

Protection for Every Child from Preventable Diseases

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THIS year, as in many years past, millions of children in the developing world will die or be crippled by diseases that effective immunization services have virtually banished from the developed countries. To end this gross inequality, WHO and its Member nations have committed themselves to providing immunization services for every child in the world by 1990. These services have been recognized as a basic component of primary health care, a revolutionary new strategy to achieve WHO's proclaimed goal of "health for all by the year 2000".

Six diseases of childhood are now included in what is known as the Expanded Programme on Immunization (EPI): diphtheria, pertussis (whooping-cough), tetanus, measles, poliomyelitis and tuberculosis. While these six diseases are under attack, basic systems are being developed that will permit countries to deliver any vaccine of merit. These delivery systems will play an increasingly important role in preventing death and disability as advances in research make new vaccines available.

Five million deaths

The six diseases provide a good starting point. They kill some five million children each year, and for each dead child, another lives who is crippled, blind, mentally retarded or otherwise disabled for life. These numbers are so large that their significance is not easily grasped by those in developed countries. In the developing countries, the diseases are so commonplace that parents, and sad to say, health workers and political leaders are still for the most part numbed into accepting this continuing tragedy. Thus less than 10% of the 80 million children born each year in developing countries are now receiving immunization services, despite their low cost and ease of delivery.

Of the six diseases, the leading killers are *measles*, *pertussis*, and *tetanus* of the newborn. The first two diseases have case fatality rates ranging between 1% and 10%, the higher rates more commonly observed among younger and/or less well-nourished children. Tetanus of the newborn probably affects less than 2% of children in developing countries born to unimmunized mothers, but 70% to 90% of those infected die.

The leadingcrippler is *poliomyelitis*. Virtually every unimmunized child is infected with one or more of the polioviruses. This infection results in paralysis in about 1% of children under the age of three years, and in a higher proportion of children infected at older ages. An ominous trend of increasing numbers of reported paralytic poliomyelitis cases has been observed in developing areas during the past few years. Perhaps this reflects improved reporting, but it may be an indication also of improved standards of living and sanitation, which, by delaying the average age of first exposure to polioviruses, may be contributing to higher paralytic attack rates. Deaths may occur in 15% of paralytic cases.

Although infection with the bacilli which cause *tuberculosis* is not infrequent in childhood, and can spread to many sites within the body or result in meningitis, a child's first infection is likely to cause no symptoms, and may emerge only years later as an active disease, producing disability and death. Tuberculosis remains a major public health problem, with some three-and-a-half million new cases and half a million deaths occurring each year. It can be prevented by BCG vaccination but because the disease remains dormant for a long period in many individuals, the impact of BCG

often takes many years, unlike most other vaccines whose results can be observed much more quickly.

The morbidity and mortality resulting from *diphtheria* is less well defined than for other diseases, although over 100,000 deaths are believed to be occurring annually among children of less than five years of age.

National commitment

What can be done to rectify the situation? Developing countries seeking to ensure immunization services for all children, irrespective of social strata, face a difficult challenge. The challenge, however, is to provide simple and inexpensive services for all, and does not require an investment in new or complex medical technology. It can be met through personal and national commitment to achieve the programme goal.

The basic commitment to provide immunization services for all of their children by the target date of 1990, should be reflected in funds allocated by the countries in their national budgets. A programme manager and supporting staff for each national programme should be identified. The next step is the development of detailed plans of operations describing exactly what the country intends to do to make the programme a success. These plans are necessary not only for the sound management of the programmes, but also for international agencies and donor countries who wish to ensure that the resources they might be willing to invest in expanding immunization programmes will be well utilized.

Because immunization services must continue to be delivered to successive generations of susceptible children, an immunization programme cannot be planned as an intensive short-term effort, or

delivered through mass campaigns that cannot be sustained over a several-year period. For this reason, emphasis in the planning stage is given to the integration of immunization services within the primary health care network of each country, using immunization to strengthen this level of care rather than promoting it as a competitive service. This is particularly true for maternal and child health care, which is incomplete without immunization.

WHO's catalytic role

WHO's role, at the global, regional and country levels, is that of a catalyst. It responds to the expressed needs and desires of Member States while promoting attitude changes conducive to the achievement of the programme goals. WHO activities in support of national programmes are concentrated in four areas.

Programme operations: Technical cooperation in the implementation of national programmes is provided through fellowships, short- and long-term consultant and written materials. Stress is placed on improving epidemiological information systems, development and implementation of appropriate operational strategies, integration of immunization activities into ongoing or planned primary health care activities, especially MCH, and on developing evaluation systems to monitor progress and suggest shifts in strategy or changes in emphasis.

Basic and applied research: WHO is taking an active part in promoting both basic and applied research relevant to the objectives of EPI. Continued studies on the nature and mode of spread of the target diseases are needed to refine information concerning age of attack, extent of complications, patterns of transmission, and barriers to protection with various vaccines. Applied research will focus on ways of improving operational strategies and on improving the quality and appropriateness of supplies and equipment.

One of the main hurdles immunization programmes face in tropical climates is the problem of keeping the vaccines from be-

coming impotent during storage or transportation. An important research undertaking during the coming five years, therefore, is the testing and development of suitable cold chain equipment, such as refrigerators, cold boxes, vaccine carriers and cold packs that could be manufactured in the countries or regions where they are to be used. Studies on syringes and jet injectors are being pursued to identify the most efficient, inexpensive and hygienic means of giving injections to large groups of people.

With UNDP support and technical supervision by WHO's biologicals unit, work is being carried out to develop more stable, more potent and less reactogenic vaccines, concentrating particularly on pertussis, polio and measles.

Training: EPI training activities are at present laying emphasis on the preparation of national programme managers. The training is based on a self-instructional curriculum and methodology specifically designed for EPI. In coming years, emphases will shift to the training of middle level supervisory personnel. The curricula being developed for them will cover the major operational activities of EPI, but will have the flexibility to permit the training and re-training of field staff according to national programme needs. In all courses, students will be equipped to become the teachers of future courses which they themselves can give. To strengthen national and regional vaccine quality control and production capacities, training programmes for selected laboratory supervisors are being initiated. In addition, manuals have been distributed describing WHO-recommended techniques for the production and quality control of the components of DPT vaccine (a combined vaccine against diphtheria, pertussis and tetanus), and which provide information on the construction of vaccine production and quality control facilities.

Exchange of information: Through training courses, meetings and distribution of written materials, WHO provides opportunities for the exchange of experience, ideas and methodologies among countries involved in the

programme. Published materials relevant to the programme are reviewed and selected items transmitted to key persons. An EPI Global Advisory Group has been established which includes national representatives from at least one country in each of WHO's six regions. This Group meets annually to review and assess the programme's progress and to advise on overall strategies and policies.

Regional resources

During the coming decade, the cost of fully immunizing a child against the six target diseases is likely to average approximately US \$ 3.00. In most countries, half of this amount will come from national resource (particularly covering items such as personnel facilities and operating expenses), and half from outside contributions (particularly covering vaccines, cold chain equipment and transport). Towards the end of the decade, as the goal of immunizing every child in the world is approached, the costs—to be met by donor agencies and governments—will increase to some US \$ 150 million per year.

Uncomfortable challenge

The Expanded Programme on Immunization presents the world with an uncomfortable challenge. Small pox eradication has in all probability been achieved, and the uplifting success of this worldwide collaborative effort has raised expectations of what ought to be achievable in the field of health. The Expanded Programme on Immunization is the logical follow-up to the smallpox programme, applying the lessons learned to many diseases instead of one, and focusing on the establishment of permanent systems for disease prevention rather than on a time-limited effort. It presents an uncomfortable challenge because its prospects for success are so bright, and the consequences of its failures are so grim—not only in human terms, but as an admission of inability to fulfil the promises of the primary health care approach. However, success *can* be achieved with the sustained commitment of recipient countries and the long-term support of donor governments and agencies.