of EPI services to enhance the service delivery. It examined the role of the supervisory system in assuring the quality of care provided by the EPI, and it outlined recent efforts to measure that quality.

The final paper addressed the issue of increased awareness of, and the demand for, immunization services through communications strategies.

Each paper concluded with a series of recommendations to help managers strengthen their programmes in the areas covered.

10.

PROMOTING OTHER PRIMARY HEALTH CARE PRACTICES

Micronutrient supplementation

Micronutrient deficiencies present an unique opportunity for simple, proven and low-cost nutritional interventions to impact on large populations. Since 1986, the Expanded Programme on Immunization has supported initiatives to integrate vitamin A and iodine supplements delivery within national immunization programmes where appropriate.

Large dose vitamin A supplements (200 000 IU) are known to protect against potentially blinding lesions for at least six months, and to be associated with reduced mortality in vitamin A deficient preschool-age children. There is no clear evidence on the duration of protection of these large dose vitamin A supplements against either death or other illnesses such as diarrhoea and acute respiratory infections. Weekly low dose vitamin A supplementation (8 300 IU) of vitamin A deficient children in India has been shown to considerably reduce mortality. The reduction of mortality in the Indian study using low dose vitamin A supplements was most marked in infants aged 6-11 months. There is, however, little data on the impact of vitamin A supplements before six months of life.

Large doses of vitamin A should not be used in pregnancy in view of the teratogenic risk to the fetus.

Oral iodized oil at standard doses (240 mg or 480 mg) is effective in preventing iodine deficiency for 1-2 years, depending on the degree of environmental iodine shortage. Oral iodized oil is safe in pregnancy.

Immunization programmes in most developing countries are aimed at children in the first year of life and women of child bearing age. Mortality and blindness from vitamin A deficiency, on the other hand, are highest in late infancy and through the early preschool years. The rationale of vitamin A supplementation through the EPI is to ensure that children enter the period of greatest risk with a body reserve as high as possible.

The target group for iodine supplementation is larger, including women of child bearing age as well as children up to the age of 15 years. The contribution of supplementation through the EPI would reduce specially the incidence and severity of neurological lesions and cretinism.

Vitamin A for Measles. Despite increasing coverage with measles immunization, large numbers of cases of

measles continue to occur. The use of vitamin A for cases of measles in high risk areas is confirmed as an important way of reducing both mortality and morbidity after measles. In a randomized controlled trial published in 1990, a

large dose of vitamin A given to children with measles under the age of 24 months reduced the death rate by more than half and the duration of pneumonia, diarrhoea and hospitalization by about one-third.

11.

IMPROVING THE QUALITY OF LOGISTIC SYSTEMS

Although the vaccine cold chain is now well established in most countries, deficiencies remain in many areas. In these areas, vaccines remain at risk. Identifying these risk areas, studying the problems and planning improvements are essential tasks if the quality of the logistic system is to be assured everywhere.

Following a meeting of 40 logistics specialists who attended a WHO and UNICEF TECHNET consultation in Cyprus in March 1990 it was concluded that improvements were still needed in the equipment used in the EPI. However, the development of logistics management skills, including those needed to plan improvements to national systems, should be a primary objective of the 1990s.

Development of logistics management skills

National surveys have been used as a method to define risk areas in many countries recently and, in particular, in the European region. These surveys have proved effective but have been lengthy and costly to organise and often depend on outside help to initiate and conduct them. An alternative approach has been proposed, drawing on the methods used in the disease control

initiatives. General indicators of weakness in programme management or infrastructure and other reported data on logistics systems may be used to identify areas for more detailed study.

Areas at risk, or areas where there has been an outbreak of disease in immunized children, become the focus for study in the following areas:

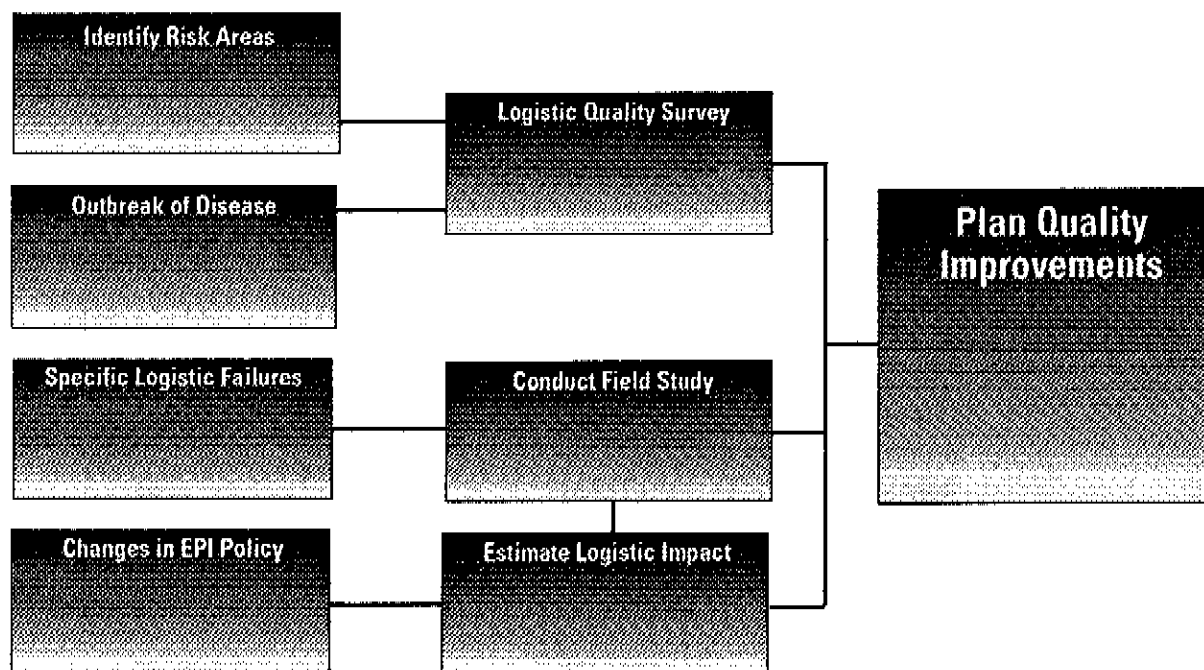
- safety of injections
- handling of vaccines
- management of transport
- distribution of supplies

Protocols for such studies, which have been used in national and sub-national surveys, already exist. The best parameters of each of these surveys are being incorporated into a standard logistic survey procedure which will then be disseminated as a tool for logistics managers.

The study of risk areas is not the only activity leading to improvements (Figure 18). Major programme policy changes, such as a change of strategy or the introduction of a new vaccine, often have a heavy impact on logistic systems throughout the country.

The impact, in terms of equipment, supplies, fuel and transport, of such changes can be estimated by the logistics manager only if inventory and reporting systems are in place to provide the

Figure 17
Planning Quality Improvements



required information. Thus, the reinforcement of reporting systems and the development of computer software to manage inventory systems and impact assessment are also important objectives for the 1990s.

Finally, specific failures in equipment, supplies or procedures also indicate the need for improvement. The precise cause of such failures is not always clear without a field investigation and retrospective study of records. Sometimes, a short study is required to monitor the conditions thought to provoke a failure. Yet, today, failures are generally inadequately reported so that corrective action is either mis-directed or sometimes not taken at all.

Senior managers of the EPI must not only be knowledgeable in the technical

areas of logistics but must also be trained in the process of evaluating and planning improvements to the logistic systems. The priority development activities planned in the area of logistics can be summarised as follows:

- prepare senior level training in the planning and management of logistics;
- develop software tools for inventory systems and impact assessment;
- standardise logistic survey protocols and develop analysis and reporting software;
- support field studies to examine the extent and cause of failures of equipment, supplies or logistic procedures.

Development and implementation of new technology

Progress was summarized in four areas:

Refrigeration technologies: solar, photovoltaic refrigeration systems continue to be installed in increasing numbers. There are over 1 700 systems worldwide with the majority in the African region and an increasing number of countries in other regions are planning or installing large numbers of systems. Performance and running costs are being monitored in four countries and are planned for eight others with reports expected from late 1990.

Other activities include the development of upgrade kits for domestic compression refrigerators and preparations for the reduction in the use of chlorofluorocarbons in refrigerator and cold box production following international agreements now coming into force.

Technologies in support of Disease Control Initiatives: Specimen collection kits have been manufactured in trial quantities for the reverse cold chain of the polio eradication initiative and will be evaluated in the field during 1991. Specifications are being developed for the manufacture of lifetime immunization cards in the format of a standard credit card, and for the manufacture of single-use cord care kits in trial quantities.

Use of chemical indicators in the EPI: Improvements in chemical indicators together with a significant lowering of costs now allow for a more complete integration of these tools into the EPI. TST Indicators which monitor the adequacy of steam sterilization, can now be used routinely. STOP!Watch indicators should monitor every item of static cold chain equipment and individual vaccine vial indicators, when available, will assure the health worker that the vaccine has not been destroyed by heat at the time of administration. Vaccine Cold Chain Monitors will continue to play an important role in surveys and international shipments.

Implementation of the auto-destruct syringe: Tenders have been invited for the supply of the first eighty million auto-destruct syringes to UNICEF. When auto-destruct syringes have entirely replaced standard disposable syringes, the EPI will be able to claim that injections for immunization are the safest available and should be used as a model for other injections. In the meantime, to guard against needle-stick injuries, all disposable syringes should be supplied with "sharps boxes" suitable for final disposal. Recapping of needles should be discouraged. Pending on the outcome of field studies, pre-filled injection devices may be used in conjunction with tetanus and hepatitis B vaccine outside the cold chain. Low cost jet injectors will soon be ready for testing and may ultimately become the cheapest and safest injection method.

12.

PROPOSALS FOR 1991

The 1991 meeting will be hosted by the European Region, and it was suggested to hold the meeting in Turkey. Tentative dates are 14-18 October, to be preceded by a meeting of the Research and Development Group on 10 and 11 October. A meeting of the Regional EPI Advisers will be held on 12 October to review and discuss issues that will be brought before the Global Advisory Group.

At present, the major concerns for 1991 fall into the following main areas:

- achieving and sustaining high immunization coverage;
- controlling the target diseases;
- improving surveillance;
- vitamin A and iodine supplementation through EPI;
- programme sustainability.

ANNEX

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List of Documents

EPI/GAG/90/1	Agenda
EPI/GAG/90/2	List of Participants
EPI/GAG/90/3	List of Documents

Working Papers

EPI/GAG/90/WP.1	EPI Global Overview
EPI/GAG/90/WP.2	EPI Overview in Eastern Mediterranean Region
WP.2.1	Egypt Country Report: The decade for children
WP.2.2	Iran Country Report: Maintenance of the Plan of Action for the elimination of neonatal tetanus
WP.2.3	Oman Country Report: Polio surveillance and outbreak containment
WP.2.4	Regional Report: Integration of Hepatitis B vaccine into the routine EPI
EPI/GAG/90/WP.3	EPI Overview in the African Region
EPI/GAG/90/WP.4	EPI Overview in the Region of the Americas
EPI/GAG/90/WP.5	EPI Overview in the European Region
EPI/GAG/90/WP.6	EPI Overview in the South-East Asia Region
EPI/GAG/90/WP.7	EPI Overview in the Western Pacific Region
EPI/GAG/90/WP.8	BCG Vaccine and Immunization Policy
EPI/GAG/90/WP.9	Achieving and Sustaining Universal Child Immunization
EPI/GAG/90/WP.10	Acceleration of the EPI towards 1995 to Reach the Measles Control Goal
EPI/GAG/90/WP.11	EPI Target Disease Surveillance
EPI/GAG/90/WP.12	Monitoring of Adverse Reactions
EPI/GAG/90/WP.13	Yellow Fever Vaccine
EPI/GAG/90/WP.14	Integration of Hepatitis B Vaccine into the EPI
EPI/GAG/90/WP.15	EPI Sustainability
EPI/GAG/90/WP.16	Potential PHC Practices Suitable for Promotion: the example of micronutrient supplementation

Other Documents

EPI/NNT/90.1	Neonatal Tetanus Initiative: Progress Report and Recommendations
EPI/POLIO/89.4.Rev.2	Overview: Poliomyelitis Eradication Initiative
EPI/POLIO/90.3	Report of the Consultation on the Eradication of Poliomyelitis Draft, Revision 1
EPI/CEIS/90.3	Report of the 2nd Meeting on Global Strategies for Computerized EPI Information Systems
WHO/EPI/LHIS/90.2	Report of the 1990 Technet Consultation
WHO/EPI/GEN/90.7	Measles Control in the 1990s: Introduction of High Titre Measles Vaccine
WHO/EPI/LHIS/90.5	EPI Logistics and Cold Chain: Improving Quality 1990

Terms of Reference of the EPI Global Advisory Group

1. An appropriately constituted Advisory Group of outstanding consultants will be appointed to advise the 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 Group:

Members of the Advisory Group will be appointed by the Director-General. It will consist of approximately 12 members, at least one from each Region being selected from a panel nominated by the Regional Offices. The others, selected "at large", will provide geographical and technical balance. Appointment will generally be for a period of one year with extensions arranged so as to provide for a turnover of approximately one third of the group each year. Re-appointment will not normally be considered before one year has lapsed from the previous termination date.
4. Meetings of the Advisory Group will be convened as required, but usually on an annual basis, and a report of each meeting will be prepared and circulated appropriately.

Estimated annual number of deaths prevented from neonatal tetanus; cases and deaths prevented from pertussis and measles; and cases prevented from polio in 26 developing countries; based on data available as of July 1990

	(a) Newborns 000's	(b) Surviving infants 000's	(c) Prevented neonatal tetanus deaths 000's	(d) Prevented pertussis cases 000's	(e) Prevented pertussis deaths 000's	(f) Prevented measles cases 000's	(g) Prevented measles deaths 000's	(h) Prevented polio cases 000's
26 largest developing countries	102019	94225	381	48669	409	60908	1249	343
Other developing countries	28113	25211	64	9536	107	13412	402	66
Total developing countries	130132	119436	445	58205	515	74320	1651	409

a) Newborns: based on 1989 estimated population and crude birth rates.

b) Surviving infants: based on estimated number of newborns and infant mortality rate.

c) Based on mortality estimates from surveys or reports, a vaccine efficacy of 0.95 and immunization coverage reported as of July 1990. Countries without available data were arbitrarily categorized into one of 3 levels of neonatal tetanus mortality: 5, 10 or 15 per thousand live births.

d) 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 July 1990.

e) Based on mortality estimations of one-third of measles deaths, a vaccine efficacy of 0.8 for 3 doses, and immunization coverage reported as of July 1990.

f) Based on an incidence estimation of 100% surviving infants in absence of an immunization programme, a vaccine efficacy of 0.95 and immunization coverage reported as of July 1990.

g) Based on arbitrary case fatality rates ranging from 2% to 4%, a vaccine efficacy of 0.95 and immunization coverage reported as of July 1990.

h) 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 July 1990.

Estimated annual number of deaths from neonatal tetanus, measles and pertussis and annual number of cases of poliomyelitis in developing countries, based on data available as of July 1990.

	Neonatal tetanus (a) 000's	Measles (b) 000's	Pertussis (c) 000's	Total deaths 000's	Cum.% of total deaths	Polio cases (d) 000's	Cum.% of cases
26 largest developing countries	550	1012	345	1907	73	128	68
Other developing countries	217	354	145	716	27	60	32
Total developing countries	767	1366	490	2624	100	189	100

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

- a) Neonatal tetanus: Based on survey data or in absence of survey, neonatal tetanus deaths are estimated from countries with similar socio-economic conditions.
- b) Measles: It is assumed that the vaccine efficacy is 95% and that all unimmunized children will acquire measles. Coverage is assumed to be zero in countries from which data are not available.

c) 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.

d) Polio: In view of narrow limits of variations of results of poliomyelitis surveys, and in the absence of an immunization programme, a fixed incidence rate of five cases per thousand newborns is used. A vaccine efficacy of 95% is used. Coverage is assumed to be zero in countries from which data are not available.