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SURVEY ON THE NEEDS OF CHILDREN

REPORT BY THE WORLD HEALTH ORGANIZATION

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## 1. INTRODUCTION

In the Declaration of the Rights of the Child<sup>1/</sup>, the General Assembly of the United Nations adopted in 1959 what is probably among the most revolutionary documents of our time. The ideals which it embodies are ones which might well have been dismissed as impracticable and dubiously desirable a hundred years ago, even in the countries which are now most highly developed. The basic concept that the child has any rights of his own conflicts with the age-old belief that he was a chattel of his parents, and that the parents alone were responsible for his needs. If the parents failed to meet these basic necessities, the community might grudgingly keep him alive to be exploited, or apathetically let him die. This laissez-mourir attitude was well exemplified in almost all European countries until the beginning of the century by the infant mortality rates for illegitimate infants which were consistently and grossly higher than those of infants born to married mothers. It would be unrealistic to imagine that this reorientation to the rights and needs of the child, and the recognition of his importance as an individual, can take place overnight. There is still in the world a legacy of prejudice and fatalism which will only be overcome gradually as the standards of living and education of whole communities are raised. Since the needs of the child for health and well-being are inextricably related to the environment in which he lives, they must be met by improvement of his whole milieu.

Before considering in detail the basic health needs of children, it is relevant to review briefly certain biological aspects of childhood to which these needs relate.

The long period of intra-uterine life which the human young experiences is exceeded only by some other mammals, namely by those attaining much greater size or maturity by the time birth occurs. The period of post-natal immaturity is also exceptionally long, and is only equalled by that of a few very large mammals where growth may continue for as long as twenty years, although physical independence from the parent is attained considerably earlier than in the case of the child. The structure of the human family is also unique in the animal

kingdom, since in no other instance does the mother have a number of young of different ages, and in different stages of development, dependent on her at the same time. This is of real practical importance, since only the human infant is liable to be deposed from the centre of maternal care by the birth of a younger sibling before he has attained the capacity for chewing adult food, safe independent locomotion, and security from accident. Whilst the young infant will normally be suckled at the breast and so receive the food most suitable for his requirements, the toddler and pre-school child may only be given food which overtaxes his capacity for mastication and digestion. At the same time he may be exposed to a variety of hazards against which his mental and physical immaturity provide little protection.

The needs of the child in terms of health protection are directly related to the phases of development during which he is most vulnerable. During the antenatal period this protection must be directed to the mother, e.g. treatment or prophylaxis of infection and disease, adequate nutrition, psychological security, suitable conditions of work. During the birth process the protection must extend to both mother and infant. Throughout childhood and adolescence the child differs from the adult in three essentials, namely, continuous growth, development of structure and function, and peculiarities of immunity.

#### 1.1 Growth and development.

Growth is most rapid during intra-uterine life, and after birth during the first six months. Rapid but gradually decelerating growth occurs from birth to the age of five or six years, after which it normally continues at a slower but more or less uniform rate until the onset of puberty. The latter is characterised by a pubertal spurt of growth, during which the annual increment in height may be double that during middle childhood. Growth then decelerates and finally ceases after sexual maturity.

The requirements for growth must be added to the requirements for tissue maintenance and repair and energy expenditure. The periods of most rapid growth are therefore those during which the nutritional requirements per unit of body-weight are highest. Thus an infant during the first six months requires more

than twice as many calories per kg body-weight as does an adult man on heavy work. The calorie and protein requirements remain relatively high during the pre-school period when protein deficiency is most likely to occur and are again high during the pubertal spurt of growth.

Undernutrition or chronic disease of an essential organ will not only retard growth but may prevent the growth-potential of the individual being fulfilled.

It is generally recognized that the most immature organism is the most vulnerable, and that the mortality rates diminish in each succeeding age period of early life. The loss of early embryos from abortion is certainly very high though statistics are not generally available, and during the first trimester of pregnancy congenital malformation is liable to occur from a variety of maternal infections (of which rubella is the prototype) if they reach the embryo during the phase in which the formation of individual organs is occurring. Subsequently, abortions, premature births and stillbirths add to the quota of prenatal deaths. Infection of the foetus before birth, e.g. congenital syphilis, toxoplasmosis or malaria, is in general likely to produce more extensive or lethal effects in the immature organism than when the infection is acquired after birth.

The infant mortality rate (deaths per 1000 live births during the first year) has been widely used as a sensitive index of child health in the community. Available data show figures as low as 16 in Sweden or as high as 300 to 400 in some African and Asian communities. Unfortunately the statistics are less reliable or non-existent in many communities where they would be most valuable in assessing existing conditions. The infant mortality rate is normally very much higher than the death rate in any other year of childhood, again emphasizing the greater vulnerability of the youngest. In countries with low infant mortality rates, it is found that anoxia, birth injury, premature birth and congenital malformation are now the most important causes of death within the first week, and that subsequently infection assumes increasing importance. In

countries with high mortality rates the same causes of death exist but their relative importance is overshadowed early after birth by the impact of infections. During the subsequent eleven months of the first year, the diarrhoeal disorders are a major cause of death in all countries with a high infant mortality rate. In those countries the other major cause of death is represented by respiratory diseases and by some of the infections of childhood, particularly pertussis. Tuberculosis infection, when it occurs, is most likely to become disseminated owing to minimal resistance of the immature tissues. In the second half of the first year malnutrition in areas where it is prevalent begins to play an important role. Since all these causes of death can be successfully dealt with, this is the period when in the economically developed countries great declines of mortality rates have been achieved.

The age one to five years, conveniently referred to as the pre-school period, is the next most vulnerable period. It is significant that in countries which have achieved a low infant mortality rate, the greatest numerical saving of life has been in infants under one year, but the steepest decline in mortality rate has been in the age-group one to five. Where this decline in mortality has been achieved it has been largely the result of control of the common infectious diseases and their complications, and although the reduction or elimination of rickets and infantile scurvy has played its part, malnutrition in those countries has not been the greatest problem. In the developing countries, on the other hand, malnutrition following weaning is of outstanding importance, and contributes strongly to the mortality of this age-group.

Children of school age represent a selected community and will have surmounted a number of the hazards of infancy and of early childhood. The range of their activities beyond the immediate family circle may bring them into contact with fresh sources of infection or expose them to new risks of accident or exploitation. But, in general, physique and prospects of survival tend to improve throughout childhood. Since the principle of free and compulsory education has been generally accepted, children attending school are likely to be subjected to some conflicting influences. Even in societies where universal education has been accepted for several generations, there may frequently be some conflict between the disciplines of home and school.

Where the parents are themselves illiterate, the school child is required to learn skills of which his parents are ignorant and serves little of his apprenticeship for life within the home. Thus parental authority may be challenged and these inherent risks must be clearly recognized if they are to be overcome.

Puberty may be regarded as ending childhood. It is worth mentioning that since the age at which sexual maturation is reached varies widely in different individuals, and is on average two years earlier in girls than boys, no arbitrary age limit can be attached to "childhood". In all countries with a high standard of living for which figures are available, there is clear evidence that the average age of onset of menstruation is now earlier than it was fifty years ago. There is no evidence to support the popular belief that puberty occurs earlier in the tropics than in temperate climates. This has some importance, since this belief may influence legislation, e.g. age of consent or marriage.

Adolescence is a period subjected to particular stress, not only because of the problems arising from puberty, but also in view of the difficulties of the child's social adjustment which has largely been influenced by his family and school experience. In this respect the highly developed nations have in the past been notably less successful in promoting mental and social well-being than in improving the physical health of children. This is evidenced by the widespread emergence of the frustrated anti-social adolescent, the rising incidence of juvenile crime, and of neurotic illness. Whilst these evidences of social sickness are probably not wholly or even primarily attributable to the somewhat inflexible systems of compulsory education, they do at least suggest that the apprenticeship of the school child in the developing countries should aim to give him social adjustment as well as formal education.

## 1.2 Immunity.

The infant at birth may possess a substantial degree of congenital immunity to certain diseases to which the mother is herself immune, e.g. diphtheria, tetanus, poliomyelitis, measles and probably malaria. This is particularly

true in regions where infectious diseases are still highly prevalent. As this passive immunity is obtained from the mother through the placenta before birth, it is of comparatively short duration, and like all passive immunity is gradually lost. It may, however, be of great value in protecting the infant during the neonatal period before he has had an opportunity of providing immune bodies himself. Immunization of pregnant women against pertussis, poliomyelitis, tetanus, etc. has been practised with the aim of increasing the young infants' resistance to diseases to which he may be exposed at a particularly vulnerable age. Since the foetus has not normally been exposed to infection until the membranes have ruptured, the infant will have no acquired immunity at birth.

During the first month the newborn infant has for all practical purposes no capacity for producing immune-bodies, and the immunity responses of the young infant are less than those of the more mature infant and child. The capacity to produce immune-bodies may also be affected to some extent by nutritional status, and antibody-response is diminished in states of severe protein deficiency. In planning active immunization programmes, these considerations should be borne in mind. Against the very young infant's limited capacity for producing antibodies, and the possible interference from passive immune bodies, derived from the mother, must be set the advantages of protecting him as early as practicable from diseases carrying a high mortality in the youngest age groups. Against the diminished immune-response in the protein-starved individual, which makes prophylactic immunization less effective, must be set the greater risk if natural infection occurs. Among protein-deficient children, improvement of nutritional status should, if possible, go hand in hand with prophylactic immunization.

## 2. THE CHILD IN THE FAMILY AND IN THE COMMUNITY

In the economically advanced countries, the present century has been marked by an upsurge of child-centred thinking and planning which has been followed by a spectacular fall in infant and child mortality, development of the social services for children, care of the illegitimate, underprivileged or handicapped, a general improvement in child nutrition, a phenomenal development of educational facilities, protection of the child from exploitation in industry, and the

emergence of paediatrics as a major discipline including both clinical and, more recently, social aspects. The concept that the child is not a man in miniature but an individual having needs peculiar to his age and immaturity has been coupled with a growing recognition of his biological importance. This latter is exemplified by the fact that in previous epochs children were the first to suffer in times of national emergency, e.g. in the siege of Paris in 1870 it was estimated that scarcely an infant under three survived. In contrast, in World War II belligerents made every effort to protect children by allocation of priority rations, evacuation etc., even during the most critical periods.

There is perhaps a risk at the present time of considering the child in vacuo, detached from the community of which he is an integral part. Although the child certainly has needs which are peculiar to the young and growing individual, it is equally true that many of them are those of the community as a whole. Thus whilst it may be practicable to provide milk for infants and nursing mothers only, it would be ludicrous to allocate potable water on the same basis. Malaria control, eradication of yaws, and indeed the control of most communicable diseases and infestations, are likely to be particularly advantageous to the child but must be dealt with on a community basis. The same is true of sanitation and housing.

The World Health Organization has consistently emphasized this point of view. In a special resolution<sup>2/</sup> the Thirteenth World Health Assembly considered that "the health and welfare needs of mothers and children are inseparable from those of the family and of the community as a whole;"

and endorsed

"the policy of the Organization to collaborate, within the United Nations family, in activities which, taken as a whole, lead towards the fulfilment of the objectives expressed in the United Nations Declaration of the Rights of the Child".

The immediate family represents the biological unit best designed for the rearing of children, and whilst maternal care is of primary importance to the infant and young child, incompleteness of the family circle occasioned by absence

of the father or of siblings is likely to prejudice the child's opportunities for optimal development. At the same time, the family may prove to be the nidus of infection or discord to which the child is most intimately subjected. This is clearly seen in the case of tuberculosis, where primary infection in infancy or early childhood is most commonly acquired from a home contact. Dysentery, roundworm infestation and yaws are also very frequently household infections where treatment of the family as a whole unit may be as important as treatment of the individual child. Similarly, experience of conflict within the family at an early age may have a harmful effect on the child's psychological balance. Housing, sanitation, hygiene and mental health are essentially factors which affect the child as a member of a family group, and improvement of the child's environment must be effected through that of the family. The same applies to a considerable extent to child rearing in general, since the grandmother and older female relatives are those to whom the mother will usually first turn for advice and older siblings play a considerable part in caring for the younger infant. It is therefore essential that health education, particularly the teaching of the basic concepts of child care, which plays an important role in the promotion of better health, should be directed not only to the individual, e.g. the mother, but to the whole family and the community.

### 3. COLLECTION OF DATA

#### 3.1 Surveys

As a long-term objective, reliable vital statistics and morbidity data are obviously necessary if medical and sanitary effort is to be applied most effectively. However, since both imply advanced standards of medical and social service with facilities for accurate diagnosis and ascertainment, it is inevitable that developing countries may be unable to supply reliable information, particularly with regard to rural areas. The amount of time and money which should properly be devoted to obtaining data by ad hoc surveys before reliable registration of births, deaths and notification of certain diseases and conditions become established, must be decided at any given time in relation to the practical use to which such data can be put. If a pilot sample survey should indicate a high infant mortality rate, the immediate need

for setting up or extending maternal and child health activities within the basic health services for the community is obvious. This need not be delayed until the much more technical analysis of the causes of infant mortality and morbidity has been fully effected, since the major causes of death are rather easily established, if not in their exact proportion at least giving sufficient indication for orientation of the health programme. The first survey in this instance may be regarded as a "coarse adjustment", giving a general indication of population structure and of major phenomena producing high infant mortality. It can then be followed by more detailed examination under "fine adjustment" of child health problems in the area.

In discussing the measurement of levels of health the WHO Study Group in 1955<sup>3/</sup> endorsed the concept of multi-purpose surveys and special-purpose surveys.<sup>4/</sup> The multi-purpose survey should collect a wide range of data on relatively simple items including information on health conditions, environmental factors and health activities. This might provide some indication of local weaning and feeding habits, midwifery practice, water supply, employment, housing, transport etc. Each of these is likely to require expert assessment subsequently, but in the first instance the crude data may be sufficient for a start to be made in meeting some of the most pressing needs of the community. The multi-purpose survey would normally be planned with expert advice and supervision, but would employ non-professional interviewers and investigators. Such surveys are relatively economical in terms of highly-trained personnel.

Special-purpose surveys are focused on a particular health problem in a community, are carried out by professional personnel, and frequently require more elaborate and costly methods of ascertainment, e.g. laboratory facilities. Special-purpose surveys are likely to be required for the assessment of specific diseases in a community; for determining the major causes of infant mortality; for the collection of 'normal' anthropometric data on children; for assessing the effectiveness of services already established, etc. Since pregnancy, delivery, infant-feeding, weaning and child-rearing are largely conditioned by

local custom and belief, social anthropology should be represented together with the medical and sanitary disciplines in surveys of developing countries, in planning maternal and child health services, and in assessing the effects of technical change.

### 3.2 Child health and population growth.

No consideration of the needs of children can ignore the major problem of population increase which threatens to outpace attempts to raise the existing standards of living. In western Europe, the population cycle has been described as passing through four stages: the first high fluctuation with high birth rates and death rates; the second early expansion with high birth rates and falling death rates; the third late expansion with falling birth rates and low or falling death rates; and the fourth low fluctuation with low or fluctuating birth rates and low death rates. Most of the developing countries are now in the second phase of early expansion, i.e. with high birth rates and falling death rates, and it has been estimated that in many the population increase is as high as 2 to 3 per cent per annum. Were the present rate of increase to continue, a doubling of world population might be expected within fifty years. Death-control is becoming effective with increasing rapidity, e.g. in Ceylon the death rate was reduced from 22 to 12 in the seven years following the introduction of DDT spraying, a similar reduction having taken 70 years to accomplish by other means in the United Kingdom. Unless the developing countries can pass rapidly to the fourth phase with low birth rates, there is a prospect of exhaustion of world resources. Although some countries, e.g. India, have given family planning a high priority in their scheme of development, no method of control of birth can yet be said to fulfil the necessary criteria of being acceptable on religious and cultural grounds, of being medically safe and easily applicable, and of being sufficiently cheap to be within reach of population groups at the lowest income levels.

#### 4. NUTRITION

The first and most essential need of the child is for him to be adequately fed. There is little purpose in planning to safeguard his delivery, protect him from disease and accident and educate him if he is to succumb to malnutrition or is too hungry to learn. But the global problem of malnutrition is one which must be attacked simultaneously on many fronts, and is not one simply of food production. War on waste becomes an integral part of war on want. Waste may represent failure to utilize foods which are available, e.g. plant protein or fish; loss of food through defective storage and the inroads of insect or fungal pests; maldistribution; loss of food values through improper cooking and ignorance; and equally important, failure of the child to get full benefit from the food which goes into his mouth, owing to malabsorption, infection or parasite infestation. Put crudely, much of the food devoted to children goes to nourishing the worms harboured in their intestines, much is lost as the result of diarrhoea, and much again is ineffective owing to chronic infection of the host. Nutrition must be viewed in the light of its intimate relationships with almost every aspect of health promotion in childhood.

##### 4.1 Malnutrition and infection.

It is generally accepted that malnutrition frequently predisposes to infection, and also that infection is liable to produce or increase malnutrition. The close relationship between the two is well illustrated by the epidemiology of tuberculosis and by the effects of malaria on partially-immune children on a good diet compared with those whose diet is marginal. It has been mentioned above that protein-starvation, particularly, will depress the formation of immune-bodies and hence the resistance to infection. Similarly any factor interfering with assimilation or metabolism will result in secondary malnutrition. The correction of malnutrition cannot therefore be considered solely in terms of food production, transport, storage, distribution, preparation, and a stable balanced diet, though all are highly important. Where there is a high incidence of endemic malaria or parasitic infestation in children the developmet of programmes

against these diseases will require consideration at the same time as campaigns to improve nutrition. All these activities should be closely integrated with other public health measures. Programmes of this type are also of great importance in the control of the diarrhoeal diseases, which are not only one of the major causes of death and morbidity in infancy and early childhood in the developing countries, but may be intimately connected with the development of malnutrition in infants or in pre-school children.

#### 4.2 Nutrition during the first year.

The great majority of infants in the developing countries are breast-fed for at least six months and many for two or more years. Provided that lactation is adequate, that the mother is not herself suffering from gross vitamin deficiency, e.g. beri-beri, scurvy, or osteomalacia, and the infant remains free from infection, the first six months should normally present no major nutritional problem. Later, however, lactation is more likely to prove insufficient in total quantity, and breast-milk is inadequate in iron-content for the growing infant's needs. Although it is often advocated that mixed feeding should be started early in the first six months, the risk of precipitating diarrhoea by introducing infection in very young infants probably outweighs any theoretical advantages under poor hygienic conditions. It is usually inadvisable, and sometimes disastrous, to encourage early weaning in a community in which prolonged breast-feeding is the rule and safe milk otherwise unobtainable, since even a relatively small amount of breast-milk will supply essential protein and will normally cover a proportion of the infant's vitamin requirements. In communities in which particular vitamin deficiencies, e.g. infantile beri-beri or xerophthalmia are observed, it is of the utmost importance to investigate local diet, feeding habits, and possible sources of vitamin which might be utilized. The vitamin requirements of the infant can often be covered from local sources.

The introduction of additional protein into the diet during the second six months represents what is perhaps the major nutritional problem in countries where milk is not available. Whilst distribution of dried skimmed milk has been of the

greatest value,<sup>5/</sup> it cannot possibly be a global substitute for the efficient utilization of local products which are sources of animal or vegetable protein. Since it has been recognized that in many areas of the world locally available sources of animal protein are at present insufficient, increased attention is given to the use of vegetable proteins. Such preparations of suitable vegetable protein must be palatable, and if possible resemble some article of diet with which the mother is already familiar. Thus in Central America a protein-rich preparation (Incaparina<sup>a</sup>) has been produced by the Institute of Nutrition of Central America and Panama (INCAP) in Guatemala which superficially resembles the maize gruel in common use, and has been successfully marketed on a commercial basis.

#### 4.3 Weaning.

The time when the infant ceases to be given the breast and is entirely dependent on food other than breast-milk is notoriously hazardous. Even in countries where liquid or processed cow's milk is readily available, it is desirable for weaning from the breast to be carried out gradually. Otherwise in countries where the water supply may be dubious, milk unavailable, and the staple diet deficient in protein, the infant is suddenly exposed to protein deprivation and infection. If he is already taking soft solids containing iron, protein and vitamins before he is completely weaned, the transition is effected more readily. Nutrition teaching should be directed particularly to this period, including the safe preparation of foods suitable for the toddler. Too often he is simply given highly seasoned scraps from the household diet which he may be unable to chew or digest, and which, moreover, are potential sources of infection.

#### 4.4 Nutrition from 1 to 4 years.

In economically developing countries, the pre-school age-group is the one that is liable to be most neglected, e.g. following the birth of a younger child, and is often the most difficult to help, since the child is seldom brought to the health centre except when he is ill. It is the age most likely to suffer from the alternate "feasting and fasting" indulged in by many communities.

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<sup>a</sup>Composition of Incaparina: 38% cottonseed flour, 29% corn meal, 29% sorghum, 3% Torula yeast, 1% Ca carbonate and Vitamin A at 20 000 I.U./lb.

The need is for regular small meals, rather than for a single large meal followed by prolonged hunger.

Protein malnutrition in this age-group is sufficiently widespread to represent a major world problem. The florid syndrome of kwashiorkor has been recognized in most of the developing countries, and should be regarded as an index of protein malnutrition in the pre-school children, since every case of frank kwashiorkor is likely to indicate a much larger number of cases of mild to moderate protein deficiency in the area. The problem is not only one of finding or providing protein-rich food which is palatable and locally acceptable, but also of getting it to the children most in need of it. The techniques of health education, the local possibilities of food production and distribution, group feeding and the stimulation of commercial distribution are all ones which should be specifically explored in each area.

#### 4.5 Nutrition during school age.

The child of school age is in a much better position than the toddler, since he is normally able to adapt to the adult household diet more or less successfully, even if this is inadequate. It is frequently observed that the nutrition of school entrants of five or six years improves steadily throughout childhood. When children are congregated in school, the distribution of school meals or milk or milk-substitute becomes a more practical method of reaching school children requiring supplements. The introduction of gardening as part of the school curriculum may be of great value in helping to produce school meals, whilst in some parts of Africa it has been found that strict supervision of what is sold by itinerant traders who provide the school shop may be a practical method of improving nutrition. The children who do not go to school are a greater problem, since they are not under the direct supervision likely to detect malnutrition or infection.

#### 4.6 Nutrition teaching.

This should be given high priority in programmes of health education and should be directed not only to the individual but also to his family and community, since it is not always the mother who decides what shall be eaten in the home.

Whilst the health centre, where both individual advice and group talks and demonstrations can be given, is the logical starting-point, it must be admitted that the teaching actually given in MCH centres is of very unequal quality and is more likely to be effective when supported by home visiting. To be effective nutrition teaching must fulfil at least the following requirements.

It must be based on a knowledge of existing local food habits and taboos, local cooking facilities, local market prices and commodities, and some idea of the average income of the audience; it must be simple, comprehensible and practical; its purpose must be clearly understood by the teacher; it must be flexible and persuasive, directed to local conditions rather than dealing with rigid principles, and it must be interesting. The use of aids such as demonstrations, filmstrips, flannelgraphs etc. is usually more effective than posters. A simple manual specially prepared for the use of health personnel in the particular area is invaluable but is often not available. The publication of such texts should be regarded as an essential contribution to nutrition teaching. The use of textbooks in areas for which they are inappropriate is likely to do more harm than good.

From the report on child care and nutrition education in MCH, presented to the twelfth session of the UNICEF/WHO Joint Committee on Health Policy<sup>6/</sup> it would appear that most of the nutrition teaching is given by nurses or midwives, and that doctors participate to a much smaller extent. In view of its outstanding importance, medical staff might be encouraged to contribute to it, particularly by making some objective assessment of its effectiveness. The role of the nutritionist in maternal and child health services was emphasized and certainly the nutritionist, agricultural adviser and sociologist could all make an invaluable contribution to providing the background information for a particular area.

To improve nutrition education techniques and disseminate knowledge in this field, joint FAO/WHO seminars have been held in the South-East Asia, Western Pacific and African Regions. The Nutrition Committee for the Middle East sponsored jointly by FAO and WHO in its first session<sup>7/</sup> emphasized the need for extending education in nutrition in the region and gave special attention to schools, maternal and child health services, community development and/or rural welfare programmes as channels for carrying out education in this field.

## 5. CONTROL OF INFECTIOUS DISEASE

The health hazards and their relative importance will clearly differ from country to country, and health programmes must be formulated after ascertainment of the particular hazards to child life in the area concerned. This is particularly applicable to communicable diseases which will be given a high priority in areas where they are prevalent. Reference will only be made here to some of those conditions which can be regarded as a global menace to child health. It should be remembered that many of the diseases now regarded as "tropical" occurred at one time in Europe or North America and were eradicated or controlled before the full armamentarium of modern medicine became available. Plague, cholera, trachoma, leprosy, typhus, malaria and smallpox are examples. In the case of certain diseases, the introduction of a single therapeutic agent has made mass eradication practicable. For instance the large-scale availability of penicillin has made the various anti-yaws campaigns outstandingly successful in a way that would have been impossible without this agent.

### 5.1 Malaria.

It was estimated in 1952 that the total annual number of cases of human malaria averaged 350 million, with a mean mortality rate of 1 per cent. A substantial proportion of this mortality and morbidity occurred in children. Since the discovery of insecticides there has been intensified effort to control the disease and during the past ten years a trend towards its eradication has been established. In some countries eradication has already been effected, and others are progressing towards this state. In spite of the very great advances which have been made during the past decade, it would be unrealistic to minimize the enormous drain on human vitality for which malaria is still responsible. In fact, in those areas where the disease is holoendemic, adults represent a selected population which has reached an uneasy modus vivendi with the parasite at the price of the high death rates in early life.

### 5.2 Tuberculosis.

The disease is of world-wide distribution, occurring in all climates, and although the incidence in different countries now varies very widely, it has been estimated that 0.5 to 1 per cent. of the total adult population of the world

suffers from active infection. Since no age-group is immune, active adult cases are potential sources of infection of infants and children with which they are in contact. The disease is particularly liable to become disseminated and lethal if acquired in infancy.

During the past ten years, the systematic use of tuberculin testing, mass radiography, BCG vaccination and chemotherapy have made possible much more effective ascertainment, protection and treatment. Following a number of controlled trials indicating that BCG vaccination gives approximately 80 per cent. protection, BCG vaccination programmes have been carried out in 64 countries with the assistance of WHO, UNICEF, and the International Tuberculosis Campaign and have been described as "the largest international vaccination programme and probably one of the largest international health programmes in the world today".<sup>8/</sup> By the end of 1959, 265.4 million tuberculin tests and 105.7 million vaccinations had been effected. The consolidation of internationally-assisted BCG programmes into national ones has continued, the evidence provided by the first phase of the campaign serving as a basis for future planning, standardization of vaccine and procedures, and control.

National antituberculosis programmes have included the establishment of central and mobile dispensaries, tuberculin-testing, mass-radiography and more recently oral domiciliary treatment of both open and inactive cases. Tuberculosis is a social disease in that its incidence is related to low standards of living and hygiene, overcrowding and malnutrition. The prevention of infection in childhood must therefore be integrated with attack on the disease in the family and the community as a whole.

### 5.3 The diarrhoeal diseases.

The outstanding importance of the diarrhoeal diseases as causes of death in infancy and childhood has been somewhat obscured in health statistics by differing nomenclature and classification. The WHO Study Group on Diarrhoeal Diseases<sup>2/</sup> stressed the need for statistics on all forms of diarrhoeal diseases, i.e. those in which diarrhoea is a major manifestation, thus including diarrhoea

of the newborn, gastroenteritis and colitis, the various dysenteries and a number of diseases now separately classified but in which diarrhoea is a predominant symptom. Although the available evidence is very incomplete, it is probable that diarrhoeal diseases may account for 30 to 50 per cent of the infant mortality in some areas, and a somewhat lower mortality but high morbidity in toddlers and children of pre-school age. In a study of protein malnutrition in children under five in Southern India, it was found that 25 per cent of all the children examined had a history of recurrent diarrhoea, that 12 to 18 per cent had diarrhoea at the time of the examination, and that over 10 per cent of the siblings had died from diarrhoea or oedema or both.

In those countries where the incidence of diarrhoeal diseases is highest, Shigella infection is now probably the chief pathogenic agent in adults and children. In infants under one year, in whom the mortality is highest, however, the pathogenesis is frequently obscure, and there is an urgent need for the collection of more epidemiological data by planned surveys of selected communities in developing countries.

Measures to combat the diarrhoeal disorders must be directed to the whole family and furthermore include facilities for immediate therapy and broadly-based sanitary and hygienic procedures directed to the prevention of ano-oral spread. Since dehydration and loss of electrolytes are the most serious disturbances in infancy, treatment must aim at early rehydration, either by oral or by parenteral administration of fluid and electrolytes depending on the gravity of the case. Whilst the best results in serious cases are likely to be obtained by intravenous rehydration in hospital, this may be impracticable for the majority of cases, and local rehydration centres have been established in some areas, where ambulatory or day-treatment is carried out.

In prevention, the major objectives will include provision of easily-accessible piped water, reduction of the fly index, improved standards of food-handling and home hygiene and sanitary disposal of excreta. Since the Study Group reported in 1958, a WHO Diarrhoeal Diseases Advisory Team has been

appointed, consisting in the first instance of an epidemiologist, a bacteriologist and a paediatrician, the function of the team being to assess national programmes and to recommend control measures; to advise governments interested and willing to concentrate efforts in the field of diarrhoeal disease on planning in relation to their medical and public health laboratory facilities, and to collect data on incidence, epidemiology, and mortality. The three WHO International Reference Centres for the identification of enterobacteria, together with the network of national Shigella and Salmonella Centres, are already carrying out important work in identifying organisms, advising on the preparation of typing sera and on isolation techniques etc.

#### 5.4 Neonatal tetanus.

Although tetanus infection of the newborn infant is not of comparable importance to malaria, tuberculosis or the diarrhoeal diseases, it is responsible for a high mortality in many areas where delivery and neonatal care take place under unhygienic conditions. The infection most commonly gains access at the time of cutting or dressing the umbilical cord. It is particularly likely to do so when the cord is cut on a mud floor without attention to asepsis, or when the dressing consists of mud or dung. Prevention is essentially a matter of improved midwifery practice and home hygiene, though since the traditional manner of dressing the cord may be conditioned by religious belief, this must be taken into account in instituting change.

#### 5.5 Immunization

In addition to BCG vaccination, the immunization procedures most generally required in infancy and childhood are those against smallpox, diphtheria, pertussis and tetanus. National immunization campaigns in a number of the more advanced countries have eradicated smallpox and very greatly reduced diphtheria, the latter becoming of minimal incidence when 60-70 per cent of pre-school children have been immunized. Mass vaccination against poliomyelitis has been effected in the Union of Soviet Socialist Republics, the United States of America, Canada and a number of European countries.

"The role of immunization in communicable disease control" was the subject selected for the technical discussions at the Thirteenth Assembly of the World Health Organization. Two basic schedules of immunization were discussed;<sup>10/</sup>

one being designed for areas with adequate health services, the other for areas with inadequate health services. It was generally agreed that these schedules were acceptable but that they would often need modification to suit local conditions. Thus when triple antigen (diphtheria, pertussis and tetanus) is used, in areas with adequate health services, three injections at not less than four-weekly intervals should be given between two and six months, a fourth between 15 and 18 months, and booster doses of diphtheria and tetanus antigen at five years and nine years. However, all schedules aiming at the protection of children from the most prevalent diseases involve repeated visits and accurate recording, and put great demands on the staff. In the developing countries, the number and spacing of the injections required to produce satisfactory immunity to diphtheria, pertussis and tetanus, in addition to smallpox and BCG vaccination, have limited their general application, owing to lack of staff and facilities. Typhoid-paratyphoid vaccination is given in several countries, and may be required according to local circumstances. Vaccinations against cholera and yellow fever are indicated in areas where the diseases occur.

Maternal immunization during later pregnancy, designed to transmit congenital immunity to the foetus, has been advocated against polio, pertussis and tetanus, but there is little information with regard to the effectiveness of the last. It could not be regarded as a substitute for hygienic handling of the cord.

In spite of the inherent difficulties in effecting multiple-immunization procedures on a large scale in developing countries, the mortality from the common infectious diseases of infancy and childhood, particularly from whooping-cough, is so high that immunization programmes deserve a high priority. Although no vaccine against measles is yet generally available, the complications of measles are also so serious in small children that the distribution of gamma-globulin for prophylaxis in contacts, e.g. in infant wards or institutions, is a very real need.

Recognizing the need for assessing the potency of vaccines widely used today against various communicable diseases and for setting up international standards where appropriate, WHO has embarked on a programme to establish recommended

international minimum requirements for vaccines and similar products under the aegis of the Expert Committee on Biological Standardization.

## 6. CONTROL OF PARASITIC INFESTATION

It is hardly possible to estimate the morbidity directly due to parasitic infestation, which is commonly associated with malnutrition and low standards of living. This condition contributes very largely to the background of disease in a substantial proportion of the world's children. Only the commoner and more important infestations will be considered here, though others, e.g. onchocerciasis causing blindness, may have great local importance in areas where they are prevalent.

### 6.1 Intestinal parasites

With the exception of threadworm infestation which is of world-wide prevalence but of little clinical importance, intestinal parasites are found very much more commonly in tropical and subtropical areas than in temperate climates. Probably the most widespread infestation is with the large roundworm, Ascaris lumbricoides, followed by hookworm which predominates in some areas. Other helminthic parasites having considerable importance are whipworm infestation (trichuriasis) and Strongyloides. In the case of Ascaris, hookworm and whipworm, the ova escape in the stools and become infective in soil. Infestation with Ascaris and whipworm occurs by ingestion of contaminated food or water. The larvae of hookworm and Strongyloides cause infestation by penetration of the intact skin, as is likely to occur when barefoot children play on infected ground. In all cases infestation is most likely to occur in early childhood, and prevention should be directed

to the sanitary disposal of excreta and to home hygiene. The symptoms of infestation are likely to be most severe when the worm load is very heavy and causes severe anemia, and when there is associated malnutrition.

Although mass treatment with the drugs now available makes it practically possible to reduce the level of infestation in the child population of a community, it can only be fully effective if reinfection of the ground, food or drinking water can be prevented by environmental sanitation. It is in relation to these conditions that excreta disposal finds one of its greatest justifications, and that health education of the family and of the community plays an important role.

## 6.2 Bilharziasis

This is particularly an infestation of middle and later childhood, acquired through bathing, paddling or washing in infested water. The parasites have an intermediate host in various species of snail, and from the snail pass through an aquatic cercarial stage during which they can penetrate the child's skin. In areas where the disease is prevalent, a very high proportion of children are likely to become infected by the age of twelve, and to show blood in the urine or stools with a variety of other symptoms.

Control or reduction of the disease has been attempted with various molluscicides, since if the intermediate host can be eradicated, the life cycle of the parasite is broken. Although this offers a more realistic approach than attempting to prevent all local children from playing in infested water, it presents many practical problems which have not yet been entirely solved. As the disease is responsible for a high morbidity in areas where it is endemic, it is one which requires not only concerted attack on the intermediate host, but also ascertainment and treatment in children, since they are the main source of infestation.

## 7. MENTAL HEALTH

For many years it has been recognized that experiences during childhood, particularly during the first years of life, have a decisive influence on the later development of the individual, and as a result considerable attention and research have been devoted to this subject. There are crucial periods in physical and emotional development during which an integrated approach to the child and his family is of great importance.

It is generally acknowledged that emotional aspects play a significant role during pregnancy, and that considerate handling of the mother and, indeed, of the whole family, is helpful in preparing for the arrival of the baby and in preventing many future anxieties and conflicts.

The great emotional significance of childbirth is sometimes overlooked. Sufficient knowledge of the emotional aspects of pregnancy and maternity and an understanding of family relationship problems can do much towards improving emotional adjustment to the new situation, and fears which arise from traditional beliefs can often be allayed by imparting some knowledge of gestation and birth.

The first essential for harmonious development in the early years of life is a good and continuous relationship between mother or mother substitute and child. The opportunity for the formation of close family relationships from the beginning of life is one of the most important factors for the healthy development of the individual. If these relationships are broken or if the child is otherwise deprived of the chance to form satisfactory emotional ties in his early years, his character and his social behaviour in later life may be deeply affected. His capacity for co-operation with other human beings may be seriously impaired, resulting in severe psychological maladjustment. Pressure towards premature social performance appears also to be among the causes of emotional disturbance in later life.

The effect of change on the infant differs from that on the older child. For example, an alteration of environment such as migration from a rural to an

urban community or a change of cultural patterns affect the infant in so far as the family life is disturbed or unbalanced by these events. Change which is accepted and agreed upon by the family does not usually affect the child emotionally, while stresses which upset the family may severely influence it, even though the "filter" effect of parental or extended family protection continues to function.

Problems may arise, at a later stage, from the increasing social experience of the child through contact with an expanding environment from pre-school through school age and puberty. During this period the child emerges definitely from the home into the broader social sphere. Kindergartens and schools provide a good opportunity for health workers to get in touch with the children themselves and with teachers and parents, and to discuss possible problems of the children's mental health. In collaboration with the teaching staff, much can also be done to create a school milieu favourable to the development in the young of friendly and trustful attitudes towards society.

While the planning of elaborate mental health services has not yet been given a high priority in countries where basic material necessities are still lacking, it is important that those responsible for health services should be alive to the problems of mental health and should ensure that members of their staff concerned with child care, health education, improvement of nutrition etc. are aware of mental health principles applicable in everyday life. The staff of MCH services has the important responsibility of reassuring mothers in their maternal role in order to sustain, strengthen and stabilize the relationship between them and their children. MCH workers should understand the normal growth and development of a child, the development of its intelligence, speech and motor activities, and should be familiar with the basic needs and problems of the early years. Their attitude towards different cultural patterns and social groups should be free from prejudice and hostility, and in dealing with the family and the community they should take into consideration traditional beliefs and attitudes concerning the upbringing of children. Health personnel exercise great influence in the home in this respect, and if already known to and accepted by the family, the health worker may have access to the key person of the social unit, who may be the father, grandmother, or some other person. This close and friendly contact with the family gives him an unequalled opportunity

to discover, and possibly to improve, disturbed parent-child relationships and if necessary to refer severe cases of emotional disturbance to the appropriate treatment centre.

Besides providing guidance and direct help to the family, MCH services should endeavour to influence general community values and to improve attitudes which may be conducive to mental disturbance in children. This can be done partly through consultative services to persons socially influential in the community, such as teachers, ministers and others, by assisting them in their efforts to improve the mental health of families.

Emotional problems of the sick child play an important role in clinical paediatrics. In the economically developed countries, the advances of paediatrics during the last decades have been tremendous, and diseases that were formerly a scourge have been brought increasingly under control. At the same time as the decrease in importance of these diseases, emotional problems have come to the fore and are given greater recognition by parents, health workers and educators. This new development calls for more consideration of mental health problems in the training of physicians and other health workers, who should be given the foundations for an understanding of the emotional problems of childhood. An adequately trained physician should be able to recognize the emotionally disturbed child and, in cases which are beyond his competence, to refer the child for specialized treatment without potentially dangerous delay. He should be aware of the important role played by emotional disturbances in diseases such as asthma, anorexia etc. encountered by him and treated almost every day. He should also have an understanding of the importance of the right psychological approach to chronic disabling diseases such as diabetes, physical handicap, rheumatic fever etc., which overshadow the whole life of a child and require especially sensitive handling.

The hospitalization of young children may also result in emotional problems. In many cases it has been found advantageous to admit the mother to the hospital together with the sick child although this may sometimes interfere with hospital routine and may cause inconvenience in the domestic life of the family. This is one problem which would seem to need further study.

Emotional problems are to be feared even more in the institutional care of children. The staff should be well trained in this respect. An important

measure is to keep the child under the care of the same person as long as possible, since staff changes, confronting the child with frequent separations, can be very harmful.

#### 8. DENTAL HEALTH

The promotion of dental health should logically start with attention to the diet of the expectant mother, since calcification of the deciduous teeth occurs during foetal life. Thus fluoridation of drinking water is likely to have maximum effect in preventing dental caries if the fluorine is incorporated into the developing teeth before birth.

It has been strongly recommended that where possible the first dental inspection should be at 2-1/2 years if practicable, in order to preserve the first dentition. Instruction in oral hygiene should be included in health education at all levels.

The two major problems to be dealt with in childhood are dental caries and periodontal disease. In general, the incidence of caries is highest in urban communities, and particularly in those where the fluorine content of the water is low and where refined sugars are excessively used. Periodontal disease is often widespread in countries where the incidence of dental caries may be relatively low. Ideally, dental inspection and any necessary treatment of caries or periodontal disease should not only start in the pre-school period but be continued throughout school life. As the number of trained personnel available makes this quite impracticable even in many highly developed countries, school dental inspections are commonly much less frequent and pre-school dental services, in association with MCH or dental centres, are rarely available except in urban areas. The shortage of qualified dentists can be met in part by the training of auxiliary dental personnel. By this means the dentist can supervise the treatment of a very much larger number of patients. WHO has emphasized this approach in the report of the Expert Committee on Auxiliary Dental Personnel<sup>11/</sup>. UNICEF has already provided dental equipment for treatment of children in a number of health centres.

#### 9. ACCIDENT PREVENTION

The importance of accidents as a cause of mortality in infancy and childhood has been highlighted in the highly developed countries by the continued fall in deaths from other causes, with the exception of cancer. During the first year of life, the accidents most likely to cause death are suffocation, e.g. from

inhalation of foreign bodies, and falls. From one to five years the incidence of accidents rises steeply, the most important being accidental poisoning, burns and scalds, drowning and road accidents near the home. After the age of five, road accidents increase greatly in incidence, though drowning and burning remain important causes. After the first year, boys are involved very much more frequently than girls. For every fatal accident, it should be remembered that there are very many more non-fatal accidents which may cause disablement or disfigurement, whilst the even greater number of hair-breadth escapes must be taken into account in accident prevention programmes. Accident prevention is being given most serious consideration by countries with low mortality rates from other causes. The WHO Advisory Group on Prevention of Accidents in Childhood<sup>12/</sup> emphasized the importance of the epidemiological approach, and the necessity of establishing the relevant facts, e.g., the place and circumstances in which the accident occurs, the age and type of child involved, as a basis for planning for accident prevention. Thus it was found in a morbidity study in an area of the United States of America that in children under five years the total accident rate is not only very much higher than for the general population, e.g. 207 per 1000 of the population studied, compared with an over-all rate of 125 per 1000, but the majority of such accidents occurred within the home or its immediate neighbourhood. The report instances some of the preventive measures already taken in a number of countries, to which might be added the establishment of central poisons bureaux, designed to give immediate information of the composition of any proprietary or other preparation which may have been absorbed, and the antidote. Similarly accident treatment centres for children, where treatment of bony and cranial injuries, lacerations, burns and scalds, and poisoning can be given under optimum conditions, are now established in a number of countries.

Although the concern with accident prevention and treatment has been shown primarily in highly developed countries, it must be emphasized that accidents in childhood are a world problem. The developing countries are also deeply involved, even if this problem is overshadowed by the major causes of death,

communicable diseases and malnutrition. The prevalent agent of accident will clearly vary in different communities, for example, motor transport playing a more important role in urban communities, probably burns and scalds under primitive conditions of cooking, drowning where there is free access to water etc.

For countries where programmes are being developed it is extremely important to determine the prevalence and type of accident and to plan prevention appropriately. On the basis of this assessment, measures such as town and road planning and security devices in the home may be adopted, as well as health education aimed at parents and children, and, indeed, at the whole community. In fact, education can be said to be the key-note of prevention in the widest sense of the word. The parents and the community should be educated in the particular hazards to which children are subject at specific ages and in the measures which can be taken against them, while the parents and school can make the child aware of the accident-hazards of everyday life and of the means of avoiding them.

#### 10. CARE OF THE HANDICAPPED CHILD

When the whole child population is first brought within a system of compulsory education it is inevitably found that a number of children are incapable, owing to physical or mental defect, of being educated in schools planned for the normal. The trend has been for governments, local authorities and voluntary agencies to accept increasing responsibility for these handicapped children, and to provide appropriate education facilities or care with the purpose of developing their limited potentialities, and if possible rendering them capable of becoming fully or partially self-supporting in a sheltered environment. Educational facilities may be provided in special classes within ordinary schools, in special day schools, in residential schools or institutions, or in the home which may only be practicable when the parents are themselves able to undertake a substantial part of the educational programme. Even with the greatest efforts, there will always remain a number of children with such gross mental defect that only physical care is possible.

### 10.1 Early ascertainment

Increased emphasis should be placed on early ascertainment, because at present many disabilities are not recognized until the child is required to attend school, when many opportunities have already been lost. This is particularly important in the case of congenital deafness and blindness with normal mentality, since the best results in rehabilitation are likely to be obtained if special training can be started early.<sup>13/</sup>

### 10.2 Physical handicap

In addition to children who are totally blind or partially-sighted, totally deaf or 'hard-of-hearing', those requiring special facilities or long-term care include cases of cerebral palsy, sequelae of poliomyelitis, epilepsy, rheumatic and congenital heart disease, orthopaedic deformities, e.g. congenital or tuberculous disease of bone, the late results of rickets, injuries etc. Since many of these will require long-term medical supervision, orthopaedic treatment or physiotherapy in addition to education, the best results are likely to be achieved when both health and education are supervised in the same centre. This point of view has been expressed by the Joint Expert Committee on the Physically Handicapped Child convened by WHO with the participation of the United Nations, the ILO and UNESCO.<sup>14/</sup> Adequate care of the physically handicapped child is one of the more expensive items in a comprehensive child health programme, and in developing countries it may be even more important to establish adequate programmes to prevent handicaps such as blindness due to trachoma, ophthalmia, or vitamin A deficiency, than to care for those already blind, particularly since there are many physical handicaps which there is at present little prospect of eliminating.

### 10.3 Mental handicap

The number of low-grade mental defectives in a community is greater than might be expected from a normal distribution curve of intelligence, since it will include children where brain damage has occurred from extraneous causes such as birth-injury or infection, who might otherwise have developed normally.

In countries where every effort is made to keep such children alive, they represent a considerable burden on the community in terms of institutional care. Feeble-minded children with intelligence quotients of approximately 60 to 75 are not the same problem, since although they will require supervision, they are usually educable within the range of their capacity, and many will subsequently be employable on simple, repetitive work.

In 1953 the Joint Expert Committee convened by WHO with the participation of the United Nations, the ILO and UNESCO, discussed the problem of the mentally subnormal child<sup>15/</sup> and considered that two guiding principles in regard to physically handicapped children seemed applicable to the former also, namely, that

"Every child has the right to expect the greatest possible protection against the occurrence of preventable physical or mental handicap before, during, and after birth.

"Every child also has the right to develop his potentialities to the maximum. This implies that all children, irrespective of whether or not they suffer from mental or physical handicap, should have ready access to the best medical diagnosis and treatment, allied therapeutic services, nursing and social services, education, vocational preparation, and employment. They should be able to satisfy fully the needs of their own personalities and become, as far as possible, independent and useful members of the community."

The Committee also emphasized the need for further research into all aspects of subnormality, for continued reevaluation of existing services in relation to community needs, and the integration and development of services.

#### 10.4 Maladjustment

Emotional maladjustment, sufficient to interfere with educational progress and social well-being, is now regarded as a major cause of handicap in the highly developed countries, and provision is made for its treatment in child guidance clinics, adaptation classes in school, and in special residential schools. Since the standards used in diagnosis and ascertainment are apt to be subjective, it is difficult to assess the true incidence in highly developed communities, and still more so in developing countries. Mental defect frequently has an emotional overlay, but this is not invariably the case.

Similarly the delinquent child may be emotionally maladjusted, but it must be emphasized that delinquency is a legal rather than a medical concept.

## 11. MATERNAL AND CHILD HEALTH SERVICES

Historically, child health services were developed through the efforts of pioneering paediatricians for the survival of young infants in the face of highly excessive infant mortality. Their concern was centred on the holocaust of very young infants who became the victims of early weaning under circumstances that did not ensure safe artificial feeding. The concept developed that mother and infant are an indivisible entity, and through the increasing recognition of the special needs of the child during the whole period of its development the maternal and child health services have come to embrace the whole period from conception to adolescence.

Originally developed as a voluntary effort, maternal and child health services are now becoming a vital point of government concern in the establishment of their health programmes. In those parts of the world where such services were first established they have tended to be self-confined, but the recognition that the young child is an integral part of the family unit and is the first endangered by insanitary environment has established the interdependency of maternal and child health services and of general health services for the family and the community.

### 11.1 Organization and administration

In reviewing the 1955 the organization and structure of the maternal and child health services the WHO Expert Committee on Maternal and Child Health<sup>16/</sup> pointed out the importance of the establishment of a maternal and child health administrative unit at the national level as an essential for adequate organization of services, and stressed the need for integration of the programme for mothers and children with the general health services. According to the Committee, a comprehensive programme for mothers and children should provide care for the pregnant, parturient and nursing mother, and continuing health supervision and care of the child from birth through childhood and adolescence;

include the study of the problems affecting the health of mothers and children and provide for statistical and demographic data on which programmes could be based and priorities determined; include the health education of parents and of the community; co-ordinate its activities with those of other government and voluntary agencies serving mothers and children; include the evaluation of the efficiency of services provided, research into new methods, and the utilization of the maternal and child health services for the training of professional and auxiliary staff.

These provisions may be regarded as counsel of perfection when the developing countries need to establish priorities in the comprehensiveness and orientation of the services for mothers and for children of the various age groups. However, effective services will not be developed in the absence of at least a nucleus of an efficient administrative structure and a sound policy for the training and employment of professional and auxiliary personnel. There is at present no doubt that objective evaluation of requirements and the efficiency of the services rendered is often apt to receive much less attention than it deserves.

From the beginning WHO, in its programmes of assistance to governments, has placed great emphasis on the training of personnel, and on the demonstration of how MCH services can best be organized and carried out in different areas. In its initial phases, WHO assistance to training centred mostly on the development of demonstration and training projects. In these projects, to which UNICEF often contributed equipment and supplies, WHO personnel, in close co-operation with their national counterparts, aimed at demonstrating satisfactory methods of maternal and child care and training local staff in the necessary techniques. The most important results of these projects were that they provided large numbers of trained health workers; many of them became the starting-point of more comprehensive local health services, and others led the people to appreciate health services or introduced preventive medicine to the area.

Throughout the world tremendous strides have been made in the development and expansion of health services, including maternal and child health. The fact that most of the developing countries have established at the national level a maternal and child health administrative unit is evidence of the growing concern with mothers and children who in all countries represent a sizable portion of the over-all population. However, there is much to be done to place these administrative units under the direction of well qualified and experienced maternal and child health administrators, to establish administrative units at intermediate levels, to provide for effective supervision of maternal and child health activities at local levels, and to analyse critically the orientation of the programme and the results that are obtained by the services that have been established.

In addition to government bodies such as maternal and child health departments, national, regional or local advisory committees can play a useful role in outlining areas of special interest and in helping the government determine priorities. These committees may be interested only in research and indicate areas most suitable for the study of a given problem, or they may be in constant advisory relationship to the government maternal and child health departments responsible for the organization of MCH services. They are formed by leading specialists in the problem under consideration, including public health administrators, obstetricians, paediatricians, nurses, midwives, nutritionists, epidemiologists, statisticians, educators, social scientists, and can play a very important role in stimulating interest in their field.

#### 11.2 Orientation of programmes

In terms of orientation of programmes there is first of all the awareness of the great impact that programmes for control of environmental sanitation and for the fight against major communicable diseases and against malnutrition will have on the health of mothers and children in areas with high maternal and child mortality. This is reflected in the activities of the international agencies concerned.

In the maternal and child health programme proper the change in the direction of the programme in countries at different stages of development is based on the needs under these different circumstances. Those countries which have successfully reduced their maternal mortalities provide in general adequate facilities for hospital or for domiciliary deliveries, for prenatal supervision of the pregnancy and postnatal care of the mothers. They become increasingly aware of the importance of the emotional adjustment of many women to their pregnancy and motherhood. They have programmes oriented towards reduction of perinatal mortality. In the developing countries where pregnancy and childbirth are still accepted as a matter of course, programmes are focused on prevention of malpractice during delivery, including the supervision and training of traditional birth attendants and on the correction of disease endangering the lives of future mothers and their offspring. In terms of prevention of major causes of maternal mortality the interest in the technologically advanced countries centres on toxæmia, whereas in developing countries infection, hæmorrhage and malnutrition are still the focus of attention.

Programmes for child care in most of the economically advanced countries routinely develop for infants and children of all age groups along separate lines of prevention and of treatment of diseases and early correction of defects or maladjustment. There is however increasing awareness that there is no fundamental virtue in such rigid separation of prevention and treatment.

While the principle of prevention underlies fundamentally the establishment of all health services in view of the high dividends that can be expected for the expenditure provided, experience has shown that it is impracticable and even impossible in most areas of the world to establish services without integration of prevention and cure. The recognition of this fact is very important in considering the development of infant and child health services.

So far in most developing countries the effort has been concentrated on the infant in view of the higher mortality of that age period, and older children, particularly the age one to four, have received much less attention. However, the increasing awareness that in these countries mortality in infancy is only four to six times higher than in advanced countries, whereas in the age group one to four years the mortality is often 20 to 30 times in excess of that in countries with low infant and child mortality, has focused attention on the fact that some

preventable causes determine the high mortality in both age groups, thus calling for continuity of action at least through pre-school age.

In the last ten years considerable effort has therefore been made to influence child health beyond the period of infancy, although this is not easily put into practice. The co-operation of the mother and her willingness to bring the infant to the health centre, together with the successful establishment of vaccination and immunization schedules against specific diseases, provide the possibility for systematic individual supervision and for counselling mothers on an individual basis. Children of pre-school age are usually much less readily brought to health centres than are young infants, and their systematic supervision is thus made more difficult. It appears that for this age period, in dealing with the basic problems of malnutrition, diarrhoeal disease, respiratory diseases and specific communicable diseases of childhood, there is the greatest need for supplementing individual counselling with group teaching of mothers and home visiting. Indeed, in areas with limited personnel, more might well be achieved if successful group teaching could be carried out through the organization of community educational programmes. It has been pointed out in the technical discussions at the Twelfth World Health Assembly that "health education ... is not a programme, distinct from other public health programmes" but is "one of the fundamental public health methods that assist in achieving the goals of a public health programme."<sup>17/</sup>

In economically advanced countries the supervision and care of children is now successfully carried out through school age and adolescence, and is concerned with correction of defect or handicap, and with the developmental and psychological problems that arise in those age-groups, as well as with education in health matters. This is feasible on a large scale for school-age children, since compulsory educational systems exist that enable the health programme to reach the whole age-group and possibly to establish a screening procedure for those in need of care. In the developing countries there are many obstacles to the establishment of a full-blown service for school-age children. For in addition to the inability to provide routinely the specialised services for correction of defect or handicap there is the basic obstacle of low school attendance that will often limit the programme to only a fraction of the

population of that age. However, even so, this programme has considerable value since schools do offer an unequalled opportunity to reach families as well as to attack specifically prevailing diseases. Furthermore, the educational programme in schools will be an avenue for betterment of understanding for healthier living by future generations. For developing countries this is perhaps the most valuable aspect of the school health programmes. Recognizing the important role of the teacher, WHO and UNESCO in a Joint Expert Committee<sup>18/</sup> discussed the opportunities of the teacher in health education and outlined some approaches for the improvement of teacher preparation in this field.

## 12. PAEDIATRIC SERVICES

In well organized health services there should be the closest co-operation between the public health and preventive aspects on the one hand, and the therapeutic and hospital services on the other. This is not everywhere the case. Integration of preventive and curative services for children is best achieved if a permanent channel of communication between the health centre or the out-patient clinics and the hospital paediatric services is established. The same personnel may serve in both the maternal and child health services and in the children's ward or hospital out-patient department. This is a great advantage to both the MCH worker and the clinical paediatrician in countries with highly-developed paediatric services and full-time maternity and child health physicians, as well as in countries with much more limited possibilities in MCH services. The MCH worker has an opportunity to improve his professional skill if he has free and regular access to the hospital and, where possible, to the university department of paediatrics. On the other hand, the clinical paediatrician who is given the possibility of working in the preventive and public health service gains a deeper insight and understanding of the life of the community whose children are under his care.

### 12.1 Hospital services

In all the highly-developed countries the principle has been accepted that infants and children should be accommodated in specially designed and equipped wards with suitable facilities for supervision, preparation of feeds, prevention of cross-infection, and treatment. The admission of small children to adult

wards is undesirable on both physical and psychological grounds, and where separate children's wards are not justified or feasible, at least separate rooms for children can be organized even in very modest conditions. Wherever possible, provision should be made for the admission of nursing mothers with their infants and this is sometimes usefully extended to older children.

Medical care of sick children is best in the hands of those with specific paediatric training. Where qualified paediatricians are not available the general practitioner needs to be given additional training (in-service or refresher courses) which will enable him to deal adequately with paediatric problems. It is also desirable that at least the head nurse should have had paediatric nursing training. Under optimum conditions, biochemical, radiological and ancillary services will be adapted to paediatric requirements.

The out-patient department for children should also be separated from that for adults or clinics for children may be held at a special time. Provision should be made for isolation of potentially infectious cases awaiting attention, as the large mixed waiting room is a common site of cross infection. The out-patient department should also include facilities for emergency treatment. Since it is generally undesirable to admit small children to hospital and to separate them from their mothers, unless absolutely necessary, an efficient out-patient department for children is of even greater importance than in the case of adults. A valuable addition to out-patient facilities is a limited number of "day beds" where investigation or treatment can be carried out during the day and the child discharged home in the evening, e.g. after rehydration.

In many countries considerable attention has been given lately to premature care programmes. Although the definition of prematurity, which was endorsed in 1950<sup>19/</sup>, was set at a birth weight of 2500 grams or less, the majority of infants between 2000 and 2500 grams in the highly developed countries do not require special premature care, and at least some of them are in fact small full-term infants. In countries where the average birth weight is considerably lower than in the USA or Europe a much greater proportion of infants will be below 2500 grams at birth, and even more of these are likely to be small full-term infants.

Although much attention has been devoted to the care of the premature infant in technologically highly developed countries, where premature units are included in large maternity hospitals, it must be admitted that follow-up studies of surviving prematures have not been uniformly encouraging. This is particularly so in the case of infants of very low birth weight, which are the ones demanding the most prolonged and expensive hospital care.

In developing countries with high neonatal and infant mortality rates, it would appear more productive to concentrate on lowering mortality by other means than intensive premature care, which is most demanding in terms of equipment and personnel. In so far as maternal malnutrition and poor ante-natal care are factors often associated with premature birth, improvement of these may be expected to reduce the incidence of prematurity. The public health aspects of low birth weight have recently been studied by the WHO Expert Committee on Maternal and Child Health<sup>20/</sup>, which met in Geneva in November 1960.

#### 12.2 Domiciliary care

The pattern of medical care of children in their homes will inevitably vary from country to country, and within social groups in the same country, depending on such factors as the standard of living, housing conditions, family structure, the ratio of doctors to population, the facilities for home nursing, the hospital staff and facilities available. In the case of professional domiciliary deliveries, the care of the newborn will normally be supervised by the midwife or in certain cases by the obstetrician. When the delivery has been conducted by a traditional birth attendant, the newborn infant may be subjected to a variety of traditional practices, some of them being dangerous, others relatively innocuous. The general approach should be to discourage only that which might harm the infant and to provide the traditional birth attendants with qualified supervision and additional training in regard to child care. The use of auxiliary midwives as part of the maternity care team was discussed by the WHO Expert Committee on Midwifery Training.<sup>21/</sup>

### 12.3 Paediatric specialists.

While certain countries, e.g. the United States of America and the Union of Soviet Socialist Republics, have a high ratio of paediatricians to general practitioners, and paediatricians cover much of the domiciliary care of sick children, in many other countries the routine medical care of sick children in the home is carried out by general practitioners. Fully-trained paediatricians serve only in a consultant capacity, and are usually responsible for the care of children in hospitals. There is however everywhere an increasing recognition of the need for a cadre of highly-trained paediatric specialists who should not only be responsible for the care of children requiring specialized hospital investigation or treatment, but should also undertake teaching and research, and be competent to advise on paediatric policy and the planning of child health services in co-operation with the public health authorities.

Since paediatrics, as a separate discipline, has come into the field considerably later than obstetrics, many developing countries still have lamentably few paediatric specialists in comparison with the magnitude of their paediatric problems. The extent to which the need has become recognized during the past decade is reflected in the number of doctors from developing countries going abroad for paediatric training, and to take higher qualifications in paediatrics. The encouragement of this trend by the award of fellowships has been a notable contribution to child health. From 1947 to 1959, WHO has awarded 891 fellowships for study abroad in the field of paediatrics and maternal and child health. Most of them were for physicians, but a number of nurses, midwives and other personnel were also included. Another type of assistance to training has been the assignment by WHO of teaching staff to medical, nursing and midwifery schools, and to training programmes for auxiliary personnel, to aid the governments in establishing or improving their training programmes and to provide trained personnel, mainly for maternal and child health centres. UNICEF has contributed the necessary equipment to many of these training institutions. The creation of international paediatric training centres in certain developing areas where prospective leading paediatricians could gain working experience in conditions comparable to those prevalent in their own countries deserves serious consideration.

#### 12.4 University departments of paediatrics and institutes of maternal and child health.

These are primarily concerned with teaching, training and research. In most instances, university departments are responsible for the teaching of paediatrics to both undergraduates and to post-graduates. The institutes of maternal and child health are primarily concerned with post-graduate teaching and research. In some countries they also serve as centres for methodology and act as an advisory body to the national or local MCH service. The support which has been given by international agencies (WHO and UNICEF) to the establishment of chairs of paediatrics (e.g. in Uganda) to university departments or institutes of paediatrics (e.g. in Afghanistan, Indonesia, Burma, India, Egypt, the Philippines etc.) and the training of key staff should prove one of the most fruitful means of teaching undergraduates and post-graduates in their own country, improving local standards of paediatric practice, and stimulating much-needed research.

Staffing of university departments should be designed to teach not only clinical but also social aspects of paediatrics, and to work in the closest co-operation with the department of social medicine and the MCH and school medical services where the latter are not in the framework of MCH. Demands for assistance from the university department of paediatrics are likely to come from a wide variety of other disciplines, e.g. social sciences, psychiatry, education, anthropology; from government departments and hospital planning authorities, and from other groups such as teachers, parents' associations, probation officers, etc. If the department is adequately staffed, its influence can permeate very widely through the community. In developing countries the demands are likely to be particularly heavy, and the department of paediatrics or institute of child health should be in a key position to bring together the various agencies concerned with the welfare of children, and to advise on policy.

#### 12.5 Teaching

Clinical paediatrics is normally taught to undergraduate medical students during their final or penultimate clinical year, though many of the more progressive medical schools are also introducing paediatrics at intervals

throughout the curriculum, emphasizing their practical aspects. The total teaching time devoted to paediatrics varies greatly in different schools, and is often disproportionately small in relation to the importance of the subject. Since even in countries with a relatively low birth rate in general practice a high percentage of the clinical work may be paediatrics, in developing countries with high infant and child mortalities, paediatrics is even more important in the training of future doctors, and the medical curriculum should be designed accordingly. The subject is only likely to receive its proper status when there is a university department of paediatrics which is independent of obstetrics and general medicine, though working in close association with both.

Post-graduate teaching and training has been referred to above, and whilst key personnel will derive much benefit from supplementing their home training abroad, future paediatricians in the developing countries will be best oriented towards the problems of their own country if post-graduate training at a high level can be given locally.

The many aspects of paediatric teaching were discussed by the WHO Study Group on Paediatric Education in 1956. In view of the major role of child care in general practice, the special characteristics of childhood and the desirable content of a programme of paediatric teaching, the Group considered it essential that paediatrics constitute one of the major subjects of the medical curriculum.<sup>22/</sup>

The importance of paediatric teaching in the training of all nurses, and particularly public health nurses, is generally accepted. In the case of midwives, particular emphasis must be placed on the care of the newborn and young infant. The amount of further paediatric teaching given to the midwife must be decided in view of the duties she will be required to undertake. Unless she is required to have practical training in paediatric nursing, theoretical teaching is of very limited value. Where auxiliaries constitute a part of health personnel, it will be necessary to give them basic training in child care.

#### 12.6 Research

The university department or institute of child health is the obvious centre on which paediatric research should be based, and facilities for research must be

provided if the teaching and clinical work are to be of high quality and if the department is to justify its existence. This involves adequate staffing on a permanent basis, and facilities for postgraduates to be attached for work on ad hoc projects. Research must not necessarily be confined to universities and institutes, and a well-staffed hospital can very successfully undertake research in a field to which it is particularly related. In many of the developing countries, the organized collection and analysis of anthropometric data on infants and children may be a necessary first step in the organization of other projects. A department oriented towards social paediatrics is particularly well placed to undertake both long and short-term research which may influence the development of the paediatric services and practice in the area.

### 13. SOCIAL SERVICES

Although no attempt will be made to discuss the detailed structure of the social services for children as they have evolved or are now developing in different countries, emphasis must be placed on their close relationship to child health and survival. The fact that in some of the highly developed countries there has been increasing separation rather than closer integration of the social and health services, which may be the responsibility of different ministries, is no matter for congratulation. Indeed, the developing countries might well take warning from some of the overlapping and deficiencies in responsibility for child care which have resulted.

#### 13.1 Care of illegitimate and deprived children.

Since marriage, implying some degree of permanency, and a family comprising husband, wife (or wives) and children is generally regarded as the normal basis of human communities, the illegitimate child, or the one deprived of one or both parents by death, divorce or separation, is commonly at a disadvantage. It should be remembered, however, that permanent marriage is not necessarily the general rule in all communities. In some countries of Latin America, for

example, a large proportion of the couples living together in nuclear families are living in free unions and many homes have no male head-of-household. Although a sufficiently strong mother-child relationship or the support of the extended family, where it exists, may offset some of the disadvantages of illegitimacy or deprivation, it has been pointed out that the mortality of illegitimate infants is consistently higher than that of those who are members of a complete family. Care of the illegitimate child is intended to overcome this reduced expectation of life and to rear the child with a minimum of social and physical handicap. This may be done through support of the mother, though she will almost invariably have to seek employment and delegate much of the care of the child to other people. The crèche or day nursery may be the means of child care selected in the circumstances. If the mother relinquishes or abandons her child entirely, the principal means of child care available are (1) adoption, (2) placing in a supervised foster-home, or (3) care in a children's home.

### 13.2 Adoption

Under favourable circumstances, this may be the most satisfactory solution if the child then becomes a member of a family. Whilst in certain countries immediate relatives are frequently the adopters, the demand for infants for adoption in other countries now exceeds the supply, and a willing adoption is usually preferable to a grudging acceptance by relatives. The laws governing adoption vary considerably in different countries, but are now generally framed to protect both the adopted child and the adopting parents. Thus the child and the prospective parents should have a full examination to exclude physical and mental defect, an assessment of the home and reasons for the adoption should be made and in order to prevent emotional disturbances for all concerned, the adopters' rights should be protected against the mother changing her mind, once the adoption has been legally effected and the child settled in its new environment.

Although many adoptions are still made through a third party, the officially recognized adoption agencies are generally in a better position to arrange a suitable adoption, and to mobilize the necessary skills, e.g. of health workers,

psychologists and social workers which may be required for assessment of the child, the mother's circumstances, and those of the proposed adopters. Special training of those dealing primarily with adoptions has been recommended by the Joint UN/WHO Meeting of Experts on the Mental Health Aspects of Adoption.<sup>23/</sup>

### 13.3 Foster-homes

The child who is taken into a foster-home has some of the same advantages as an adopted child, but the arrangement is a temporary one, the foster-parents being subsidized for the care of the child. The mother or agency acting in loco parentis retains the right to remove the child from the foster-home, and the foster-parents may relinquish their care at will. In many ways a good foster-home is preferable to an institution, but it is essential that foster-homes should be supervised to avoid health hazards, neglect, cruelty or exploitation. Frequent changes of foster-home are particularly undesirable, and are likely to undermine the child's security and emotional development.

### 13.4 Children's homes and institutions

The problem of the care of children outside their own homes has long been of concern to the United Nations and to the various specialized agencies, as well as to voluntary organizations. The Bureau of Social Affairs of the United Nations Secretariat has published a series of studies on this subject. As early as 1949, the members of the WHO Expert Committee on Mental Health expressed the strong opinion that "only where family care proves for some reason impossible should recourse be had to institutional care."<sup>24/</sup>

Children's institutions may be organized by religious or other voluntary bodies, or by the local authority or state. In countries with difficult economic conditions which cannot afford adequate accommodation or staff satisfactory in quantity and quality, the fate of children living in such homes is most unfortunate. Even within the highly developed countries, the standard of child care is very variable, and some homes still retain the bleak "charity orphanage" atmosphere with little attention paid either to the child's physical health or emotional development. It must be remembered that with the high

staff-child ratio which is necessary to run a really satisfactory children's home, the costs of maintenance are usually very high, much higher than maintaining a child in a foster-home. The health needs in children's homes require skilled supervision, and though many of the attending personnel have had some training, their selection is generally based primarily on character and temperament, with little regard to professional skill. Institutions admitting infants require an even higher staff-infant ratio and more expenses than in the case of older children. Here the consideration of health aspects is of the utmost importance. The risks of cross-infection, e.g. infantile gastro-enteritis and respiratory infection, are very high unless the standards of hygiene are impeccable. The nutrition of infants in institutions is frequently very unsatisfactory and deserves special attention.

### 13.5 Crèches and day-nurseries.

Day-care centres have different objectives and functions than children's homes. They are a relatively new institution arising in countries where social and economic change, industrialization and urbanization, cause young mothers to accept paid employment outside their home. They are thus especially for children from isolated families in large cities and for children of unmarried mothers or mothers separated from or abandoned by their husbands, who have no one to care for them at home while the mother is away at work. In circumstances where daily separation is unavoidable, the crèche may serve to prevent the mother from abandoning the infant. Day-care centres are frequently the result of social legislation compelling industries of a certain size to provide such centres for the infants of their female workers. In addition, there are usually other day-care centres supported by state or municipal authorities or by welfare organizations. In addition to children of working mothers these also care for children from especially unfavourable social environments such as the children of the unemployed or from slum areas. A certain type of day-care centre exists in some areas in the country and is in operation only during certain peak seasons of work, as for example, at harvest time when the whole family is away for days working in the fields.

Essentially a day-care centre looks after healthy children whose permanent residence is their home and not the day-care centre. The child's family ties therefore remain to a certain extent, since it is the function of the day-care centre to replace the mother on a temporary basis rather than on a permanent one, and not to weaken or undermine her relationship to her child in any way, in so far as this is possible.

From the health point of view it is important that day-care centres in some countries are concerned with the youngest age-groups, from children aged from a few weeks to three or a maximum of five years. Since children of this very young age are extremely vulnerable in many health aspects, the same risks of cross-infection apply to the crèche and day-care centre as to the residential institution and there is an added likelihood of infections (e.g. measles, whooping cough, diarrhoeas, respiratory infections) being introduced from the home. The emotional and educational problems of these age-groups are also very complex and important and require particularly careful attention.

### 13.6 Kindergartens

Whereas the crèche and day-care centre are planned for the mother's working hours, the kindergarten is primarily child-centred. Group activities are systematized and designed to further the pre-school child's development and social adaptation.

### 13.7 School meals services.

The provision of school meals proved so successful in many countries in improving the physical status of schoolchildren that it was introduced as a permanent feature. In countries in which malnutrition is a major problem, the distribution of food through the schools has obvious advantages, since it is eaten under supervision, encourages school attendance, and can be cooked and distributed more economically than through the home. The principal disadvantage is that school terms cover only a limited part of the year. Unfortunately, the millions of children who do not go to school are not benefited.

### 13.8 Physical recreation in school curriculum.

Increasing emphasis is being placed on the importance of including physical training and organized games within the school curriculum. The barrack-square type of drill is being replaced to an increasing extent by the type of gymnastics and games which are physiologically preferable and can be actively enjoyed by children. There is no general agreement as to the exact proportion of the school week which should be devoted to organized physical recreation, and it will in any event have to vary with local circumstances.

### 13.9 Group activities.

These play such an important part in the social development of the child that the provision of facilities should be regarded as an integral part of the health needs of children. They are not primarily a substitute for maternal care, but are complementary.

#### 13.9.1 Pre-school playgrounds.

The high incidence of accidents and malnutrition in pre-school children is an additional reason for bringing this age-group under supervision where there are no kindergartens. The provision of safe playgrounds, or even streets closed to traffic during certain hours in built-up areas, is relatively inexpensive, though adult supervision is required. The value of the playground is greatly enhanced if it is used as a distribution centre for meals or milk, which are consumed under supervision rather than going into the family pot.

#### 13.9.2 Playgrounds for older children.

These should be regarded as an essential of both school design and town planning. The need is obviously much greater in urban than in rural areas, but even in the latter it is generally desirable to have sites definitely allocated for organized games and recreations.

#### 13.9.3 Youth clubs and organizations.

These are based on the assumption that every child and adolescent should have a certain amount of leisure time, some of which is best used in group activities. Since these are essentially voluntary, the youth club or organization must have something to offer which will make the child wish to join, sustain his interest, and further his health and social development.

#### 13.9.4 Camps

Camping is excellent for children, especially those who cannot go on holiday with their parents, in providing them with an opportunity for rest and recreation under supervision, as well as adequate nutrition. It has been extended to assist many groups of handicapped children who are particularly deprived of normal activities, e.g. spastics, diabetics, those suffering from the sequelae of polio etc. Camping may also play a valuable part in rehabilitating maladjusted children and delinquents.

#### 14. SUMMARY AND CONCLUSIONS

It is stressed that the health needs of children cannot be considered apart from the needs of the family and of the community as a whole.

The needs of the child are reviewed in relation to the biological structure of the family, and of his natural development. They include antenatal care of the mother and safe delivery. After birth, the child's vulnerability and need for protection derive from his immaturity of structure and function, his continuous growth, and his lack of acquired immunity. The most vulnerable phases of development are discussed.

The necessity is emphasized for surveys in determining the child's particular needs and hazards in any given area. The implications of population growth for child health are discussed.

Although adequate nutrition must be given the highest priority amongst the needs of children, it is intimately related to the control of infection and parasitic infestation which play a fundamental role in child health. Campaigns to improve nutrition must therefore be linked with broadly-based public health programmes, of which immunization procedures, environmental sanitation and health education are vital components.

Optimal emotional development depends on the fulfilment of the infant's and child's needs for affection and security. While the first is normally provided by the mother and kin, security may be prejudiced by a changing environment. Mental health principles should form an integral part of the training of health

workers, and should be applied by MCH and other health personnel as well as by educators in their everyday work.

Dental conditions are responsible for much preventable ill-health in childhood. Practical aspects of the control programme are discussed.

Accident prevention should receive urgent attention both in developed and developing countries. The importance of an epidemiological approach to accidents is emphasized.

The care and education needed by handicapped children and recommended methods are outlined.

The activities of maternal and child health services are reviewed with particular attention to some outstanding problems. For instance, attendance of children from one to four at services provided for them in many countries is low and irregular. As a result, a particularly vulnerable age-group in these areas lacks much-needed attention. As maternal and child health activities occupy a very important place within the public health services, objective assessment of their effectiveness with a view to improving their deficiencies is essential. Some points requiring particular investigation are discussed.

In considering paediatric services, the role of university departments of paediatrics in training, research, and promoting activities concerned with child care in the community is stressed. The need for the collection of anthropometric data on infants and children in different countries is indicated. The place of programmes for premature infants within the total child care services is discussed.

The various methods of caring for illegitimate and deprived children are considered, including adoption, foster-homes, and institutional care. The last is considered the least satisfactory, particularly in the case of infants.

The increasing importance of day-nurseries in countries where mothers work outside their homes is discussed.

The provisions which should be made for group activities and recreation for children are outlined and the importance of school meals is emphasized.

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