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**HEALTH PROBLEMS OF
ADOLESCENCE**

Report of a WHO Expert Committee

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1965

**WHO EXPERT COMMITTEE ON THE HEALTH PROBLEMS
OF ADOLESCENCE**

Geneva, 3-9 November 1964

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HEALTH PROBLEMS OF ADOLESCENCE

Report of a WHO Expert Committee

The WHO Expert Committee on the Health Problems of Adolescence met in Geneva from 3 to 9 November 1964. The meeting was opened by Dr P. Dorolle, Deputy Director-General, and Professor J. B. Richmond was elected Chairman, Professor J. Čížková Vice-Chairman, and Professor D. Hubble and Dr M. G. Williams Rapporteurs.

INTRODUCTION

Adolescence is a process—a series of varied, rapid and extensive changes—as well as a period of life. It encompasses the age range of about 10-20 years. At some time between ten and fourteen, individual girls and boys, each according to his own growth pattern, begin to become adult; and at some point between sixteen and twenty each one's rate of maturation will have markedly decelerated. In the intervening years, an adolescent may experience various transient difficulties, which, while hardly to be considered abnormal, may nevertheless affect his health, behaviour and efficiency.

Adolescence is characterized by a series of biochemical, anatomical and mental changes that are not found in members of other age-groups. It is these rapid, extensive changes that differentiate adolescents from children and from adults and that must be taken into account when adolescents and their health problems are being given attention. Social factors, too, since many of the changes are closely related to them, will need careful consideration.

During early adolescence, various hormones rise rapidly from their childhood levels, growth is accelerated and secondary sexual characteristics develop. These changes mark the onset of puberty and usher in the post-pubertal period of maturation or adolescence proper. The sequence in which they occur varies little from one adolescent to another, but the age at which they begin, the age at which the adolescent reaches an adult state, and the rate and extent of growth all vary considerably. This is true not only between the sexes and between persons of differing ethnic groups and cultures, but also between normal persons of the same sex and similar backgrounds and opportunities. Girls usually begin to mature, and also achieve maturity, about two years earlier than boys, while, on the average, the physical growth of boys is greater than that of girls.

The illnesses of members of this age-group have received considerable medical attention for many years in many countries, but physicians as a whole have not given adolescents the care that they have given to children and adults. Medical students and physicians have been taught less about adolescents than about other age-groups, less research has been carried out on their disorders and fewer facilities have been provided for their care. Yet the future effectiveness of these young people depends in no small part on the care given them during the formative years of adolescence.

Although the numerical size of the adolescent group is in itself no more than a minor reason for increasing the attention given to the group, it is worthy of mention that, in the age-group 15-19 alone, there are already some 300 million adolescents in the world, and it has been predicted that these numbers will increase rapidly during the next decade.

One reason for the comparative neglect of adolescents is that they are generally regarded as being a healthy group. It is true that their morbidity and mortality rates are low and that adolescence can claim comparatively few medical disorders as exclusively its own. However, improvement of the health of adolescents and of the social conditions that affect them adversely should surely be a matter of general concern. Moreover, many of the disorders peculiar to them, such as acne, gynaecomastia, metropathia, slipped femoral epiphysis and certain emotional difficulties, are far from insignificant, and the rates of sickness, injury and death among adolescents are still considerable.

Some of the diseases that afflict the adolescent are discussed in this report, and particular attention will be called to disorders that should have been dealt with before the adolescent stage was reached, such as musculo-skeletal, visual and hearing defects, and some mental disorders.

However, it is not only because of these considerations that adolescents should be given an increased amount of attention and that physicians and all health personnel should be trained to understand them more fully. The compelling reason is that adolescents differ physiologically and psychologically from children and adults, and these differences should be better understood, more widely taught and more consistently remembered. Only when this has been done will it be possible to take adequate account of such factors as the rapid growth of adolescents, their high degree of activity, the interrelationship of their growth and their endocrine systems, and their requirements for a healthy personality development.

It is wise also to bear in mind the great influence of the adolescent's childhood environment on his health and personality and the effect of any remedial measures on his future as an adult. In fact, the value of any proposed remedies should not be finally judged until there has been an opportunity to observe the adolescent in his later adult life. There is a great need for research which takes these thoughts into account.

1. THE ADOLESCENT IN SOCIETY

All who are concerned with the development of adolescents into responsible and effective adults or who attempt to understand, to treat or to prevent their disorders will have to take into account the impact that their families and the outside world have upon them. As they mature, they are increasingly affected by the traditions and attitudes of the society in which they live, by its vigour and cohesiveness, by its competitiveness and pace, and by the kind of decisions that it compels them to make.

Changing social conditions affect the adolescent as he emerges from the childhood state of being cared for to one of assuming responsibility. He gradually progresses from prescribed education to a form of training that he is able to select for himself, from attending school to going to work, from living at home to establishing a home of his own.

More years of schooling, the steady increase of urbanization, the continuing shifts of population, and the rapid changes in the types of employment available are but a few of the developments that may not only provide adolescents with new and broadening opportunities, but also contribute to their vulnerability.

The family is of primary importance to the adolescent. It is within the family that he learns, as a child, to express his feelings and to control his emotions, and it is the family's background and resources that determine the degree of support that he receives and the breadth of his outlook and opportunities. An adequate psycho-social family structure will help him to mix with his contemporaries and later to adjust himself harmoniously to adult society.

Singular as it may seem, it is the physicians and health workers concerned primarily with children (maternal and child health, etc.) who are in the best position to prevent the ills of adolescence. This fact will be illustrated repeatedly throughout this report.

Beyond the family circle, society as a whole has a strong influence on the adolescent. He wants to participate actively in it and to contribute to it, and this involves the exercise of ethical choices—itself a crucial aspect of personal development.

As adolescents strive to express their ideals, to gain their own identity and to emancipate themselves from home, they commonly seek the membership of a group, espouse its cause and receive its temporary support. If their experiences are with constructive groups having desirable goals, it is likely that their attitudes and activities will be healthy ones. Over the years, youth movements have fulfilled some of these functions.

In general, the more advanced an adolescent's society is in its technology, the more prolonged is his social maturation. In highly industrialized countries, his assumption of an adult role depends on his meeting complex

and high standards. Often the prolonged period of study required for specialized occupations delays the age of self-support, the opportunity for marriage, and the age at which a creative contribution to society can be made.

Poverty as a socio-economic factor tends to handicap the adolescent's efforts at self-improvement ; it shortens the time available for his education and narrows his opportunities for beneficial experiences. The adolescent in an environment of poverty is preoccupied with acquiring the basic essentials for life itself.

An adolescent who is the victim of discrimination for religious, ethnic, political or economic reasons may be particularly vulnerable. Growing up as a member of a deprived or of a rejected group, it is difficult for the adolescent to focus on the values of society at large. Instead, he is likely to develop hostility towards its norms and a disposition to anarchistic individualism. However, even in these circumstances, good leadership and opportunities to channel his energy to constructive ends can foster his development towards responsible citizenship.

In some cultures, the onset of adolescence is signalled by puberty rites. Though not without their own problems, puberty rites, by promoting higher social and personal integration, tend to confer upon the adolescent a strong group identity and status. Because these rites yield the experience of a shared satisfaction of deep emotional needs, they are believed to promote close relations between those adolescents who participate in them.

The concern for human betterment and the constructive, searching, suprapersonal drive of the adolescent are moulded and shaped by the values of the cultural environment that surrounds him. Its very nature leads to questioning, to the examination of basic premises, and to dissatisfaction with what he sees as imperfections in the world the preceding generations have provided. The cultivation of this propensity for meaningful social activity and its channelling into a coherent value system and into constructive action, should be the serious concern of adults.

2. GROWTH AND DEVELOPMENT

2.1 Anatomical and physiological aspects

In early childhood, growth and development progress at an even and moderate pace, but from about the age of ten onwards there is a marked rise in hormone activity that ushers in the physical changes that characterize adolescence. These changes usually occur in the same sequence, but their timing, rates and extent are extremely variable even among perfectly healthy adolescents ; they may be modified by a variety of hereditary, environmental, nutritional and emotional factors.

Because of the wide variations, between individuals, within families and between those living in different countries, in the time at which these changes occur, developmental age is a more appropriate yardstick than chronological age. For example, measurements of height and weight are not in themselves always sufficient to permit a valid description of the normality of a particular adolescent's growth, but when they are combined with some index of his state of development (e.g., state of secondary sexual characteristics, the relationship between his upper and lower body segments or his bone age) a more accurate and more useful description, but not an appraisal, can result.

Standard tables that combine these data are available for some populations, but it is important to emphasize that an adolescent's wide variation from such standards should not be taken as evidence, *per se*, that his individual growth pattern is necessarily an unhealthy one.

It should also be emphasized that serial evaluations will be found to be much more valid than those made at a single point in time. Health workers who use growth data would be advised to think in terms of developmental age and to remember the wide variability of normal growth patterns. These concepts are as valuable in educational, industrial and vocational spheres as in medicine and public health.

The concept of growth potential is also useful. Growth potential is influenced initially by genetic, and then by antenatal and perinatal factors. After birth, the attainment of innate growth potential depends on favourable environmental circumstances, among which are adequate nutrition, positive emotional support and the absence of disease.

The facts concerning the secular trend in growth and development are well documented. It seems that the menarche is occurring earlier now than in the nineteenth century. Growth acceleration has apparently accompanied this trend, and ultimate height and weight show a similar tendency to increase. There is some reason to believe that this trend may soon cease in those groups whose environmental circumstances have been favourable for many years.

Growth and development studies would permit more effective planning of long-range health-care programmes for adolescents and would also yield further facts for improving medical teaching and for the assistance of those who plan educational and vocational programmes. Wherever possible, such studies should include the previous years of childhood in order that the continuity of the growth process can be given due consideration. Unfortunately, very little is known of the differences in the patterns of physical and mental growth and development in various parts of the world, and comparative studies would be valuable.

There is a need for the standardization of methods of assessing growth and development, including criteria for making and analysing measurements. Only when such standards exist can comparative cross-cultural

studies be really valid. Basic data should include such items as age at menarche, height and weight by age, one or two secondary sexual characteristics and, wherever possible, estimates of biochemical parameters such as haemoglobin. Precise information on chronological age is essential for correct analysis and interpretation of growth data.

In situations where special conditions, trained investigators and adequate equipment exist, more detailed and refined investigation should be encouraged. Short-term longitudinal studies should be considered, since this method can yield much valid and useful data in a relatively short time. Subgroups of contrasting socio-economic strata in each society should, if possible, be included.

2.2 Mental and emotional aspects

The mental and emotional aspects of development are considered separately in this report, but obviously they are closely related to the physical and physiological aspects of adolescent development.

In adolescence there is an acceleration of cognitive growth and of personality development, both of which are subject to further, but less rapid, evolution during later years. There is also an intensified preparation for the assumption of an adult role, a process which nears completion when society accords the adolescent his full adult prerogatives. The age at which termination is reached and the nature of the prerogatives vary widely from society to society.

Experience indicates that adolescence is less likely to be difficult, prolonged or poorly resolved if it follows the successful accomplishment of the development processes of infancy and childhood. In the absence of definitive evidence, it would seem correct to assume that, even where there existed deficits in childhood, repair can occur. The task of the physician and others dealing with adolescents is to pursue ways and means of promoting optimal growth of the adolescent who has been deprived as a child. At the same time, it is well to remember that, although positive experiences in adolescence provide an excellent foundation for an effective, healthy adult life, the one does not necessarily follow the other. Much depends on the provision of opportunities during later years for the creative exercise of the attributes and abilities attained in adolescence.

Psychological maturation depends on appropriate sequential opportunities for cognitive and social stimulation. Biological maturation can assist it by, for example, providing the muscular strength and dexterity to permit the adolescent to participate successfully in the activities of his group and thus increase his feelings of competence and self-esteem. Similarly, an adolescent's positive psychological motivation leads him to perseverance and to a search for a variety of experiences—both of which contribute to his muscular development through exercise.

A major attainment during the adolescent period is the development of conceptual thought at an abstract level. This is basic to the development of scientific thought and creativity. The evolution of these intellectual functions requires appropriate environmental stimulation, and their ultimate degree will be determined largely by the care with which society fosters them.

A second and related characteristic is the adolescent's search for a sense of personal identity. Now no longer a child and not yet an adult, the adolescent is busy determining his values, beliefs, his future and his role in society. In the course of doing this, he tends to examine more critically his parents and other persons who traditionally have authority over him, and he may temporarily seek support and advice from his contemporaries and from adults outside his family. If his relations with his parents have been soundly constructed during earlier years and if his present doubts and questions are met with sympathetic understanding, a gradual resynthesis of his relations with his parents into a new, firm and lasting basis can be expected. However, if the child-parent relationship has been marked by expressive dependence or by hostility, the adjustment during adolescence may be prolonged or may lead either to the adolescent's failure to gain independence of thought and action, or to his rejection of family ties and to a lasting sense of isolation from his family.

The strengthening of the adolescent's self-esteem, which is so important to his development, is favourably influenced by constructive social groups. If these provide creative outlets for his energy, the likely result is his constructive membership in his community. On the other hand, if his group is a delinquent gang with values directly antagonistic to those of the larger social order, he is likely to exhibit antisocial attitudes and behaviour.

It cannot be too strongly emphasized that the psychological basis for a sense of individual worth as an adult rests upon the acquisition of competence during adolescence. Furthermore, those who acquired some self-esteem through meaningful successes and through recognition in childhood are apt to find the developmental processes of their adolescent years less difficult. The Committee strongly recommends efforts to provide such opportunities for children aged up to twelve years.

A third development centres on the adolescent's acquisition of appropriate sexual attitudes and behaviour. These have their roots in childhood, but, when the adolescent becomes conscious of his changing body and its adult sexual characteristics and of a bewildering array of new physical sensations, he experiences an upsurge of interest in sex and has new thoughts about interpersonal relationships. Forces in his present environment then combine to react with the products of his past to determine the nature of the sexual adaptation he will make.

There is great need for those concerned with adolescents to make clear to them that mature sexual behaviour is based on mutually meaningful relationships between human beings. This concept is of first importance, but adolescents also require knowledge of the physical and physiological attributes of each sex, and they need opportunities to ask about and to discuss the sexual matters that they may hear about or experience as they mature. The fear that giving them information will lead them into premature sexual experimentation appears to be unjustified; ignorance is much more likely to cause sexual misadventures.

These three dynamic processes that characterize the psychological development of the adolescent—the development of conceptual thought at an abstract level, the search for identity, and the maturation of sexual attitudes—are accompanied by a rich fantasy life and may be associated with moods, attitudes and behaviour, which, although neither always acceptable nor by any means universal in adolescents, can be regarded as normal. The adolescent vacillates; his moods alternate between depression and elation, his desire for solitude co-exists with a need for group activities, his selfishness with altruism and his conformism with rebellion. Much that he says and does, provided there is promise of change, requires more patience than action from the adult interested in his welfare.

The inadequacy of data regarding certain aspects of emotional, mental and character development is apparent. The difficulties of measurement and methodology in this field are well recognized, but techniques for measuring the various aspects of intellectual performance and social adaptation are steadily accumulating. A multidisciplinary approach is essential. It is important that data on intellectual and affective development, on character maturity and on social competence should be correlated with anatomical and physiological measurements.

For many years, scientific data of a multidisciplinary character have been available showing the extent to which the adolescent is capable of adaptation, even when dissocial attitudes are strongly apparent. These findings provide valuable pointers to the understanding of normal development. The work, carried out in different fields, has been brought together and applied in mental hygiene. The results of such research and its mental-health implications should be carefully studied and taken into account by all those who are concerned with adolescents.

2.3 Variations in the course of normal growth

Many very common problems of otherwise healthy adolescents are related to the vagaries of one or another of their normal growth processes. Adolescents are in a state of transition: their physiological and psychological processes are not static. It is important that this aspect should be taken into account by the physician who treats the disorders.

It should also be remembered that disorders such as those commented on in this section occur at a time when adolescents are very vulnerable, and the somatic aspects of the disorders cannot be evaluated separately from the emotional and social elements, which are often a considerable part of the total problem. It is for these reasons that a few illustrative disorders are mentioned here.

Growth disturbances

Delay in sexual maturation, short stature in both sexes and potentially excessive height in girls each raise questions about the normality of an adolescent's growth. Although such factors as a concurrent illness, malnutrition, and endocrine and emotional disorders need to be considered, many otherwise perfectly healthy young people will be found to display wide variations from the average pattern of growth. Most of these represent a delay rather than a defect in the growth process and require only reassurance and an explanation that there are many different ways of growing, all of which are quite normal. However, adolescents tend to worry about their bodies, and for reassurances to be effective they may need to be repeated and they should never be casual. Adolescents whose prospects of normal development are less certain will need continued support and assistance in finding activities which, though not dependent on size or sexual maturity, can yet yield them recognition and acceptance. The development of a variety of hormone preparations has at times led to their extensive use before their side and long-term effects have been fully realized. Indiscriminate use of these preparations must be avoided with all age-groups. Certainly during childhood and adolescence their use should be confined to those products on which research and careful and expert clinical studies have been carried out. These preparations include not only the sex hormones but also anabolic agents and cortico-steroids. The use of oral contraceptive preparations by growing adolescents seems highly undesirable.

Breast changes

Breast changes begin in early adolescence, when oestrogen levels rise rapidly. They seem to represent an innate end-organ response to this hormone.

Simple gynaecomastia in boys requires no treatment except the reassurance of those adolescents whose heightened concern about their bodies and doubts about their masculinity may cause them excessive anxiety. More pronounced gynaecomastia in boys and mammoplasia or grossly asymmetrical breast development in girls are more apt to interfere with their acceptance in certain cultures and therefore also with their normal personality development. These adolescents will require at least a physician's explanation, reassurance and support, and some may require surgery.

Metropathia

Excessive menstrual flow is not uncommon in adolescents, and in younger girls it is likely to be acyclic. When it occurs it causes fatigue and also considerable anxiety. Although girls who suffer from metropathia have had their menarche, their ovarian-pituitary function may not yet permit ovulation and a mature type of cycle.

In view of the importance of a girl's attitude towards later assuming an adult feminine role, and because it is likely that her production of progesterone is low, recognition both of her feelings and also of the probable physiological basis of her complaint is essential. For the same reasons, prompt appropriate therapy is preferable to extensive examinations.

Older adolescents, whose excessive flows are more likely to be cyclic, and the younger ones who do not respond quickly to treatment will require further study.

Acne

Prior to the onset of the rapid increase in androgens, the sebaceous glands are small and relatively inactive, and acne is non-existent. As androgen levels rise, the sebaceous glands enlarge, their output increases rapidly, and acne—which may scar both the skin and the personality—may appear. Multiple predisposing and contributory factors need to be considered, but the physician's explanation to his patient of the growth phenomena that are essential to the development of acne, his friendly attitude towards him and his understanding of the seriousness with which young people regard this condition are major aspects of its treatment.

Slipped capital femoral epiphysis

This condition occurs as the gradually changing alignment of the femoral epiphyseal plate nears a 120° neck-shaft angle. If a young adolescent is obese, the shearing force on this plate is increased. Should such an adolescent be given a "reducing" diet deficient in the calcium, protein and vitamin D that his rapid growth requires, his epiphysis may be rendered even more vulnerable.

Although the etiology of this condition is not completely understood, it is clearly wise to remember the changing epiphyseal-plate relationships during adolescence and also the need to control an adolescent's excessive fat without depriving him of his growth's dietary requirements. In addition, should long-term bed-rest and traction prove necessary, counter-measures to offset their possible effects on personality development through loss of the usual opportunities for success and recognition should also be given attention.

Avulsion of the tibial tubercle (Osgood-Schlatter disease)

This condition may develop when the young adolescent's habit of strenuous activity combines with rapid growth and with the concurrent shift (distally) of the insertion of the ligamentum patellae. The condition usually responds promptly to simple measures, but when a long period of rest and restriction is necessary, physicians should consider the effects of such treatment on the adolescent's opportunities to achieve success and recognition.

3. HEALTH NEEDS

The health needs of adolescents are chiefly in the areas of nutrition, physical and mental fitness, occupational and school hygiene, and health education.

3.1 Nutrition

Children of less than five who suffer primary severe undernutrition go through successive periods of losing their body stores, alterations in the biochemical composition of their tissues and the weakening of their defences against disease. Those who survive may not regain their initial physical and mental potential, and they may go through adolescence under a severe handicap. Good nutrition in childhood is clearly the basis of satisfactory nutritional health in adolescence.

Adolescents' nutritional requirements are considerably greater than those of children because of the strenuous nature of their work and activities and because of their rapid growth. These nutritional needs will vary between the sexes, at different periods of adolescence and under varying conditions of activity, constitutional type, and climate.

Wherever food is less readily obtainable, undernutrition presents a serious threat to health, particularly during pregnancy or exposure to tuberculosis. The health hazard arising from undernutrition will be increased by such conditions as poor sanitation, widespread infections, parasitic infestations, and heavy work.

In countries where obesity is not uncommon, health education, directed particularly at girls, may help to minimize the effects of ill-planned dieting, which can result in undernutrition.

Educational programmes for physicians, nurses, public health workers, teachers and the community at large should emphasize the nutritional needs of adolescents. Since a substantial proportion of adolescents can be reached in residential institutions, boarding schools, the armed forces, and industry, it is recommended that in each of these organizations emphasis be given to the provision of adequate diets and nutrition-education programmes.

3.2 Physical fitness

Since many adolescents, in their efforts to gain success and recognition, tend to tackle their work and their recreational activities in a very strenuous manner, and because they have not yet acquired the skill that permits the adult to do many of the same tasks with a much lower expenditure of energy, it is imperative that their fitness to withstand stress should be fostered. Unless this is done, it may be necessary to restrain them from activities that may furnish them with a livelihood or at least contribute to their confidence and self-esteem. Consequently, determined efforts should be made to increase their capacity to perform strenuous activity without excessive strain or fatigue and to include in medical examinations a means of estimating their response to stressful exertion and not just their soundness at rest.

Fitness to perform and to recover from strenuous physical exertion depends on a variety of factors. Among them are ecological and anthropometric ones, constitutional inheritance, strength, agility, skill, psychological make-up, and the efficiency with which the heart, lungs, blood and muscles carry out their functions during exercise.

Although all these factors should be considered when physical fitness is being evaluated, or when efforts are being made to improve it, the physician's special interest is the responses of the cardiovascular and pulmonary systems to exertion. Knowledge only of the size of an adolescent's heart or its sound at rest or its rate after brief, mild exertion (such as hopping 50 times) will not allow of a valid opinion of the quality of that adolescent's response to the sort of strenuous activity that he may wish to engage in. What is required for such an evaluation is one of the various techniques that take account of changes in, for example, heart rate, blood pressure, respiratory rate, oxygen intake and blood lactic-acid level during and after strenuous exertion. Such information enables the physician to estimate the quality of the response of the heart, lungs and muscles to stress. Subsequent examinations of the same kind enable him to determine the suitability and benefits of that adolescent's work or exercise programme.

The individual's capacity to carry out and to recover quickly from physical stress is improved by a programme of regular, consistent and appropriate exercise. Not only will a good conditioning programme decrease the possibility that strenuous exertion will cause an adolescent excessive strain or fatigue, but it will also make it possible for him to carry on his many less-demanding daily tasks with comparatively little fatigue. Besides making the individual feel more alert and zestful, regular physical activity is a major factor in preventing possible adolescent obesity.

A daily school exercise programme would seem to be desirable, at least in those countries where young people do little physical work. Its

aims should be to improve the functional efficiency of the heart, lungs and muscles during exercise, to increase strength, flexibility and skill, and to develop a liking for exercise that will ensure its continuation in adult life.

The hazards of fatigue and its effects on performance in school, in employment, and during recreational activity cannot be overemphasized, and the detection of its causes and its prevention are of great importance. Adequate rest is an essential at all ages, but those who are concerned with the maintenance and improvement of the health of adolescents must give the major share of their attention to improving these young people's physiological efficiency through exercise, so that they may subsequently engage in strenuous activity without danger of strain or excessive fatigue.

3.3 Mental fitness

Other sections have clearly indicated the great importance of the adolescent's mental health. For this reason it is necessary here only to emphasize the major roles played by heredity and constitutional factors, by parental attitudes during the adolescent's antenatal, infancy and childhood periods, by his childhood experiences at home and on entering school, by the degree of acceptance and success that he achieves, and by the quality of extra-familial influences during his early years (prior to the age of 12)—all these factors are important in determining the quality of the adolescent's adjustment.

An adolescent's mental fitness can be evaluated on the basis of his success in acquiring satisfactory attitudes towards authority, his understanding of himself, his state of psychosexual development, the degree of his interest in others, and the quality of his values and goals. These attitudes are most apt to be satisfactory when the adolescent has had sufficient time to think and to make choices, when he has had some successes, acceptance and approval, and when he has had opportunities to deal with challenging experiences and reasonable amounts of struggle and anxiety.

The historical context of an individual's life, both cultural and personal, has inescapable significance for his emotional future. Studies of family and environmental disturbances have produced suggestions for preventive measures. Further studies of this kind and of such factors as social mobility and migration should be carried out. The increasing emphasis on academic and technical achievement and its attendant pressures on the adolescent who has limited cognitive ability present still another problem that requires study, and this may perhaps be effected by observing the methods used by normal adolescents to meet such challenges.

The Expert Committee strongly recommend that WHO devote further attention to the mental health problems and needs of adolescents.

3.4 Health education

Adolescents must eventually assume adult responsibilities, among which is responsibility for their own health and the health of other people.

An adolescent's health education should not be thought of as something isolated from his past. It starts in childhood with the example set by his parents with regard to their own health practices.

Health education today still tends to have moral connotations and overtones of authoritarianism that may cause the adolescent to disregard it. It would be more effective if there were better training of health personnel and schoolteachers, and if priority were given to those topics that are of present concern to adolescents and are suited to their cultural setting. Its content should emphasize hazards such as smoking, excessive drinking of alcohol, the abuse of drugs, and the prevention of accidents. In sex education there should be less emphasis on the biology of reproduction and more opportunities for the discussion of adolescents' questions concerning behaviour and ethics. Preparation for parenthood and family life are generally regarded as important areas in health education.

To help meet the needs of adolescents (particularly those not at school), authoritative literature and pamphlets should be made available through youth clubs, the Boy Scout movement, the Red Cross, military services and other groups. Literature designed to augment the knowledge of teachers and other health workers and opportunities for them to discuss health-education matters in seminars would be very useful.

In an effort to assist employed adolescents, health personnel may wish to consider furnishing educational material to trade unions and taking any other steps that would foster the unions' understanding of the value of health education for adolescents.

3.5 Health and employment

Although adolescent workers in the more developed and more affluent countries are not without problems, the major health problems of adolescent workers are to be found in the developing countries. It is there that a very high percentage of the world's 300 million 15-19-year-old adolescents live, and it is there, too, that poverty, illiteracy, undernutrition and disease are most prevalent and form a vicious circle. Millions of adolescents in those countries are at work before the age of fourteen, and many indeed from a very early age.

In many developing countries, children and adolescents often work long hours, and the conditions under which they work are subject to little control. Many are physically underdeveloped, not yet accustomed to the energy-sparing work rhythm of the experienced worker, exposed to many health and safety hazards, and comparatively lacking in health care.

Health standards therefore need to be set, safety measures enforced, and labour leaders, employers and supervisors educated in the ways of protecting the health and safety of adolescents. More attention should be given to proper food and recreation facilities.

Above all, special efforts are needed to abolish the causes of the utilization of child labour. Moreover, taking account of all the environmental factors unfavourable to personality development, there is a clear need to increase the fitness of adolescents for employment and to increase the number of opportunities for productive work. Without these, there can be little prospect of improvement in the health, behaviour or self-esteem of many adolescents.

One of the adolescent worker's greatest needs is enlightened vocational guidance by trained personnel, which takes into account his characteristics, the sort of world in which he is going to live, and the available jobs. As part of such guidance, the adolescent requires pre-employment and follow-up medical examinations that focus on his suitability for the work involved. If these are to be effective, realistic standards must be developed and enforced, and present staffs of qualified medical personnel and of industrial nurses, psychologists and labour inspectors who are knowledgeable about adolescents and interested in them will need to be increased.

The International Labour Organisation have been deeply concerned with the development of principles and standards relating to the employment and health protection of young people. It has adopted a series of international instruments regulating such important conditions as the minimum age for entry into employment, medical examination for fitness for employment in dangerous occupations, night work, rest periods and holidays, and the organization of occupational health and labour inspection services.

The Committee expressed interest in and satisfaction with the work being done by the ILO to protect the health of children and young workers and the hope that this work could be intensified in close co-operation with WHO.

3.6 Health and the school

At present the majority of adolescents in the world have little or no opportunity for post-primary schooling. However, the growing demand, both in industrialized and in developing countries, for a diversity of qualified manpower requires that more young people continue their education.

As this happens it becomes necessary to improve school health programmes. These are clearly in the best interests both of the adolescent and of society because the family and community sacrifice much to achieve the advantages of post-primary education. It would be a short-sighted

policy to furnish adolescents with good education (whether secondary, technical or agricultural) and not try at the same time to correct impaired sight or hearing and to improve the general state of health and nutrition.

The Committee recommend that WHO, in close co-operation with the United Nations Educational, Scientific and Cultural Organization, should explore ways and means of effectively contributing to the establishment, development and improvement of school health services for adolescents.

4. HEALTH PROBLEMS

The number and severity of adolescent health problems vary somewhat from country to country, but in each there is a continuing need for the collection of data concerning the incidence of adolescent disorders, for research into the etiology and treatment of their diseases and for the improved education of all who are concerned with their health. A few disorders have been selected for mention here because they illustrate the fact that many disorders have special features when they occur during adolescence, but many other disorders could be listed that would fulfil this purpose equally well.

Tuberculosis

The incidence of tuberculosis has sharply diminished in some countries, but in others it is still high. The rapid lowering has depended on better living conditions, including nutrition, and on the use of chemotherapy and BCG vaccine. In some developing countries in which the disease is still rife, there is difficulty, because of unfavourable social conditions and the shortage of medical and health personnel, in applying appropriate preventive and therapeutic procedures.

The disease has special pathological characteristics during adolescence. When tuberculin conversion occurs it is more likely to be rapidly progressive, and young adolescents are very susceptible.

Primary infections of late childhood and early adolescence account for most of pulmonary tuberculosis in adolescents, and so the reduction in its incidence by chemotherapy depends on the effectiveness of case-finding in those who are ten years or more of age. Tuberculin-testing programmes should be followed by prompt radiography and clinical diagnostic procedures for those who have become positive reactors and then by prompt and appropriate treatment.

Radiography is necessary for diagnosis in individual patients, but is not now so commonly employed in the screening of large populations because of the irradiation hazard and the expense. Microfilm examination is employed in some circumstances in mass surveys.

In areas where tuberculosis is now uncommon, there is a risk of delayed diagnosis for the adolescent. Physicians may not be sufficiently aware nowadays of the hazards of this disease to adolescents, and they may need to be warned from time to time.

Menstrual disorders

In evaluating and treating delayed menarche, the physician should recognize the need for reassurance of both parents and daughters. With cases of primary dysmenorrhoea, he should remember the psychological and environmental components of this disorder and, with cases of amenorrhoea, that a young girl's underlying anxieties may be a causative factor. He needs to be mindful of every adolescent girl's changing physiology (hormonal relationships, iron needs, etc.) and feelings. There are few, if any, fields in which it is more important that the physician should understand his patient as a total person.

Incapacitating primary dysmenorrhoea is a common complaint in some societies. Cross-cultural research might yield data on its varying incidence and uncover clues that may help to determine the causative factors.

Venereal diseases

Venereal diseases, unlike tuberculosis and menstrual problems, show no special peculiarities during adolescence, but their incidence among adolescents is high and is apparently increasing at a greater rate for this age-group than for any other.

Among the suggested methods of control are the instruction of parents in the proper rearing of children, so as to improve the development of the future adolescent's personality; the health education of children themselves, so that good attitudes towards sex are developed at an early age; the stimulation of interest and alertness among health workers to the prevalence of venereal disease in adolescents; and the improvement of present epidemiological methods.

Accidents

The prevention of accidents deserves very high priority, and the short space allotted here should not suggest that the Committee minimize its great importance.

In some countries, half the deaths in the 15-20-years age-group are caused by accidents. Many more boys are injured than girls. Accidents occur to adolescents most frequently on the roads and in industry. Sports such as football and boxing also claim their victims. The high incidence of deaths by drowning suggests the need to teach both swimming and methods of prevention of water accidents to adolescents as well as to children.

Preventive programmes against accidents to young workers in industry and agriculture are especially important, particularly for the adolescent employed in the new industries.

More research is required into the causes of accidents to adolescents : this might reveal facts that could aid preventive efforts.

Thyroid disorders

Endemic goitre constitutes a considerable health problem in many countries, where the disease has a high prevalence in all age-groups. The use of iodized salt and other public health measures should be emphasized.

Adolescent goitre apparently represents a physiological response to the excessive need for thyroid hormone caused by the adolescent growth spurt. This type of enlargement can be expected to regress spontaneously. It should be carefully observed and is not to be confused with other causes of thyroid enlargement.

Hypothyroidism, if unrecognized or inadequately treated in childhood, will manifest itself by continued growth retardation in adolescence. Its favourable response to safe, simple, inexpensive treatment makes its recognition imperative.

Diabetes

Diabetes in adolescents differs from that in adults in that it develops rapidly, tends to be complete and behaves in a very labile fashion. Furthermore, when an adolescent has diabetes (developed either recently or in childhood), careful consideration must be given to his increased nutritional needs for growth and activity and to such psychological factors as his resentment of restrictions and of being different from others.

There is general, but not unanimous, agreement that thorough control and careful, but not rigid, dietetic management are important elements in preventing the very serious sequelae of the disease. Adolescents whose disease is well controlled and therefore brings them few symptoms may be less apt to become anxious or to develop personality difficulties.

Dental caries

It is generally believed that during adolescence there is an increase in the amount of dental caries. However, whether such an increased incidence is due to the adolescent's physiological status or to his health practices, or whether indeed it exists at all, is more difficult to determine than is widely recognized. Factors to consider are that the number of teeth and the number of vulnerable tooth surfaces "at risk" are greater in the adolescent than in the child and that his teeth have been exposed to hazards for a greater period of time. Regardless of the complexities of assessing basic

relationships between age and dental findings, it is a fact that the caries' attack rate for groups of adolescents (it is worth remembering that there is a wide variation between individuals) rises sharply after all the deciduous teeth have been lost and the permanent ones are in position.

Fluoridation of water, good dental care and good dental health education in childhood seem to be major factors in controlling caries rates. However, these measures must be followed by regular dental care during adolescence. In one country, dental care was at first provided for all children up to the age of thirteen, and, when the service was eventually extended to cover young adolescents up to the age of sixteen, the number of requests for dentures fell, within a few years, by 50%.

Undescended testes

Undescended testes will usually be detected before puberty, and if surgical correction is necessary the operation should take place, if possible, before adolescence. If deferred, infertility may result. Adolescents in whom the condition is bilateral are likely to be sterile if not operated on; in others, sterility may follow if injury or disease occurs in the normal testis.

When surgery is required during adolescence, a preliminary, reassuring explanation is highly desirable. Adolescents are prone to worry about their bodies and particularly about the sexual organs.

Pregnancy in early adolescence

It appears that the number of pregnancies occurring in early adolescence is increasing. There is evidence that the infants born of these pregnancies tend to have low birth weights and are subject to neglect and unfavourable feelings from immature mothers. The many compelling physiological, psychological and social components of this matter prompt the recommendation that it should receive increased attention and study.

Epilepsy

As the central nervous system matures during adolescence, there are concurrent, progressive changes in the character and severity of epileptic seizures. Petit mal attacks tend to diminish; but the years from 10 to 20 usher in both the more devastating generalized convulsions and a high frequency of the distressing psychomotor disorders.

The greater severity of seizures at this time of life may be due in part to psychological factors; the central nervous system is certainly under increasing stress during those years. In any event, the reduction of an adolescent's anxieties and conflicts usually results both in a decrease in the severity of his seizures and also in a decrease in the amount of anticonvul-

sant medication he requires. The hormonal changes of adolescence may also contribute to the higher frequency of seizures and to the alteration in their pattern that are seen at this time. These changes are believed to alter the sensitivity of the neurones. In any event, epilepsy in an adolescent certainly needs to be thought of in a different biochemical and psychological context from that in the child or the adult.

Psychological repercussions due to limited acceptance by their contemporaries, to restraints on their need to acquire increasing independence, to the imminence of job and marriage, and to exclusion from strenuous activities all need to be taken into account in the total management of the adolescent epileptic. The deleterious effect that large doses of drugs may have on the adolescent's capacity to learn in school, society's rejection, and mental retardation are other very important aspects that merit attention.

Adequate facilities for the treatment of adolescent epileptics should be provided. With good management, a remarkable proportion of them can expect near-normal development — a fact that cannot be too frequently repeated.

Efforts to reduce the resentment that epileptic adolescents may feel and assistance in such matters as employment and marriage are no small part of their treatment. Continued efforts should be made to change the attitude of communities towards epilepsy and to achieve an easier integration into the working community of those who suffer from this disease.

Mental and physical handicaps

Extensive solicitude is shown in most countries to a handicapped child, but when the child becomes an adolescent, the assistance given to him is often considerably less. Yet it is then that all the matters that can disturb an adolescent without a handicap may be even more stressful for a handicapped one. For the latter, questions about his future employment and marriage can be fraught with difficulties. All of them—the blind, the deaf, the mentally retarded, and those handicapped in many other ways—need much more help than is now usually available to them in adolescence.

The Committee recommend that WHO devote further attention to the organizational problems of caring for physically handicapped and mentally retarded adolescents. These services should be directed at helping them to achieve as useful and satisfying a place in the community as their capacities permit.

Those who are blind or who have severe myopia or amblyopia should be taught a trade in which there is likely to be satisfying employment and in which any vision that they may have is maximally used. Those whose distant vision is minimal may pursue more satisfying and more productive lives when furnished with the recently developed telescopic lenses.

Many children reach adolescence with amblyopia still undiagnosed. Since amblyopia is not correctable after the age of six, screening programmes for visual defects should be conducted in the pre-school years. Such examinations in childhood do not make the vision examination of the adolescent unnecessary. The incidence of myopia increases as the maturation processes of adolescence proceed.

Hearing defects likewise should be discovered in early childhood, but audiometric examinations are also necessary for the adolescent, particularly in pre-employment medical examinations.

Some groups of adolescents who have had limited earlier stimulation have been found to have perceptual disorders that incapacitate them for work in industries requiring such skills as good three-dimensional perception. This fact has implications for preventive measures and also for vocational guidance. Disorders of sensory perception often underlie disturbed behaviour. Moreover, a lowering of intellectual efficiency and school performance can be a consequence of such disorders.

Other mental health problems

Many of the more frequent but none-the-less significant psychological difficulties of adolescents (rebellion, identity crises, temporary sexual difficulties, anxiety states and minor depressions) are outgrowths of the normal emotional processes characteristic of this period of life—the quests for independence, identity and a mature psychosexuality. Some of these difficulties may resemble the psychiatric disorders of adults, but they need to be thought about and managed in a very different manner.

Internal and external stimulation can overwhelm inhibitory control systems. During adolescence, the individual usually experiences, mentally and affectively, periods of dissociation, strange feelings, perplexity, bewilderment, panic reactions and even confusion without a psychotic outcome. It would seem undesirable to place a diagnostic label on these temporary states. For most adolescents who are emotionally upset, short-term treatment followed by observation, while waiting for the adolescent's normal processes to mature, would seem most appropriate.

The sort of help that adolescents usually require is the opportunity to experience a relationship with a trusted adult, to put their feelings into words, to talk instead of being talked at (when their feelings or culture allow this), to have temporary support coupled with a fostering of their independence, to be given a constructive outlook, to have help in the manipulation of inimical factors in their environment and to be given positive advice when they appear willing and able to accept it. Where the influence of the family is inadequate, or if the adolescent is trying to break his close ties with home, the trusted adult to whom he can talk freely or from whom he can accept advice may be someone outside his family. Physicians, schoolteachers, school and occupational health nurses, and

social workers should all be willing, ready and trained to listen to him sympathetically while he talks of his ambitions, his difficulties, his sexual problems or his failures.

The physician, whether he is a family doctor, a school doctor, an industrial doctor or a clinic doctor, is in a position to play an important role in all these aspects of adolescent development. This requires of him that he should be ready to consult not only with the adolescent but also with teachers, nurses, social workers and others in the areas of health education and mental hygiene who may seek his advice and who, in turn, may be sought out by adolescents.

Adolescents are also subject to more severe emotional disorders such as contemplated suicide, schizophrenia, depression and sexual deviations. These actual mental illnesses should be distinguished from the minor temporary disorders that they sometimes resemble.

Suicide is rare in children, but its rate rises as adolescence begins. In most countries the rate is considerably higher among males. However, a much more common and very important problem in preventive medicine is attempted suicide. More instruction of health personnel about this serious matter is needed. It is better regarded as a cry for help than as an annoying endeavour to gain attention, as some physicians still regard it.

Depression, failure and loneliness appear to be important factors when adolescents commit suicide. Impressions gained from mass media may also be, at times, a contributing factor and may sometimes result in adolescents imitating what they see or read.

Special attention is called to the emotional and social problems of the adolescent in a rapidly changing society. In some traditional societies, children are treated in a kind, permissive manner, but at the same time they are held to certain rigid rules and social conformity. As already mentioned, they experience puberty rites that tend to confer a strong group identity. Furthermore, they are usually early given satisfying jobs and responsibility, which bring them automatically and abruptly in early adolescence to full integration into the world of adults. In these circumstances there may be little need for them to rebel. Their whole social structure is community-orientated with deep group commitments, and there is a similarity of standards, prospects and behaviour.

Adolescents who live in a transitional society face very different conditions. Here many changes are taking place. There is rapid growth in population and urbanization; tribal families are splitting into smaller groups; there is cultural conflict and the transfer of certain functions from the family to community agencies; job-getting is becoming more and more dependent on education; and the adolescent's amount of free time is considerable.

In industrialized societies, too, the rapid rate of social change exposes many adolescents to stressful new demands as they move from rural to

urban environments, from one social class to another, from one educational and occupational setting to another. Such problems as identity crises, role diffusion and isolation may develop more easily in these conditions.

An adolescent would seem more likely to experience difficulty in meeting his normal emotional processes when he lives in a society that hurries him into making decisions, that is complex and excessively competitive, that offers a multitude of choices, beliefs, values and careers, and in which the standards and practices of behaviour are confusing rather than clearly defined.

Psychosomatic disorders

Adolescents, as their bodies and personalities mature, are influenced not only by new psychological and social factors, but are also constantly reacting to the regulatory processes of their bodies (their internal milieu) that throughout their lives have been attempting to maintain homeostasis. In attempting to understand the genesis of psychosomatic disorders, it is important to consider those processes and also the effect that a cluster of stressful circumstances, perhaps no one of which acting alone would constitute a hazard, may produce in a biologically or psychologically predisposed individual. These matters have been discussed by the WHO Expert Committee on Mental Health.¹

Since our knowledge of the pathogenesis of psychosomatic disorders (e.g., anorexia and certain headaches) is meagre, it seems wise to regard and treat them as being the result of stressful circumstances impinging upon a particular type of internal milieu. They will perhaps best be understood and successfully treated by the physician who can and will take all these factors into account.

Everyday problems

Finally, it should be re-emphasized that, while some adolescents will at times display serious emotional disturbances, the vast proportion of young people who have emotional difficulties straighten them out by themselves or require only a little help. These difficulties are the transient phenomena of growing up; their understanding and calm handling by all health workers are necessary if they are not to be given either too much or too casual attention.

As more efficient diagnostic criteria are developed, serious problems will be detected with greater confidence, but the major requirement is the training of all physicians in the recognition and handling of these near-to-normal, everyday problems. It would also be helpful if psychiatrists who

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1964, 275.

have experience in this field were to participate to a greater extent in the clinical supervision and training of other health workers, so that they, in turn, could more effectively help those adolescents who need some assistance.

In all the difficulties the adolescent brings to his physician, the inter-relationship of the physiological, physical and psychological facts of adolescence needs careful consideration. This, and the tendency of most adolescents to respond well to those adults who show an interest in them, should be given emphasis in the training of doctors and nurses and the auxiliary health workers who work with them.

5. HEALTH SERVICES

School, university and industrial health services represent a major segment of the health care that is offered to adolescents. The student health and guidance services that exist in certain countries are an example of the means of providing adolescents with vocational and psychological counselling, in addition to health protection and promotion. This multi-disciplinary type of activity could beneficially be used within employment settings to improve the health of young workers.

Where health services are sufficiently developed, there usually exist services geared to deal specifically with the health problems of adolescence, to train staff and to carry out research. These services include such specialists as orthopaedists, gynaecologists, endocrinologists and psychiatrists. The co-operation of representatives of other disciplines, such as psychologists and sociologists, is an additional asset.

In all circumstances, however, more consideration should be given to the health problems of adolescents in general health services. This presupposes the adequate training of health workers at all levels.

It is most important that health workers who deal with adolescents should co-operate with social agencies, vocational-guidance centres, youth organizations, sports clubs, etc. and stimulate their interest in the protection and promotion of the health of adolescents.

Adolescents should have at their disposal health workers and other competent persons capable of dealing with their characteristics and health needs. These needs have been defined as the temporary difficulties that develop out of their normal growth processes, the diseases from which they suffer, and their interrelated mental, emotional and social difficulties.

To this end, it is desirable that all physicians and health workers should have increased opportunities to learn about the physiological, mental, emotional and sociological aspects of adolescence and its disorders. Medical

and nursing schools and other training institutions for health personnel should offer more and better instruction about adolescents than is the case at present.

6. RECOMMENDATIONS FOR RESEARCH

Although much pioneer work has been done recently, the Committee were concerned about the widespread lack of knowledge of different aspects of adolescence. In many countries even basic information is scanty or non-existent.

It is imperative that research be undertaken in different parts of the world on the biological, physiological, biochemical, psychological and social aspects of adolescence. The psychosocial implications should be given due consideration in all studies. Medical, epidemiological and sociological studies of the adolescent in his ecological context, such as his culture, family, school and occupational setting, should be encouraged.

Wherever possible, studies that could give relevant information in the shortest time should be encouraged, since rapidly changing conditions and this age-group's increasing numbers make speed desirable. However, due consideration should be given to the long-term effects of any recommendation based on these studies.

In planning research, full advantage should be taken of previous experience gained in related fields and of co-operation with appropriate institutions and national agencies. Research on adolescence would gain much in theoretical and practical value through the planning of co-ordinated studies in different parts of the world. WHO and other specialized agencies have a significant role to play in promoting and assisting international, comparative and regional studies.

The Committee considered the following subjects to merit priority in research :

(1) The growth and development patterns of healthy children and adolescents in various parts of the world.

(2) Multidisciplinary studies of intellectual, emotional and character development correlated with anatomical and physiological measurements.

(3) Standardization of the methods of assessing growth and development, including criteria for the making and analysing of measurements, in order to allow cross-cultural studies to be made.

(4) The epidemiology of variations in the course of normal growth, such as growth disturbances, metropathia, acne and slipped femoral epiphysis.

(5) Nutritional requirements during adolescence in various countries and cultures.

(6) Morbidity and mortality data for various countries at each of the ages of adolescence (10-20 years).

(7) The causes of accidents and methods of preventing them.

(8) The effects of social mobility and of migration on adolescents and the means of combating those that are deleterious.

(9) The hazards of very early pregnancy.
