HEALTH NEEDS OF SOCIETY:
A CHALLENGE FOR
MEDICAL EDUCATION

10th CIOMS Round Table Conference
and
Scientific Session of the 10th General
Assembly of CIOMS

SOCIÉTÉ ET SANTÉ:
L'ENSEIGNEMENT MÉDICAL
FACE A UN DÉFI

10e table ronde du CIOMS
et
Session scientifique de la 10e Assamée
générale du CIOMS

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10th CIOMS Round Table Conference
Ulm, Federal Republic of Germany, 6-10 July 1976

and

Scientific Session of the 10th General Assembly of CIOMS
Geneva, 10 November 1976

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The Council of International Organizations of Medical Sciences (CIOMS) is a non-governmental organization established by the World Health Organization and the United Nations Educational Scientific and Cultural Organization in 1948. Its membership includes sixty-six international organizations, representative of the basic medical sciences and clinical disciplines, and twenty-three national members representing academies of science or medicine and national research councils of their countries.

CIOMS was initially created by the United Nations agencies to reestablish communication among medical scientists and practitioners of medicine throughout the world. While still maintaining the initial purpose in the form of an annual calendar of international and regional biomedical meetings, CIOMS has expanded its activities in diverse areas. The activity of facilitating international communication has been augmented by the development of an international nomenclature of diseases. This, when completed, will reduce confusion and errors in the analysis of data on diseases reported from various parts of the world by providing the preferred name for a disease as well as a number of synonyms in common usage.

In the past decade CIOMS has brought the attention of the international biomedical community to ethical issues raised by advances in biology and medicine. This has been achieved through a number of round table conferences at which representatives of medical and non-medical disciplines from many parts of the world joined to consider timely and often sensitive and controversial issues. The proceedings of these round table conferences have been published and the subjects include the following:

- Biomedical Science and the Dilemma of Human Experimentation (Paris, October 1967)
- Heart Transplantation (Geneva, June 1968)
- Medical Research - Priorities and Responsibilities (Geneva, October 1969)
- Training of Research Workers in the Medical Sciences (Geneva, September 1970)
- Drug Abuse: The Non-Medical Use of Dependence-Producing Drugs (Geneva, October 1971)
- Recent Progress in Biology and Medicine: Its Ethical and Social Implications (Paris, September 1972)
Protection of Human Rights in the Light of Scientific and Technological Progress in Biology and Medicine (Geneva, November 1973)

Medical Care and Society (Rio de Janeiro, August 1974)

The round table conferences, which have become a hallmark of CIOMS, have also identified the Council as one of the major organizations considering the social and ethical aspects of medicine and scientific research. CIOMS is presently developing a long-term, multi-facet programme to examine the ethical implications of scientific progress. The international and national membership of CIOMS includes representatives of many medical schools in the world. Those representing the international unions and federations of medical sciences as members of CIOMS are also usually distinguished teachers of future generations of physicians. In addition, the scope of research interest of CIOMS embraces aspects of research in all areas of health manpower development. Small wonder, therefore, that medical education has been a matter of concern to CIOMS. In the first quarter century after the Second World War, the emphasis in medical education was on the incorporation of the explosive growth of biomedical knowledge into the medical curriculum. In the last ten years there has been a rising concern about medical education becoming too far removed from social needs for health in many countries. In recognition that this is an important issue which must be considered by the international health community and by national medical and science policy bodies, CIOMS organized the international round table conference, whose proceedings follow, to examine the potential contributions and limitations of medical education in meeting the needs of community health services.

This conference, held at Ulm, Federal Republic of Germany, from 6 to 10 July 1976, was co-sponsored by the World Health Organization and made possible by grants from the German Research Society, the German Federal Ministry for Youth, Family Affairs, and Health, and the International Institute for Scientific Cooperation, Schloss Reisenburg.

The individual papers and a summary of the conference form the first part of this publication. They are followed by the individual papers and a discussion of the Scientific Session of the 10th General Assembly of CIOMS in November 1976.
GREETINGS FROM DR. H. MAHLER, DIRECTOR-GENERAL, WORLD HEALTH ORGANIZATION

As Director-General of the World Health Organization, I send greetings to this Ulm Conference of the Council of International Organizations of Medical Sciences in which I am especially interested for several reasons. First, it is under the auspices of WHO and UNESCO that the CIOMS, convener of this gathering, was established. Also, since 1949 the Council has been a non-governmental organization in official relationship with the World Health Organization and, furthermore, the present meeting was organized in close collaboration with and under the co-sponsorship of WHO.

Our Organization has always observed with pleasure how the CIOMS has flourished and how its activities have evolved. Besides its original aim of facilitating communication within the international scientific community, it has developed a number of new and important functions which are very appropriate for a non-governmental organization such as CIOMS and which are also all complementary to WHO's actions in the relevant areas. These new programmes - to mention only two of them - include: the preparation of an international nomenclature of diseases, and the organization of a series of round table conferences - such as the present one - including the publication of their proceedings. Through this series of meetings, CIOMS has recently become a sort of "world conscience" for medical sciences. The extension of its activities to the field of training of health personnel is a most welcome development and yet another reason for gratification.

I feel strongly that an iconoclastic outlook and revolutionary changes are needed in the development of both health services and health manpower. Here radical changes should take place to bring about improvement. Ever since Hippocrates, so-called "health care" has been oriented towards the diseases of only a few privileged persons; this is also true of medical education, which has produced not health professionals but disease professionals. Now, through social revolution in public health, the orientation has to be directed towards the community's health in order to achieve our target, namely: health for all by the year 2000.

I strongly hope that from your deliberations will ensue dramatically imaginative, technically sound, and psychologically relevant new solutions to lead us on the road to progress. I am, therefore, wishing you a most rewarding and fruitful meeting, as well as all success in the future work of the Council.
PART 1

HEALTH NEEDS OF SOCIETY: A CHALLENGE FOR MEDICAL EDUCATION

10th CIOMS Round Table Conference

Ulm, Federal Republic of Germany, 6-10 July 1976

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SESSION I

HEALTH AND DISEASE AROUND THE WORLD

T.A. Lambo

Health, health services, and medical education

Medical science in recent decades equated disease-curative service with health care. Medical education was focused on the diagnosis and management of diseases which often were not major health hazards. This preoccupation is reflected in the services provided, consisting at best of a costly curative service for the very few in urban areas, making even those who can afford medical service dependent on such a service, dependent on drugs, dependent on hospital care. This is in sharp contradiction to the original WHO definition of health which stressed health for all and the interdependence of the promotion of health and the prevention and cure of disease. Health must be viewed in terms of overall social wellbeing. This recognition of health not being equatable with the cure of disease is now a source of change.

An attempt will be made to describe by reference to the present world situation (needs for health and health services) the problems that require resolution and hence to which the meeting should address itself.

World health situation

Despite every effort and a heavy expenditure of material and human resources, the health situation today is grave. The present trends are developing into a major crisis which must be faced at once if costly reactions are to be averted and present opportunities grasped.

(a) General

In spite of tremendous strides in medicine and technology, the health status of the majority of people in the disadvantaged areas of most countries of the world remains low. The seriousness of the problem is shown by the high morbidity and mortality rates that exist in the rural and peri-urban populations that still constitute 80-85% of the population of the world, where some 550 million people are still suffering from absolute poverty. Although morbidity and mortality show a downward trend, problems such as malnutrition, communicable diseases, parasitic infestations, and others continue to take a heavy toll of people's lives, especially those of infants, children, and other vulnerable groups in the disadvantaged areas. The low health status of
these people has not only manifested itself in terms of morbidly and mortality but has also affected human development and the capacity of individuals to develop their potentialities and lead a productive life.

The following section reviews some of the achievements improving the health situation, but also points to the major needs that still exist.

(b) Communicable diseases

Malaria. As at 31 December 1975, out of a world population of 3141 million, 2015 million live in areas which were originally malarious, while 1126 million are in areas where malaria was never indigenous or disappeared without specific antimalaria resources; 41% of the originally malarious areas, comprising a population of 824 million, are actually claiming malaria eradication. Another 1191 million people are in areas where the risk of being infected with malaria still exists. Of this under-risk population, 344 million are living in areas where no specific antimalaria measures are carried out, while 847 million are being protected by various methods of malaria control or eradication. It is estimated that, in the past year, there were 120 million cases of malaria. Of these, 100 million occurred in Africa and the remaining 20 million were mainly concentrated in South-East Asia, particularly in India and Pakistan.

Geographically, malaria has been eradicated in most of the temperate countries of the world, notably in Europe and North America. In the Mediterranean basin as an entity, the eradication of the disease is foreseen in the not very distant future, while prospects in the equatorial and tropical belt of the world vary very much from one continent to another. In America and the Western Pacific, the level of control is quite satisfactory but the situation is worsening in the south-eastern part of the Asian continent and has never been under control in Africa south of the Sahara.

Smallpox. By now, smallpox has been circumscribed to a few remote villages in mountainous and desert areas of Ethiopia, and in the rest of the world continuous surveillance activities are failing to detect any smallpox outbreaks. The disease was once endemic throughout the world, but during the first half of this century many countries became smallpox-free by means of extensive vaccination programmes and aggressive containment measures. By 1967, when WHO launched the global smallpox eradication programme in collaboration with Member States, the
disease was geographically limited to South America, South-East Asia, and Africa south of the Sahara. At that time it was considered that the disease was endemic in 30 countries in these regions.

During the last ten years the main strategic emphasis has been on the surveillance and containment of smallpox outbreaks. In the countries of South America and Africa south of the Sahara, special surveillance teams searched for and contained smallpox outbreaks while vaccination programmes were underway. By 1973, smallpox transmission was interrupted in those regions, leaving Ethiopia as the only remaining area with foci. Since 1973, further intensified programmes have been organized in the endemic countries on the Asian subcontinent. The national health services have mobilized their health personnel in an active search for smallpox, employing house-to-house visits; local volunteer workers have also cooperated in this campaign. The outbreaks thus detected have been rapidly contained. In view of the national and international importance of this successful programme in the history of medicine, 23 Member States, the United Nations Emergency Operation, and private donors have made contributions to it in cash and kind during 1975.

(c) Non-communicable diseases

Cardiovascular diseases are responsible for more deaths than any other reported cause in the Regions of the Americas and Europe. Malignant neoplasms are not the principal cause of death in any region but take second place in the Americas and Europe. Accidents also rank high among the principal causes of death. These mortality indications show that the developed countries are at present facing problems for which no ready and quick solution is yet in sight. Many of these problems demand radical departures from traditional approaches. Innovative thinking combining the results of biomedical and behavioural research and an adaptation of the philosophy as well as the organization of health services to this challenge seem to be essential prerequisites for ultimate success. In recent years, working hypotheses have converged towards practical approaches to a better definition of risk factors and early diagnosis of cardiovascular diseases, and it is hoped that effective prevention of this major group of diseases will result. This viewpoint governs the planning of population surveys, health education of the public, and the training of health personnel.
Recent observations have demonstrated that chronic diseases such as cardiovascular diseases, cancer, and certain liver and kidney diseases are becoming more commonly recognized in the developing countries, as are the cerebrovascular diseases. There are good reasons for attributing this quite largely to improved diagnostic procedures but it may also be indicative of a real increase in their incidence.

Assessment of the extent of morbidity from alcoholism is difficult for a variety of reasons: lack of records, lack of treatment facilities, lack of information on the degree of utilization of existing services, etc.

The health aspects of traffic accidents are of worldwide concern. It is estimated that more than 10 million people are injured on the world's roads each year; there are 250,000 deaths and the incidence of accidents is constantly increasing. The amount of disability that results from the associated morbidity is considerable, bearing in mind that in technically developed countries a substantial proportion of cases of cerebral injury in the community, as well as serious handicaps of a permanent nature, have been caused by road accidents. But the full extent of the morbidity cannot be estimated as not all injuries caused by road traffic accidents are officially recorded.

The worldwide trends in smoking-related mortality and morbidity are alarming. Tobacco-smoking is a major cause of chronic bronchitis, emphysema, and lung cancer, as well as a major risk factor for myocardial infarction, certain pregnancy-related and neonatal disorders, and a number of other serious health problems.

(d) Health care delivery

The health services which should aim at improving the health status of people are not doing so to the degree desired. The access of large segments of the world's population to health services is limited or non-existent. In other areas these services have often operated in an isolated manner, neglecting other factors contributing to human wellbeing such as education, communications, agriculture, social organization, community motivation, and involvement. One of the reasons for this is that the approach adopted has been largely promotive of highly sophisticated and centrally located medical care and, even when not so, has frequently been unrelated to local realities. Available resources (human, financial, and institutional), including training programmes, facility designs, and equipment purchases for use,
have been used mainly to provide this type of medical care in urban areas, thus benefiting only a minority.

Even more important, the consumer has often come to view the health services with dissatisfaction as reflected by either or both of the following:

- a low level of utilization, or under-utilization, of local health services, as manifested by refusal to attend or by preference for other forms of health care such as that provided by traditional healers or private practitioners;

- alienation and a feeling of helplessness on the part of the consumer, who cannot identify with the health services and personnel.

Health authorities have very often established health services within given geographical areas without considering their relevance to the existing situations and their acceptability to the population. Community development programmes, such as agricultural development, improvement of irrigation and transportation, and other health-related programmes which may offer a natural base for health services, have not been given due consideration. Other factors - such as poverty, lack of communication, poor environmental sanitation, inadequate housing conditions, shortage of water, etc. - have all contributed to the continuing low health status of the people.

(e) Future trends

If present trends continue, the existing gaps will be further widened. For example, the differences between urban and rural health services will be accentuated. The health services will continue to commit themselves to costly and specialized medical care, requiring most of the health budget, and thus the services will become even less accessible and unable to meet the demands of the majority of the population. Furthermore, if services continue to be provided in a fragmented and isolated manner, some problems of human development may be solved but others may be worsened or new ones created. For example, some activities of the health services may have succeeded in lowering morbidity and mortality rates in subsistence-level communities. However, without food production being increased, one problem has been solved (that of reducing infant and child mortality rates) and another problem created (worsened nutrition due to food shortage). Unless the problems of subsistence levels and poverty are tackled together, imbalances will occur.
It has been argued that an improvement in socio-economic conditions, even without increasing actions in the health sector, can improve the general health status of the people up to a certain level. On the other hand, disease interventions on their own have also been able to improve the level of health of the people as indicated by decreased morbidity and infant mortality rates. The two, however, have been able to do so independently only up to a certain point. A major improvement in people's health status and wellbeing requires continued action for socio-economic development, including health programmes and the active participation of the people. This implies that existing resources should be fully utilized and promoted through concerted action.

Responsive changes in health service delivery at the community level

The solution to the problem will require an approach integrating all the elements necessary to make an impact on the health status of the people, particularly the under-served groups. One approach which could respond to the various needs identified above is that known as "primary health care". The application of this approach will differ from one national setting to another. Primary health care consists of simple and effective measures, in terms of cost, technique, and organization, which are easily accessible to the people requiring relief from pain and suffering and which improve the living conditions of individuals, families, and communities. These measures are aimed at providing answers to fundamental human health needs.

Required national action

Many of the latest World Health Assembly resolutions emphasize the need for a "national will" as a prerequisite for effective action. This is difficult to define, as judgement upon its presence or absence often depends upon the actions by which it is expressed. In some countries it can be seen in clear expressions of policy at the highest levels of government, but in others the possibilities for change have not been explicitly put forward. If such possibilities can be developed, for example, as part of national planning of which country health programming is a part, then the basis for the expression of "national will" may result. While the need for action is clear, each country's response to this need may have to be unique, because of varying national responses to the different health needs within each country, as well as differences in social and cultural background, political structure, economic realities, and national practices and policies.
However, it is unlikely that any series of national and international efforts directed towards socio-economic development and the alleviation of poverty would be effective by themselves, even when coupled with a primary health care system of tolerable cost and in a form acceptable to the population. There are many additional facets that need to be considered in parallel, including a clear way of linking national policies to local decisions, a continuing manpower policy, a logistic support system, and a method of deciding, within each country, what are the health problems, at what point they should be attacked, and what are the appropriate tools to use in this endeavour. It is suggested that, in spite of these differences, countries or regions within countries where action is needed may follow one or more of the following broad courses of action:

- the selective development of a new tier of primary health care to under-served groups;
- the rapid expansion of existing health services, priority being given to primary health care;
- the reorientation of existing health services so as to establish a unified approach to primary health care as part of the health system;
- the maximum utilization of ongoing community activities, especially developmental ones, for the promotion of primary health care.

The challenge of medical education

If the health service system of most countries is failing to meet the felt needs of the majority of the people, the same criticism can be levelled at institutions responsible for training health personnel. In general terms, and obviously there are some noteworthy exceptions, medical education has not been sufficiently concerned with relevance - with the need to prepare graduates for the special health needs of the community they are to serve.

- The educational programmes have been disease-oriented, emphasizing diagnosis rather than prevention, management and evaluation.
- There is often undue emphasis on esoteric diseases, of interest perhaps to the professors but of doubtful concern to the community which bears the considerable cost of educating physicians.
- Insufficient attention is paid to developing the ability of future doctors to act as responsible members of health teams, although the need for this is generally accepted.

- There is little evidence that the educational programmes and processes have been constructed systematically so that learning is facilitated by the use of modern educational science.

Some examples only of the many shortcomings which undoubtedly could and will be considered in your discussion have been cited. Let us all be clear that a necessary, if not sufficient, condition for improvement in health care is that sufficient manpower should be available with the knowledge, skills, and attitudes needed for effective health care, and that medical education is therefore one essential element for improvement.

Overview and suggested points for discussion

There seems no doubt that during the last decade new directions for health and medical education have been developing. This evolution is based on the relevance of health care systems and medical education to "social progress and economic feasibility". The benefits include improved accessibility and continuity of care; decreased wastage of specialized health resources; improved coordination of health care and other social services in dealing with patients and families; the eventual evolution of more effective health maintenance and promotion.

Responsive changes in education for the health professions are taking place in some countries where new elements have been introduced into medical education. These include the acquisition of experience in dealing with the host of cultural, social, and economic factors that impinge on community health care. This reorientation of medical education is likely to lead to a "social penetration" at the periphery.

The following points are suggested for discussion:

- How can national health policies be developed by planning mechanisms in which providers and consumers of health care play an active role?

- How can national health policies foster joint medical education and health care action?

- How can government action in health care and education for the health professions be coordinated and implemented?
- How can cooperative international efforts contribute to government action in health care and education for the health professions?
HEALTH AND DISEASE IN AN INDUSTRIALIZED COUNTRY: IMPLICATIONS FOR MEDICAL EDUCATION
T.M. Fliedner & S. Biefang

Introduction

In this session of the Conference, we want to consider the status and possible development of health and disease in the various societies around the world. This analysis should make it possible for us to define more closely the role of the medical doctor in such societies and the goals that might be set for educating physicians in the way in which they may best serve the needs of their society.

It is the purpose of our remarks to point out a few problems and raise some questions. First let us remind ourselves about the period of practice for which doctors are being trained. This may help us to focus better on the problems that they have to face. Secondly, let us ask about the problems of health and disease in our societies now and what they might be at a time when our students will exercise their art. It is also important to raise the question of how to monitor health and disease in our society. And, thirdly, let us consider what needs to be done to improve our knowledge and prepare us and our students better to serve the health needs of our societies today and tomorrow.

Period of practice for which physicians are being trained today

The students entering our medical school this year are about 20-22 years of age. They will complete their basic training as physicians by about 1983 - if we don't want to mention the famous year 1984 as described so vividly in George Orwell's novel. If these young doctors want to specialize in certain fields, they must undergo a further period of training which may last at least 5-7 years. This means that our students of today will really be actively engaged in their professional life during the period 1990-2025. Thus, if we consider "health needs of society as a challenge for medical education", it would probably mean that we should try to analyse the health needs of our societies as they will arise rather than as they are or may have been. The reality, as we will see, is, however, quite remote from the desired situation. We have little factual information on the real health needs of society today or tomorrow. And our conference may stimulate the various governmental and non-governmental agencies and associations to recognize the lack of hard information and do something about it.
Let us talk about some general developments in order to try to establish some basic consensus. In Fig. 1, we have plotted the life expectancy patterns in the past, in the present, and possibly in the future. In ancient times there was high mortality early in life with only a few people reaching old age. The average life expectancy was short, perhaps around 30 years. In the last few centuries, and particularly in the present century, this early mortality has dropped considerably. It has been shown that the increase of some 20 years in the average life expectancy of an individual born today as compared to one born in 1900 is mainly due to the decrease in neonatal mortality and to the successful management of infectious diseases. Thus, average life expectancy today is probably around 70 years, while the upper limit of human life appears to be between 90 and 100 years of age. Perhaps we might discuss whether it is possible and desirable to aim medical research at trying to provide data on how to prolong human life further, let us say by a factor of 1.5 or 2.0.
Implications

It appears to us that a lot of new research would have to be done in order to understand the reasons for the life-terminating processes of aging and for eventual causes of death. But we probably agree that it may be difficult and perhaps not even desirable (in a society aiming at a steady state rather than further expansion) to extend human life beyond, say, 100 years. If we compare the present survival curve of people in an industrialized society with a constructed curve that could perhaps be achieved if the bulk of people of a society reach the upper limit of their possible life expectancy, then we realize that health care efforts should really seek to push the survival curve upwards rather than to the right. The shaded area thus represents some of the most important health challenges of our societies. In other words, should we train our students simply to deal with the problem of reducing mortality in our society? Is that the major goal to be achieved? If so, we should look at the available mortality statistics and use them in establishing priorities for medical education and creating curricula.

We probably feel strongly that this cannot be the real need of our societies and hence certainly not the only goal to be set in training physicians.

In recent years, people have been increasingly concerned about their health. Health is considered to be among the highest of values. However, it is interesting to realize—this clearly came out in a study performed by Dr von Schmädel in our university—that health may be considered of secondary importance by many people if it is necessary to impair it for reaching a goal considered more important, such as a higher social status. Nevertheless, we all realize that people in our societies are quite concerned about their health. It appears also that for them not only is it important simply to live, but they want to enjoy health in the full sense of the definition brought forward by WHO, i.e., in the sense of physical, mental, and social wellbeing. Thus, to the purely physical meaning of being alive, a qualitative aspect must be added: life of a useful quality. In other words, if we now plot 100% of useful or of productive life graphically against a time-scale, we could ask ourselves what the average "productive life-span" was yesterday, is today, and might or should be tomorrow. We think that by "productive life" is meant a life during which a person can enjoy his physical, psychological, mental, and social wellbeing to achieve the highest possible degree of self-fulfilment within the limits set by his fellow men. We would visualize again a shaded area of "unproductive life" that could be improved by all
kinds of measures. Some of these measures would have to be provided by the medical profession. The sentence, "Some people die when they are 30 and are buried when they are 70" is attributed to the French writer Balzac. So, if we want to characterize the health needs of society, we must consider not only the major killers of our society, but also those health problems that impair what might be called a "productive" or "useful" life, and affect the "quality of life".

Health and disease and their measurements

From what has been said it becomes obvious that we need factual information on mortality and morbidity in a population in order to characterize its pattern of health and disease. We will see how limited we are in this respect. But we are even more limited in the assessment of health and disease in a qualitative sense. How can we measure the "quality" of a life that is lived? How can we measure and establish - be it in an individual or in a society - the maximal possible degree of productivity in the physical, mental, and social sense and its impairment by disease that could be corrected by specific measures, some of them to be offered by the medical profession? This line of thinking has prompted a whole new area of research that has become most prominent in the USA and appears to be completely undeveloped in our own country; it is the area of "health indicator research" as part of "social indicator research". In this field, as we understand it, the attempt is made to measure medical and social aspects of the quality of life in a population and also for an individual. Since health and disease are part of the quality of life or its impairment, the development of health indicators already forms a large proportion of the total effort.

But let us go back to characterize health and disease with the available tools, i.e., mortality and morbidity statistics. In Table 1 (taken from the work of Professor Jesdinsky) you can see the various "killers" in the Federal Republic of Germany, in order of frequency, and the major age groups affected.

From these data it can be seen that mortality in this country is primarily due to cardiovascular diseases, to neoplastic diseases, to diseases of the respiratory organs, to those of the digestive tract, to metabolic diseases and to accidents, to name only the five or six most frequent "killers". In quantitative terms: about 319 000 men and 322 000 women died in 1973 from these few diseases. These figures represent 87%
Table 1. Mortality in the Federal Republic of Germany, 1973

<table>
<thead>
<tr>
<th>Underlying condition</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>order of frequency</td>
<td>predominant age group</td>
</tr>
<tr>
<td></td>
<td>(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>1</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Neoplastic diseases(^b)</td>
<td>2</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>3</td>
<td>0 + 3</td>
</tr>
<tr>
<td>Digestive tract diseases</td>
<td>5</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Accidents, etc.(^c)</td>
<td>4</td>
<td>1 + 3</td>
</tr>
<tr>
<td>Metabolic diseases</td>
<td>8</td>
<td>0 + 3</td>
</tr>
<tr>
<td>Urinary tract and genital diseases</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Mental diseases and suicide</td>
<td>6</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>Perinatal diseases, malformations</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Neurological diseases</td>
<td>11</td>
<td>0, 2, 3</td>
</tr>
<tr>
<td>Infectious diseases</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Musculo-skeletal diseases</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Blood diseases</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Skin diseases</td>
<td>14</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Pregnancy - childbirth</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\(^a\) 0 = 0-14 years; 1 = 15-39 years; 2 = 40-64 years; 3 = 65 years+
If several age groups are affected, the most prominent is underlined.

\(^b\) Including neoplastic disease of the blood.

\(^c\) Non-natural causes of death except suicide.
of deaths from all causes. All of us are aware of the difficulties created by the nature of the information on which they are based. Complete information on mortality in the Federal Republic of Germany since 1968 is centrally available. This, however, is based on the death certificates filled out by the physicians witnessing the deaths. Thus, the reliability of these statistics depends on the reliability of the physician's information and also on his judgement as to the cause of death, which may or may not be identical with the true cause of death. But they nevertheless constitute one of the indicators that we have for characterizing health and disease in a society.

Another piece of information on health and disease in the Federal Republic of Germany comes from the household "microcensus" that has been taken since 1966. In this microcensus, people are asked by laymen about health and disease in their families. These questions to a fraction of the population (0.1%) were repeated in 1970, 1972 and 1973. The results are used to indicate the presence of health impairments in a population. The reliability of the information is certainly limited because it is based on self-observation without consultation or examination by a physician. The classification of disease does not correspond to the International Classification of Diseases (ICD). In the USA, morbidity statistics are more reliable because they are based on representative population samples examined by medical doctors. Nevertheless, Table 2 gives microcensus data for 1973.

Table 2. Morbidity, Federal Republic of Germany, according to microcensus data, 1973

<table>
<thead>
<tr>
<th>Health problems</th>
<th>Males order of frequency</th>
<th>predominant age group</th>
<th>Females order of frequency</th>
<th>predominant age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory organs</td>
<td>1</td>
<td>0 + 1</td>
<td>1</td>
<td>0,1,2,3</td>
</tr>
<tr>
<td>Cardiovascular organs</td>
<td>2</td>
<td>2 + 3</td>
<td>2</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Musculo-skeletal system</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Digestion</td>
<td>4</td>
<td>1 + 2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Accidents</td>
<td>3</td>
<td>1 + 2</td>
<td>7</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Nerves and central nervous system</td>
<td>6</td>
<td>2 + 3</td>
<td>5</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Metabolism</td>
<td>8</td>
<td>2 + 3</td>
<td>6</td>
<td>2 + 3</td>
</tr>
<tr>
<td>Urinary tract and genital organs</td>
<td>9</td>
<td>2 + 3</td>
<td>8</td>
<td>1 + 2</td>
</tr>
<tr>
<td>Infectious diseases</td>
<td>7</td>
<td>0 + 2</td>
<td>9</td>
<td>0 + 1</td>
</tr>
<tr>
<td>Mental health</td>
<td>10</td>
<td>1 + 2</td>
<td>10</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Skin diseases</td>
<td>11</td>
<td>1</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Malignant growth</td>
<td>12</td>
<td>2 + 3</td>
<td>12</td>
<td>2 + 3</td>
</tr>
</tbody>
</table>

a See Table 1, footnote a.
Of major health problems, those associated with the respiratory organs, the cardiovascular organs, the musculo-skeletal system, the digestive tract, and accidents are again in the foreground, whereas the malignant diseases rank last. In fact, in 1973 diseases in these categories affected 4.2 million men and 4.8 million women, representing 80% of all diseased conditions.

Another piece of information comes from the social insurance institutions in the Federal Republic of Germany. They are responsible for providing pensions to those persons who cannot work any more because of health impairment and have to retire prematurely. Table 3 shows that a large number of people have to retire early (between 40 and 64 years of age) from active employment because of a variety of health problems, the most prominent being those relating to the cardiovascular system, the musculo-skeletal system, malignant tumours, the central nervous system, and the respiratory tract. In fact, in 1973 16 000 men and 16 100 women retired early because of these conditions, which account for 79% of all pensions provided. Again, the reliability of the information on which these statistics are based is questionable. But they do serve to indicate the pattern of health and disease in an industrialized society. They show that many people do retire from a "productive" life long before a normal age of retirement and long before their eventual physical death.

Table 3. Morbidity, Federal Republic of Germany, on the basis of social security pensions granted after premature retirement, 1973

<table>
<thead>
<tr>
<th>Health problems</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>order of frequency</td>
<td>predominant age group&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cardiovascular system</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Malignant tumours</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Musculo-skeletal system</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Mental problem</td>
<td>7</td>
<td>1 + 2</td>
</tr>
<tr>
<td>Digestive system</td>
<td>6</td>
<td>1 + 2</td>
</tr>
<tr>
<td>Central nervous system and nerves</td>
<td>4</td>
<td>1 + 2</td>
</tr>
<tr>
<td>Accidents</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Metabolism</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Infectious diseases</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Urinary tract organs</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Skin</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

<sup>a</sup> See Table 1, footnote<sup>a</sup>.
The relative importance of diseases in a society

Information gathered from mortality and morbidity statistics of this type is an unsatisfactory basis for the development of corrective measures, for setting priorities in research, or for establishing goals for medical education in the future. It certainly needs to be considerably improved. But even then, is it the type of information that allows us to describe health in our society in the sense of the WHO definition, as physical, mental, and social wellbeing or as their impairment? For this, we do need further indicators, i.e., reliable "health indicators" to describe to us the health problems that our society may be facing and to evaluate the efficiency of measures to correct obvious deficiencies in health status.

In a recent study we tried to use the available information to rank the diseases of various organ systems in our society in a slightly different way, in an attempt to include some qualitative aspects of health and disease.

For a qualitative estimate of the impairment caused by disease, we used a combination of the indicators "age group affected by disease", "age at the time of professional incapacity", and "age at the time of death". For a quantitative estimate of the importance of different diseases, we used the frequency of particular groups of diseases in the population. By using this type of information, it is possible to correlate the degree of health impairment or the impairment of "productive life" by a disease with its frequency. Diseases and impairments can then be ranked according to their social importance. We found the most important problem area to be that of diseases of the respiratory tract. The second most important area for men and women is diseases of the circulation. The third rank for men is shared by accidents, diseases of the digestive organs, and diseases of the musculo-skeletal system. In women, the sequence is slightly different. Diseases of the musculo-skeletal system have a higher rank.

We are aware, of course, that this is far from being the ideal basis for a statement on health and disease in our society, but it does suggest how to approach the problem of the impairment of health in a given society.

This line of thinking leads of course to the postulate that any accurate determination of the health status of a
Implications

population requires statistics of high quality on the morbidity as well as the mortality from a given disease and on its consequences with respect to the impairment of productive life. It is here that new approaches in epidemiological and health indicator research become necessary, but there should also be a re-consideration of the legal and administrative aspects of the problem of obtaining the necessary statistical data.

Conclusions

In sum, our remarks were intended to show that (1) it is not easy to quantify the pattern of health and disease in a particular society. The statistical basis for this is poor, particularly when one goes beyond mortality data into data concerning morbidity. It is even worse when one wants to estimate the qualitative impairment of the "productive life" by disease. It is here that research on health indicators should provide exciting results in the next few years. This leads to the conclusion that (2) it will be necessary in the future to ask more about those diseases that impair the useful life rather than those that shorten life. This will certainly lead to increasing concern about the prevention and treatment of chronic diseases with an early onset leading to a late death, and also about the rehabilitation of the patients. It is here that new avenues for basic and pathological research should be found. As regards the training of medical doctors, this type of thinking emphasizes (3) the question of the early diagnosis of diseases showing a chronic course and the control of such diseases (living with them), rather than their cure, until effective methods of prevention and cure have been found through basic research.
SOME CHARACTERISTICS OF THE HEALTH OF THE POPULATION OF THE USSR

G. Cerkovnyj

In the conditions of a socialist society, health protection and promotion, the prevention of diseases, and the prolongation of an active and productive life are the main goals of the public health services.

Care of the health of the people in the conditions of socialism is not only personal, but also a public and social necessity. Health services are inseparable from the Soviet state system and constitute an important element of the complex socio-economic mechanism of the socialist society, being a system of state and public arrangements aiming at the prevention and treatment of diseases and the creation of the conditions necessary for the work, everyday life, and leisure of the people, etc.

By the beginning of 1976, the public health services in the USSR represented an important branch of the national economy in which more than 6 million people are engaged, including over 800,000 doctors (32.6 per 10,000 population); and there are more than 3 million hospital beds (118 beds per 10,000 population).

The state of health of the people must be considered as one of the important indices of the socio-economic development and of scientific and cultural achievement.

Normally human health is considered not only from the point of view of the absence of disease and disability, but also as a state of physical, mental and social wellbeing, which makes it possible to carry out one's public and professional activities without any restriction.

Public health services and medical science do not yet have methods available for the complex task of determining quantitatively all the components that could characterize the state of health of the people. Usually the following criteria are applied in evaluating the state of health of the people:

(a) demographic indices (birth rate, mortality, causes of death, life expectancy);
(b) morbidity indices;
(c) indices of physical development in the main age and sex groups.

Many factors influence the state of health of the people, and the most important role is played by the social factors, which affect human health and morbidity in several ways:

(1) as the basis for improving the health of the people (this is better realized in the conditions of a socialist country);

(2) as being among the possible causes of illness (for example, the increase in the incidence of mental diseases in the capitalist countries is the result of a feeling of uncertainty about the future);

(3) as strengthening other factors (for example, chronic malnutrition contributes to the activity of infections);

(4) as the factors slowing or accelerating some diseases, etc.

Socio-economic development, improvements in the material and social wellbeing of the people in the conditions of socialism, the provision of high-quality medical care for the population, achievements in medical science - all these factors have a positive effect on the state of health of the people. In the USSR, within a comparatively short period, changes in the health of the people have taken place for which other countries needed centuries.

By comparison with the period before the revolution, general mortality has decreased 3.3 times and infant mortality has decreased 9.6 times.
Table 1. Natality, general mortality, natural increase, and infant mortality in the USSR

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of live births</th>
<th>Number of deaths</th>
<th>Natural increase</th>
<th>Deaths under 1 year of age per 1000 live births</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>45.5</td>
<td>29.1</td>
<td>16.4</td>
<td>268.6</td>
</tr>
<tr>
<td>1940</td>
<td>31.2</td>
<td>18.0</td>
<td>13.2</td>
<td>181.5</td>
</tr>
<tr>
<td>1950</td>
<td>26.7</td>
<td>9.7</td>
<td>17.0</td>
<td>80.7</td>
</tr>
<tr>
<td>1955</td>
<td>25.7</td>
<td>8.2</td>
<td>17.5</td>
<td>59.6</td>
</tr>
<tr>
<td>1960</td>
<td>24.9</td>
<td>7.1</td>
<td>17.8</td>
<td>35.3</td>
</tr>
<tr>
<td>1965</td>
<td>18.4</td>
<td>7.3</td>
<td>11.1</td>
<td>27.2</td>
</tr>
<tr>
<td>1970</td>
<td>17.4</td>
<td>8.2</td>
<td>9.2</td>
<td>24.7</td>
</tr>
<tr>
<td>1974</td>
<td>18.0</td>
<td>8.7</td>
<td>9.3</td>
<td>27.9</td>
</tr>
</tbody>
</table>

The general decrease in mortality is a result of the great decrease in mortality in the young and middle-aged population groups.

Table 2. Mortality of the population by age group (number of deaths per 1000 population in each age group), 1896-97 and 1973-74

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>1896-97 (A)</th>
<th>1973-74 (B)</th>
<th>(B) as percentage of (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>32.4</td>
<td>8.7</td>
<td>26.8</td>
</tr>
<tr>
<td>0-4</td>
<td>133.0</td>
<td>7.7</td>
<td>5.8</td>
</tr>
<tr>
<td>5-9</td>
<td>12.9</td>
<td>0.7</td>
<td>5.4</td>
</tr>
<tr>
<td>10-14</td>
<td>5.4</td>
<td>0.5</td>
<td>9.2</td>
</tr>
<tr>
<td>15-19</td>
<td>5.8</td>
<td>1.0</td>
<td>17.2</td>
</tr>
<tr>
<td>20-24</td>
<td>7.6</td>
<td>1.6</td>
<td>21.0</td>
</tr>
<tr>
<td>25-29</td>
<td>8.2</td>
<td>2.0</td>
<td>24.4</td>
</tr>
<tr>
<td>30-34</td>
<td>8.7</td>
<td>2.8</td>
<td>32.2</td>
</tr>
</tbody>
</table>

(continued on next page)
Table 2. (continued)

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>1896-97 (A)</th>
<th>1973-74 (B)</th>
<th>(B) as percentage of (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35-39</td>
<td>10.3</td>
<td>3.6</td>
<td>34.9</td>
</tr>
<tr>
<td>40-44</td>
<td>11.8</td>
<td>4.9</td>
<td>41.5</td>
</tr>
<tr>
<td>45-49</td>
<td>15.7</td>
<td>6.4</td>
<td>40.8</td>
</tr>
<tr>
<td>50-54</td>
<td>18.5</td>
<td>8.8</td>
<td>47.6</td>
</tr>
<tr>
<td>55-59</td>
<td>29.5</td>
<td>12.3</td>
<td>41.7</td>
</tr>
<tr>
<td>60-64</td>
<td>34.5</td>
<td>18.2</td>
<td>52.7</td>
</tr>
<tr>
<td>65-69</td>
<td>61.6</td>
<td>27.0</td>
<td>43.8</td>
</tr>
<tr>
<td>70</td>
<td>89.0</td>
<td>73.5</td>
<td>82.6</td>
</tr>
</tbody>
</table>

Demographic changes have taken place in all the republics. But if we consider the birth and mortality rates, the republics fall into three groups, according to their common characteristics. Lower birth rates and higher mortality rates than the average for the country as a whole are found in the RSFSR, the Ukraine, Latvia, Lithuania, and Estonia. Higher birth rates and lower mortality rates occur in Kazakhstan, Usbekistan, Turkmenistan, Kirghizia, etc.

Such irregularities in the indices are characterized by differences in age structure between populations which, in turn, makes it necessary to use different approaches to the organization of medical care in the various parts of the country.

In 1971-72 the expectation of life at birth, which was 32 years in 1896-97 and 44 years in 1926-27, became 70 years for the population as a whole and 74 years for females.

Changes have taken place not only in the rates but also in the pattern of mortality; this is due to a number of factors including changes in the morbidity pattern.

In 1973, deaths from four groups of diseases - cardiovascular diseases, malignant neoplasms, respiratory diseases, and accidents, made up 88.4% of all deaths in the country.
Of 2164.2 thousand persons who died in 1973, 1061.4 thousand (49.0%) died of cardiovascular diseases (425 per 100 000 population). In this latter group, ischaemic heart disease and cerebrovascular diseases accounted for 88% of all deaths. In second place were malignant neoplasms, which caused 327.8 thousand deaths (15.1%) or 131.3 per 100 000 population. In the period 1961-73 the index of mortality from malignant neoplasms increased from 118.1 to 131.3 per 100 000 population. The structure of mortality from malignant neoplasms also changed. While mortality from lung cancer and cancer of the breast increased, mortality from cancer of the digestive tract and some other sites decreased. General and standardized indices show some differences in mortality in different republics of the country, but in all republics mortality is greater for males than for females (in 1970 it was 1.8 times greater for all the country, and 7.4 times greater as regards mortality from malignant diseases of the lungs.

Great changes have taken place not only in mortality, but also in morbidity, as a result of the aging of the population and improvements in diagnostic methods, an increase in the number of specialized hospitals, and, to some extent, real changes in the pattern of morbidity. The following data from the statistics on malignant neoplasms show the changes in morbidity during recent years.

Table 3. Morbidity from malignant neoplasms in the USSR, 1961-73

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence of malignant neoplasms (first in vivo diagnoses recorded by oncological establishment) absolute figures per 100 000 population</th>
<th>Prevalence of malignant neoplasms (number of malignant neoplasm cases under control of oncological establishment at end of year) absolute figures per 100 000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>303</td>
<td>812</td>
</tr>
<tr>
<td>1962</td>
<td>326</td>
<td>878</td>
</tr>
<tr>
<td>1963</td>
<td>341</td>
<td>952</td>
</tr>
<tr>
<td>1964</td>
<td>381</td>
<td>1041</td>
</tr>
<tr>
<td>1965</td>
<td>383</td>
<td>1110</td>
</tr>
</tbody>
</table>

(continued on next page)
Table 3. (continued)

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence of malignant neoplasms</th>
<th>Prevalence of malignant neoplasms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>absolute figures</td>
<td>per 100 000 population</td>
</tr>
<tr>
<td>1966</td>
<td>399</td>
<td>172</td>
</tr>
<tr>
<td>1967</td>
<td>405</td>
<td>172</td>
</tr>
<tr>
<td>1968</td>
<td>418</td>
<td>175</td>
</tr>
<tr>
<td>1969</td>
<td>419</td>
<td>174</td>
</tr>
<tr>
<td>1970</td>
<td>430</td>
<td>177</td>
</tr>
<tr>
<td>1971</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>455</td>
<td>184</td>
</tr>
<tr>
<td>1973</td>
<td>466</td>
<td>187</td>
</tr>
</tbody>
</table>

Between 1961 and 1973 the number of people registered in oncological establishments almost doubled.

This increase is mainly a result of the increase in the number of people in remission after a course of treatment, who in 1960 made up 76.2% and in 1973 made up 84.3% of all those registered at the end of the year. In 1973, for 22.9% of all those registered, the diagnosis had been made 10 or more years earlier. If we take into consideration changes in the age structure of the population, the changes in cancer morbidity are not so great.

Table 4. Number of people with newly diagnosed cases of malignant neoplasms per 100 000 population (standard population*)

<table>
<thead>
<tr>
<th>Years</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962-63</td>
<td>179.4</td>
<td>132.4</td>
</tr>
<tr>
<td>1966-67</td>
<td>205.1</td>
<td>144.6</td>
</tr>
<tr>
<td>1972-73</td>
<td>213.6</td>
<td>145.4</td>
</tr>
</tbody>
</table>

* Standard population = population of 46 countries round about 1950

Cardiovascular diseases and malignant neoplasms, which take the lead in the pattern of mortality, have also changed their place in the pattern of general morbidity.

For example, during studies of morbidity in Kalinin these diseases showed the following percentage ratios to all diseases:

<table>
<thead>
<tr>
<th></th>
<th>1958</th>
<th>1969-71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>7.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>1.1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

In a morbidity study in a group of industrial cities in 1939-40, much lower percentage ratios were recorded:

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>3.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>0.4</td>
<td>0.5</td>
</tr>
</tbody>
</table>

According to the same study, infectious and parasitic diseases accounted for 28.2% of total morbidity in males and 26.4% of morbidity in females. In the city of Kalinin in 1961-71 these diseases accounted for only 17.8% of total morbidity.

A great change can also be seen in the communicable disease pattern, especially if it is considered over a long period of time. In 1919 in the USSR 186 thousand cases of smallpox were registered. In April 1919, V.I. Lenin signed the decree on compulsory smallpox vaccination, which was the beginning of the mass smallpox vaccination of the population and played the main role in the fight against smallpox in the USSR. By 1936 natural smallpox in the country had been abolished.

In 1919-21 from 25 to 40 thousand cases of cholera a year were registered. In 1926 there were no cases of cholera in the country.

During the first years of Soviet rule (1917-1922) 20 million cases of epidemic louse-borne typhus were registered in the USSR. In spite of the increase, during the war, of morbidity in the occupied part of the territory of the USSR, which followed a decrease in morbidity to a few cases in the pre-war years, in 1948 there were no cases of epidemic louse-borne typhus in the USSR.
Special attention should be paid to malaria morbidity, the dynamics of which show the operation of the preventive principle applied by the Soviet health services. Before the revolution there were about 4 million cases of malaria in Russia. By 1930 the number of cases had decreased. But in 1932 a new increase of morbidity took place, and in 1934 there were 9 million registered cases of malaria in the country. Special measures were taken to improve the diagnosis and treatment of malaria, and specific activities were carried out on natural reservoirs of the disease. As a result, despite the increased morbidity in the occupied districts during the war, only 781,329 cases of malaria were registered in 1950, i.e. 10 times fewer than in 1934. In 1946-49 about 50 million people were tested for malaria and about 3 million hectares of reservoirs were treated every year. By 1960 there were only 425 cases of malaria. In 1965, of 392 cases of malaria, only 44% were of local origin, the rest being imported from abroad.

Another example of the scientific and organizational activity of the Soviet health services is the elimination of trachoma in the country. At the beginning of the twentieth century no region in Russia was without cases of trachoma. In 1913 in the European part of Russia there were 885,789 registered cases. But during special mass investigations many more cases were diagnosed. For example, in the former Kazan province, of 166 thousand people examined in 1913, 25.5% suffered from trachoma. In some districts of Russia an even greater proportion of the population was affected. By 1941 great progress had been made towards the elimination of the disease. In 1956 there were 911,463 registered cases; in 1959 265,315 cases, and in 1965 only about 2000 cases. Now there are no cases of trachoma in the country.

The situation with childhood infections has also greatly changed in recent times. In 1974 there were only 139 registered cases of poliomyelitis as compared with 22,054 cases in 1958. The number of cases of diphtheria is about 200, whereas in 1955-58 it was more than 120,000 a year, and in 1940 it was 177,000. The virtual elimination of poliomyelitis and diphtheria is the result of a great preventive effort against these diseases.
Widespread vaccination against whooping cough and measles made it possible to reduce morbidity from these diseases.

Table 5. **Morbidity from whooping cough and measles in the USSR (cases per 100,000 population)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Whooping Cough</th>
<th>Measles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>925</td>
<td>379</td>
</tr>
<tr>
<td>1960</td>
<td>972</td>
<td>259</td>
</tr>
<tr>
<td>1965</td>
<td>922</td>
<td>82</td>
</tr>
<tr>
<td>1970</td>
<td>194</td>
<td>16</td>
</tr>
<tr>
<td>1971</td>
<td>240</td>
<td>17</td>
</tr>
<tr>
<td>1972</td>
<td>118</td>
<td>14</td>
</tr>
<tr>
<td>1973</td>
<td>115</td>
<td>12</td>
</tr>
</tbody>
</table>

Conditions have been created for the elimination of these diseases in the near future.

Among the infectious diseases, the first place is now taken by respiratory diseases, with influenza accounting for about 20% of all registered diseases. They are the main cause of temporary disability, ranking first in the structure of morbidity, and figuring among the first four causes of death.

The Twenty-fifth Congress of the Communist Party of the Soviet Union, which took place in the spring of 1976, stated that the main needs in the field of medical science are:

1. To intensify research in the fields of molecular biology and the physiological, biochemical, and immunological aspects of the human organism in order to hasten the solution of the most important medical and biological problems arising in the struggle against cardiovascular, malignant, endocrine, mental, viral and occupational diseases.
(2) To continue research on ways of improving the working environment and on the problems of rational nutrition.

These are some characteristics of the changes that have occurred in the health of the population of the USSR.
Among the more knowledgeable and thoughtful observers concerned with the relationship between health and society, there seems recently to have emerged a consensus of sorts which runs as follows: the contributions that can be made by additional increases in the availability or use of medical services in industrialized societies are relatively small if not marginal; nor does a greater equalization of access to medical care (via more egalitarian insurance schemes or income distribution) appear likely to make that great a difference. The point of leverage for producing a significant contribution to improved health is in stressing non-medical measures to be taken by the patients themselves. In brief, individuals must learn to smoke less, drink less, eat less, and have a more proper diet, etc. This is, for instance, a major conclusion of Who Shall Live, the most recent book by Victor R. Fuchs, a leading American health economist. Fuchs writes: "There is no reason to believe that the major health problems of the average American would be significantly alleviated by increases in the number of hospitals or physicians." Further, argues Fuchs, "The greatest current potential for improving the health of the American people is to be found in what they do and don't do to and for themselves. Individual decisions about diet, exercise, and smoking are of critical importance, and collective decisions affecting pollution and other aspects of the environment are also relevant."

René Dubos is quoted as having observed, "To ward off disease or recover health, men as a rule find it easier to depend on the healers than to attempt the more difficult task of living wisely."

Before we express our differences with a major implication of this approach, we shall present the argument in greater detail to do justice to it. First, it should be noted that the approach is backed up by data rather than merely philosophical or moral arguments. Among the relevant pieces of evidence is the finding that, in highly "medicated" societies, increases in the number of physicians or hospitals are not correlated with significant health gains. Writes Fuchs, "Once basic levels of medical sophistication, personnel, and facilities become available, additional inputs of medical care do not have much effect. In other words, the total contribution of modern medical care to life expectancy is large, but
over the considerable range of variation in the quantity of care observed in developed countries, the marginal contribution is small."

Moreover, Fuchs and the others who take this position do not hold it dogmatically. For example, Fuchs recognizes that new medical care breakthroughs sometime in the future might result in dramatic improvements in health status (although they might have the opposite effect) and that income redistribution still has a potential for reducing infant mortality.2

In addition, there are data which suggest that, past a certain point, additional investments in medical care may be counter-productive, resulting in overutilization of medical services. Since there is often a health risk associated with medical procedures, except of the most routine sort, the problem of detrimental health effects as well as financial waste from unnecessary medical care has caused growing concern. Unnecessary surgery, in particular, appears to be correlated with numbers of surgeons and hospitals. Approximately four-fifths of America's physicians are consulting specialists, although one observer suggests that a reasonable figure for the number of specialists required is one-fifth.3 The surgical practices attract the largest percentage of physicians wishing to specialize, a fact which may explain the rate of surgical operations in the USA being double the per capita rate in England and Wales.3 Surgeons themselves recognize the overabundance of surgical specialists in the nation. The American Surgical Association conducted a massive $1.5 million five-year study on surgical services and concluded that there are between 22,000 and 34,000 surgeons too many in the USA.4

When all is said and done, the thesis before us is clearly very important, as much of the public and private health monies and attention are still focused on medical costs, which increasingly compete with and drive out other services, as the proportion of investment in medical care rises - in the USA, for instance, from 4.6% of the Gross National Product in 1955 to 7.7% in 1974.5 As we see it, there is much truth in the analysis, but it might point to a rather different conclusion than that we all ought to live wisely and would be healthier if only we had stronger will-power.

Before our major departure from this view is introduced, a smaller one must be disposed of. We wonder to
what extent the evidence linking some of the self-cures and the healthier populace is as potent as is often implied. Thus, while the evidence connecting smoking of cigarettes with illness is strong, and that connecting excessive consumption of alcohol with illness is similarly strong, evidence about the ill effects of other forms of drug abuse is quite a bit less compelling (particularly poor for marijuana, but not completely compelling even for heroin). Above all, one wonders if the links between diet and exercise and health are well established. Is, for instance, high cholesterol largely a matter of genetic predisposition? Can it be much reduced via diet? And can it not be reduced rather effectively through medication?

Similarly, is the evidence about the ill effects of being overweight (as distinct from being obese) based on differences in the mortality and morbidity of people of different weights, given the same basic morphological structure, or on comparisons of those who have reduced their weight with those who have not? To the extent that the data are primarily of the first kind, it might well be that persons who are overweight, but reduce, will not have all or many of the benefits associated with "originally" lower-weight persons, either because of the physiological and psychic strains dieting entails (most weight losers put it on and take it off many times?) or because their lowered weights may not be compatible with their systems.

Similarly, is the evidence about the correlation between exercise and health based on the better health of people athletically inclined (in which case third factors may be responsible for both their better health and higher level of activity - e.g., their higher energy level), or is it based on the benefits gained from exercising by normally sedentary people?

All of these questions are raised because obviously we do not wish to exhort people to mobilize their will-power if the result of such exercise may be futile or harmful. Secondly, and much closer to our main point, the opposition between personal will and medical care is too pat. As every pediatrician who provides children with orange-flavoured aspirin knows, the medical care regimens determine in part the measure of will-power required to behave in a healthy manner. The issue is clouded by moralism because American society (and many physicians) attribute positive values to those "strong individuals" with strong will-power and consider a lack of will-power to be unmasculine and a sign of weakness. But
if one views the matter from the viewpoint of health results, if medical intervention can make it easier for a population with a given distribution of "will-power" - some weak, some strong - to comply, the population will be healthier.

As this point is often overlooked on the general level (less so, in practice, as many efforts to make treatments less taxing illustrate) its significance deserves to be elaborated. Alcoholism is one of the major afflictions usually listed among the sources of ill health whose treatment is a matter of will-power and not medical care. Many alcoholics, though, seem to have some desire to be well but it is insufficient for the difficult regimen of breaking their addiction and refraining from drinking. However, should antabuse, a counter-drug given in small (less than 0.5g) dosages prove safe, it might help many alcoholics because it requires much less will-power to take this medication regularly than to refrain from drinking. To put it differently, antabuse, a medication, "strengthens" the will-power.

Antabuse has been used in the treatment of alcoholism because it produces quite unpleasant physiological effects if alcohol is also consumed. Soon after ingesting the alcohol an individual who has taken antabuse may experience a burning sensation in the face and neck, a severe headache, and, often, a feeling of faintness leading to vomiting. In the words of the physician who first detected the effects, Dr Erik Jacobsen, "The discomfort is so intense that, once experienced, it prevents an overwhelming majority of patients from further attempts to take alcohol as long as they are influenced by antabuse."8

The drug is not without danger. The danger posed by ingestion of the drug itself has been said to be minimal and may possibly be entirely eliminated if the dosage is reduced. But the danger from the reaction when alcohol is consumed is more considerable, and severe reactions may result in convulsions and require hospital attention. A small number of deaths have been recorded when larger dosages were used.

Similarly, efforts to curb unwanted pregnancies would largely be helped if means other than those requiring an
Impact

intervention before each intercourse (condom, diaphragm) regular intake (the Pill), or one which is anxiety-producing and difficult to reverse, and requires medical intervention (sterilization and vasectomy) were developed. The desired new procedure should be easily reversible, need only one intervention until reversal is required, and involve no pain and no anxiety (the intrauterine device used to be considered a fair approximation). With a given level of will-power, such a technique would provide a means of preventing unwanted pregnancies superior to any other.

In all, it is much easier to combat cholesterol via medication than via dieting; overweight via appetite-controlling drugs, etc.

To generalize, medical research and care can and should make compliance easier. Rather than rely on will-power, the medical profession should be aware that the larger the requirements the medical regimen sets, the less likely health enhancement will result.

Most importantly, while there is a significant individual element involved, a very high proportion of both the temptation to act unhealthily and the capacity to resist, or, to put it positively, to act healthily, is not individually but socially determined.

On the side of the lure is first the obvious element of the availability of unhealthy substances. Thus, studies of alcoholism suggest a high correlation between certain cultural patterns and alcoholism.

A survey examining the role of environmental variables related to alcoholism concluded, "An individual who is a member of a culture in which there is both pressure to drink and culturally induced guilt and confusion regarding what kinds of drinking behavior are appropriate, is more likely to develop trouble than will most other persons." A

Next are the direct social stimuli to unhealthy acts. Thus, it verges on the irrational to call on the citizens to follow wise diets while so many of the messages which reach them from television and radio advertisements, billboards, packages, from childhood on are to consume starchy, or calorie-rich, foods, frozen meals, or liquor, cigarettes, etc. The situation reminds us of a silly definition of
the epitome of "cheek": you push your mother-in-law down the staircase and ask her why she is running so fast.

Behind these direct factors, there are deeper social factors which shape to a large extent both the level of temptation and the capacity to resist. These concern chiefly the nature of the societal project and the extent to which it is responsive to the citizens' underlying needs. Each society may be viewed as organized chiefly for one purpose. Thus, in the crusaders' day, medieval societies might be said to have seen in holy wars their prime project; traditional China had a great interest in cultural products; Athens, in public affairs. Our society's main project is the production and consumption of goods. This is what most of its time, resources, and attention are spent on. Activities linked to this project are most valued and successful and highly rewarded. No wonder the leaders of a major corporation earn much more than a top politician, leading scientist, or top hospital administrator.

Before we ask if the project is or is not satisfying, its "work" requirements are widely believed to be demanding. It requires long and hard work; it requires considerable self-discipline and competitive behaviour. It is widely held that those most involved in its production end are prone to a large variety of illnesses such as ulcers and heart attacks, and as women enter more into the labour market and higher ranks of the industrial system, they too are "catching up" with men.

Another significant source of illness is the process of work. Thus, the US National Safety Council reports that 14,000 deaths on the job and 5.9 million injuries occur annually.\(^\text{11}\) The Occupational Health and Safety Act of 1970, passed overwhelmingly by Congress, has been under attack by labour groups for failing to provide the worker with the protection promised in the legislation. A study prepared by the Department of Labor Subcommittee revealed that: 96% of all covered employees had not experienced an inspection by the Occupational Health and Safety Administration during the Act's first three years of existence.\(^\text{11}\) Although steps have been taken to provide adequate staffing for inspections and the promulgation of standards, it seems that the Occupational Health and Safety Act affords inadequate protection as regards the problems of death and injuries on the job.
The automobile is the main killer of those aged 15-24 years, and a major killer for all age groups. Although those between the ages of 15 and 24 years are extremely healthy when compared with people of other ages, the probability of death for persons in this age category, particularly males, is high. Accidents, especially motor accidents, constitute the most frequent cause of death among males in this age group, and it has been predicted that 1100 out of every 100 000 males in the USA will die from a motor accident. Using for comparative purposes the incidence of death due to polio when that disease was at its worst, the death rate due to motor accidents is twenty times as high.\(^1\) By the time a white male in America reaches the age of 35, his chances of dying in a motor accident are reduced by one half, but for non-white males the chances remain high, with nearly 800 out of every 100 000 likely to die from such accidents.\(^1\)

While it used to be widely held that it is the driver's unwise driving which is the main cause of accidents, Ralph Nader's book, Unsafe at Any Speed, and scores of studies have shown that automobile and road design are at least a major source of the problem.

It might be said that the person as a buyer is at fault, if not as a driver, because he prefers stylish over safe cars. But the industry has gone a long way to taboo safety as a feature of advertisements, while stressing style.

In other areas, it is impossible for the buyer not equipped with a high-power laboratory to determine what he or she is buying. Take, for instance, the case of Red Dye No.2. The dye, in wide use at least since 1960, had never been permanently approved by the US Food and Drug Administration (FDA) owing to unresolved safety questions. As a result of a review by the FDA's National Center for Toxical Research which, near the end of 1975, concluded that there was a "statistically significant increase in a variety of malignant neoplasms (cancerous tumours) among tested rats", the dye was banned. It was only by means of a sophisticated biostatistical analysis that Red Dye No.2 was found to be a possible cancer-causing agent.\(^1,2\) Moreover, a person purchasing an ice cream cone has no way of knowing whether or not it contains Red Dye No.2, or any other. Typically, until the government intervened, there was little the citizen could do.
Now, on the will side - how "strong" individuals are, how wisely they act, is to a significant extent dependent on the social structure. This is widely recognized even in matters of political freedoms and other liberties. People are able to resist government if they live in "organic" communities, are bound in voluntary associations, and otherwise into the social fabric. No one is considered more vulnerable to government tyranny than isolated, "atomized" individuals.

The same holds for wise versus unwise health practices. The mass society opens people to mass appeals, fashion, fads, and ads. It is not that those in organic communities will necessarily follow wise health policies; they depend largely on what patterns the communities approve and disapprove. However, such individuals are much more likely to have the strength of character needed to overcome or resist addiction, consume wisely, etc., than atomized persons.

All this is not to suggest that the individual has no degree of freedom at all or no personal responsibility. The ultimate decision is up to each individual and he is morally responsible for it. However, the main point of the preceding analysis is to emphasize the importance of societal factors in setting both health hazards and ill-health temptations and in shaping the ability of the individual to cope with them.
References


2. Although the relationship between income and infant mortality has weakened in developed countries, those families with incomes below a minimum level of $3000 do have a higher rate of infant mortality. A 1972 study showed that, as family incomes increased into the $5000 - $7000 range, the infant mortality rate diminished significantly and, for incomes above this range, there was no further decline. See: NATIONAL CENTER FOR HEALTH STATISTICS. Infant mortality rates: socioeconomic factors. Rockville, MD, Department of Health, Education, and Welfare, 1972 (Series 22, No.14).


7. Dr Hilde Bruche, author of several books and articles on the problems of weight and eating disorders, writes that many dieters "clamor for quick reduction" and, because they are often disappointed when their high aspirations are not fulfilled, they enter into the cycles of "drastic losses and rapid regaining". "'Dieting' to such patients ... becomes a magical tool that will bring fulfillment of impossible aspirations. Without a corrective reappraisal of their fantastically high aspirations they are bound to be disappointed and will regain the painfully lost weight". BRUCHE, H. The psychology of obesity. Medical Opinion, August 1973, p.39.

9. Dr John J. Canary, Professor of Medicine at Georgetown University School of Medicine and a veteran of more than twenty years of research in metabolism and body composition, states that appetite-suppressants and other pharmacological aids to weight reduction can be helpful, especially if used on a limited basis for those who have "a serious problem of sticking to a diet on a short-term basis". CANARY, J.J. Do we dare differentiate between obese and overweight? Medical Opinion, August 1973, p.22.


One can look at the impact of ill health and disease on the social structure and economy of a community in a number of ways. I would prefer to examine this subject on the basis of the WHO definition of positive health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

Disease as a biological process in the human body affects the whole organism, including the mind. For the individual or for society disease is not only a biological process but also an experience which may well be one that affects the entire life of the person or of the nation.

Our experience in developing countries is very depressing. There is disease everywhere. We see disease in water, in our houses, in the food we eat, in some of our social activities: we are borne and breast-fed by sick mothers, and if we survive the early years we continue to survive in disease.

My discussion will take a very general pattern, mainly illustrating how ill health and disease do affect the social structure and economy, with special reference to East Africa, where I was born and reared. Since such experiences seldom find their way into the more formalized medical and scientific media, it is at a forum such as this that they should be discussed in order to reflect on the educational system of medicine.

I now wish to refer to the sad subject of social calamities. I would illustrate this by examples from our experience. In November 1975 the UNESCO Regional Office of Science and Technology for Africa organized a sub-regional workshop among countries of eastern and southern Africa (Botswana, Burundi, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Rwanda, Somalia, Swaziland, Tanzania, Uganda and Zambia) to consider in general terms problems of common interest.

Hunger was identified as one of the most important and worsening problems affecting the people of our sub-region and the world. We also identified five other
problems of common interest in the sub-region, namely food shortages, energy shortages, water shortages, housing shortages, and severe shortages in scientific and technological manpower. One other basic problem we identified was the relative inadequacy of communication facilities.

These are social ills, some of which have had serious consequences. It is a truism that if the minimum of food required for man to replace the energy he expends is unavailable, his resistance to disease is lessened; and prolonged starvation leads to death.

The history of famine is a very sad chapter in man's history. Africa could produce much more food than her inhabitants require - if the present improved methods of agriculture and means of communication were available to her. In theory, therefore, there is no justification and no excuse for the famines and the consequent depressing morbidity and mortality so rampant in our daily life. Because such events continue to overwhelm us it shows that civilization in the world has somewhere collapsed.

Often, I must admit, as medical authorities we are fully aware of the situation but we do not have the authority or power to effect the necessary administrative action among those directly responsible. This is one of the challenges of medical education in the future.

Hunger and famines lead to social disturbances and disruption. There is disruption of families and children grow up without guidance.

Famine, hunger and starvation provide fertile ground for many diseases. Life is disorganized and people's living conditions are worsened. Epidemics of diseases such as cholera and dysentery have become things of the past in the developed countries where once they were rife; but they are still with us in the less developed countries today. Famines and epidemics set up waves of confusion. They set groups of people in motion, spreading disease and engaging in tribal wars and all sorts of criminal activities.

I wish to illustrate further the economic impact of disease on the international scene. An article entitled "Smallpox eradication in West and Central Africa" published in the Bulletin of the World Health Organization in 1975
Under the heading Programme costs it is reported that "although the USA has not had a case of smallpox since 1949, a study in 1968 revealed that more than US$140 million a year was being spent in that country in order to maintain its smallpox-free status. This study emphasized that the most appropriate investment to protect that status was to free the world of smallpox, thereby reducing future domestic expenditure on the disease.

"In all, the USA invested approximately $15 million in smallpox eradication activities in the West and Central African Programme. Thus diversion of $15 million - what the USA would ordinarily spend in 39 days to remain smallpox-free - allowed 20 countries in the programme area to become smallpox-free. In consequence, these countries constitute no future risk as exporters of smallpox."

The problem therefore is that of keeping disease not only down in a community but also out of it when it no longer exists there.

In East Africa, the major causes of morbidity and mortality include:

1. acute infectious diseases, especially in childhood
2. malnutrition, again especially in childhood
3. malaria
4. schistosomiasis (bilharziasis)
5. filariasis
6. trypanosomiasis
7. tuberculosis
8. leprosy.

Some of the common social and economic factors relating to these conditions can be summarized as follows: because of the high mortality from causes 1, 2, and 3 above, especially in childhood, family planning is not easily accepted. Cause 6, trypanosomiasis, is responsible for serious disruption because people have in some cases to be resettled some distance from areas infested by the tsetse fly; this disease has economic effects on man's domestic animals. Leprosy (cause 8) carries a stigma in some populations and not at all in others. The influence of schistosomiasis (cause 4) on working capacity has been demonstrated by Hunter et al.2 and in East Africa by Fenwick in Tanzania3 and by Siongok et al. in Kenya.4 Munube
in his work on an outbreak of type 1 paralytic poliomyelitis\textsuperscript{5} observed that "in Kampala City and Mengo Districts of Uganda a combination of ignorance, fear, suspicion and politics made acceptance of polio vaccination difficult indeed, and this paper describes a well-investigated poliovirus I epidemic which occurred in these areas during 1969, leaving behind several hundred children as cripples and creating more headaches for health authorities and the society at large".

There is another serious impact that ill health and disease have on our situation in the developing world. This is the unfortunate emphasis on ill health and disease as against the prevention of disease and the promotion of positive health. Health authorities have continued to invest heavily in the management of disease and ill health. This has had the adverse consequence of causing communities that need health promotion as a priority to be disease oriented and tend to concentrate on the disease situation. While concern for disease management and treatment may be justified, we have an equal duty ethically to identify possible health risks and protect against them. An unfortunate consequence of the emphasis on curative medicine has been the lamentable imbalance in the allocation of resources. This has had the following consequences:

1. special care for the well-to-do;
2. the urban versus rural conflict, the lucrative life of the town attracting most of our doctors, so that the differences between the physician/population ratios in the two areas are very significant;
3. although large and often monumental hospitals are to be found, these are only in the large towns.

I should point out that such situations are not limited to the developing areas of the world.

Professor Etzioni in his introductory paper discussed some challenging situations. But I wish to emphasize the point about resource inputs and the improvement in health care. He has hit the nail on the head. Because this is the cry of the developing countries, I wish to echo him. The raising of the economic, social, and cultural levels of a people is the major recognized factor in the decline of disease. While medicine has certainly played a part, this has often been only supplementary. The message that
I am trying to convey, therefore, is that the application of existing knowledge of the control of the major communicable diseases demands a corresponding social and economic progress. Medical measures are usually only palliative and only reduce the burden of disease and have often to be continued indefinitely until the sources of the evil are struck and eliminated. In our circumstances these include ignorance and poverty apart from disease.

May I end by suggesting some solutions based on experience of developing areas:

1. There is a need to reorient medical education with particular emphasis on preventive medicine.

2. More attention should be directed to scientific research, both mission-oriented and non-oriented. Particular emphasis should be laid on research into the prevention of endemic diseases.

3. There is a need today to internationalize public health training and the public health curriculum. This is important in the light of the increased volume of rapid, worldwide travel, which has multiplied opportunities for human contact and thus for the transport of communicable disease.
References


THE IMPACT OF ILL HEALTH AND DISEASE ON SOCIETY
WITH SPECIAL REFERENCE TO BRAZIL

M. Belchior

The paper by Dr Etzioni and Dr Salasin covered very well what we can consider as the impact of ill health and disease on society.

At the present time we all know that social progress can only be built upon good health. And if we consider that health, in the definition of the World Health Organization, is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity, only a nation of healthy people can guarantee a desired quality of life.

Dr Marc Lalonde, the Minister of Health and Welfare of Canada, said in his paper - A New Perspective on the Health of Canadians¹ - that the Government of Canada "intends to give to human biology, the environment, and life style as much attention as it has to the financing of the health care organisation so that all four avenues to improved health are pursued with equal vigor". He also said that the goal of the Government should be not only to add years to life but life to years, so that all can enjoy the opportunities offered by increased economic and social justice.

There is a traditional, generally accepted view that all improvements in health come from curative medicine, or individual health care. And so, much of the public money is spent in medical and hospital care. Dr Thomas McKeown, Professor of Social Medicine at the University of Birmingham Medical School, reviewing the level of health in England and Wales back to the eighteenth century² concluded "that in order of importance the major contributions to improvement in health in England and Wales were from limitation of family size (a behavioural change) increase in food supplies and a healthier physical environment (environmental influences) and specific preventive and therapeutic measures", and that "Past improvement has been due mainly to modification of behaviour and changes in the environment and it is to these same influences that we must look particularly for further advance".
Dr Lalonde studying Canadian statistics concludes that "economic circumstances, health education attitudes and facility of physical access to health care, as well as improved pre-natal care, are the principal factors to be considered in lowering the rate of infant mortality".

You may be interested to know that in Canada the principal cause of death from ages 5 to 35 is motor vehicle accidents, the second most important cause is other accidents, and the third is suicide. We can conclude that, all these causes being due to human factors, changes in these factors are essential.

We must look at the effect of all the known risks and their impact on society. Alcohol, for example, is an important factor if we consider different consequences of this habit, such as cirrhosis of the liver, poor nutrition, and traffic accidents. Cigarette smoking is another cause of many serious diseases, leading to incapacitating disease and death, and yet we are still unable to impress these facts upon the general public.

I think it was very appropriate to consider the health needs of society as a challenge for medical education, for nothing can really be accomplished if we do not involve the medical schools in this kind of study. The practice of medicine today is closely related to sociological factors. Henry Sigerist conceived the four functions of medicine as including the promotion of health, the prevention of illness, the restoration of the sick, and rehabilitation.

In 1960 he described each of these in turn: "The first task, and one of the most important today, is the promotion of health. Health cannot be taken for granted. It must be maintained and promoted through incessant activities in which the physician shares with a great many other workers. Education, general education and health education, represents the starting point of all health activities, and the school undoubtedly is one of the most important public health institutions.

"Health is promoted, furthermore, by our developing a program of physical culture that must reach all groups of the population and all age groups. Physical education does not consist of competitive and commercialized athletics but is primarily an attitude towards health, the creation and satisfaction of a need for organized physical exercise
Brazil

that will benefit the general condition of an individual's health."

The physician must consider the social aspect of the doctor-patient relationship. The patient must be treated as a human being and be intelligently informed how to participate in the treatment of his case.

In 1946 Sigerist proposed a new type of medical school. He thought that while needing more than ever - a scientific physician well trained in laboratory and clinical work, we also needed a social physician who, conscious of social development and of the social functions of medicine, would consider himself at the service of society. There was no point, he considered, in training doctors primarily for city practice among the upper middle class.

He thought that the medical school should be oriented towards producing graduates who would consider medicine to be a service rather than a competitive business, who would serve above all the low-income groups who needed their services most, who would be trained in teamwork and a spirit of cooperation to prepare them for group practice organized around a health centre, who would practice preventive medicine, and who would become interested in health and not only in disease.

In addition, he said that every case should be analysed medically and socially to find the causative factors that have made it possible, and conclusions should be drawn on how to prevent similar cases in the future. For the good of society, the training of auxiliary medical personnel must be as important as the training of physicians. The social physician must protect the people and know how to offer them a better life.

Now, I would like to present some information about Brazil in relation to the topic of this discussion.

1. The care of mother and child

Mothers and children represent 70% of the population and deserve high priority in the government's plans. The impact of disease in this group has to be considered as one of great consequence in every respect. The infant mortality rate varies from 229 per 1000 to 478 per 1000. The Brazilian population is about 110 000 000 with a demographic density of 12 people per km². In this group we
have high rates of mortality and morbidity, a high number of deaths under one year of age in relation to the total number of deaths, a high number of deaths under 4 years of age, and a great number of deaths due to causes that should be avoided.

Sanitation plays an important role. In 1974, out of 3953 municipalities, 68% did not have a good water system and 86% did not have a sewage system. This situation is closely related to the high infant mortality. The improvement of health conditions for mothers and children will have a decisive influence on the general health condition of the country, particularly in view of the role of women in the country's labour force.

2. Chagas' disease

This is one of the most serious public health problems in Brazil. It is estimated that there are 7 million cases. This disease is closely related to the economic development of the country, since it incapacitates a great many members of the labour force. It is easy to realize the impact of this disease on society.

3. Schistosomiasis

This is a typical example of a disease that depends to a great extent on a good programme of sanitation for its possible eradication. The country's development through new roads, irrigation, and colonization provides conditions favourable to the spread of the disease. Another important source of the spread of the disease is labour migration in the country.

4. Malaria

Here is an important example of the impact of disease on society. The progress of the malaria eradication programme has been extraordinary, if we compare the 8 million cases in 1954 with the 71,400 today. We can see how many people were enabled to join the country's labour force.

It is very well recognized that every citizen has the right to health, and that this right should be protected by the Government. Henry Sigerist said that the purpose
of the State is to protect people's property, but that most people, however, possess nothing but their labour power, which depends entirely on their health. This is their only property and the State, therefore, has the duty to protect it and the people have the right to insist that their health, their only possession, be protected by the State.

The State delegates to doctors the task of protecting the health of the citizens. And they must always realize their great responsibility. Students must be trained to recognize what they will encounter in everyday practice.

We must ask the medical schools to teach students how to be family doctors - how to help patients facing the impact of disease so that they can enjoy as happy and rewarding a life as possible.
References


SESSION III

IMPLICATIONS OF HEALTH AND DISEASE FOR THE RESPONSIBILITIES OF THE MEDICAL PROFESSION

B. Rexed

Background

Modern society is subdivided into highly specialized sectors, each with its own well-defined responsibility. Owing to the very specialized function of each of them and their limited responsibility for the total societal situation, there is strong interdependence between their services. In this total make-up, the health delivery system is thought to be responsible for the health of the citizens. This is a serious misjudgement. The responsibility for keeping people healthy rests with the society as a whole. The need for medical care is the end result of a chain of effects which depend on the life situation of the individual and the whole structure and function of society.

The health needs of a population can be defined and quantitatively estimated through various kinds of studies and investigations. Obviously the structure and direction of the health delivery system should aim at filling these needs as far as the resources devoted by society to medical care and prevention permit. Because of the changing material and cultural development of the population, the health situation is changing continually, and the health delivery system will have to adapt its services to new situations. Progress in research and the introduction of new medical technology also produce new possibilities for the functioning of the health delivery system. If we want to change the output of the health delivery system either qualitatively or quantitatively, we will have to effect the change through new types of training for medical manpower. Such a task must be based on an educational strategy.
The responsibilities and obligations of the medical profession must be discussed within these general perspectives under a number of headings.

Prevention

A general preventive effort must involve society at large. Medical and social causes in the widest sense often interact intimately in the etiology of different diseases and conditions of illness. Falling ill is often the result of a long series of damaging life factors working on the individual in different forms over a long time. We must look at this situation in a way that might be called medical ecology. Illness produced by too low income for subsistence, bad living conditions, or unsatisfactory nutrition cannot of course be remedied by medical care. More concrete examples of health hazards that can only be dealt with through large-scale social interventions are tobacco and alcohol consumption, chemical pollution of air and water, and unrestricted motor traffic.

The responsibility of the medical profession in the field of general prevention must be to collect the experience and knowledge obtained in the operation of the health delivery system, and to define and point out such negative mechanisms as are the true causes of disease, so that they can be eliminated. The medical profession hitherto has taken little part in this work. Evidently medical education has been too much focused on a limited curative function. There is a great need to broaden medical education to take in the social sciences and to increase the political awareness of the medical profession.

The field of individual prevention is perhaps the area in which the medical profession has best been able to shoulder its responsibility. The biological and medical history of disease explains in a clear and concrete way to the physician how he can help the individual to protect himself against infectious diseases and malnutrition, through maternal and child health guidance or by encouraging a better working environment. Here the problem is rather that the medical profession has not shown enough understanding of the need to intensify such efforts through effective and integrated preventive and curative action in primary medical care and in the field of community health service. The physician must acquire a better understanding of his role as a leader and consultant in a field team, which can reach everybody in the area where the physician has an overall responsibility for health and medical care.
An important part of individual prevention has to do with health education. Unless the individual himself knows of damaging life factors and has an understanding of a positive way of life, the physician and the medical care service cannot protect his health. Even though physicians may verbally subscribe to the principles of health education, many of them are too engrossed in their daily curative work to put an emphasis on supporting health education in their particular field. Many of them are also over-critical and ask for such strong positive evidence to back every piece of health advice that they undermine the efforts of the health educators. The debate on proper eating and on the effects of tobacco-smoking offers evidence for this. There is a great need to give the medical profession a better understanding of the basic necessity of broad and intensive health education, utilizing the cooperation of voluntary forces in the society concerned. The wholehearted support of the medical profession is needed if this work is to be successful.

Curative medicine

In recent years most discussions about health delivery in different countries have centred on the cost increases incurred by vast, complicated, and super-specialized systems. However, the problem is not to curb this development by putting an economic limit to it, but rather to examine the priorities for expansion so as to adapt it better to the health needs of the population. Here, it seems evident to many that these systems in all countries and especially in the developed ones have tended towards overspecialization and towards overexpansion of the hospital system, whereas many circumstances point to the need for giving priority to the development of primary medical care. An expansion of primary health care is needed to give better access to the medical care delivery system in time of trouble, to provide continuing contact with the system for individuals and families, to deal with relatively neglected areas such as prevention, alcoholism, drug dependence, mental health, and health education, to intensify the supervision and management of the health aspects of chronic disabilities in the mentally ill, the chronically ill, and the elderly, and to create the necessary liaison with other social agencies and services concerned with welfare, housing, rehabilitation, and social security.

The medical profession has shown little understanding of this need or of the special function of primary medical care in accepting the responsibilities of community health and community care. The education of the physician is too much centred on the specialized diagnosis and therapy of disease,
and most medical training is given in super-specialized hospital surroundings. To increase the physician's understanding of the importance of such services to the individual and of the social responsibility of the medical profession in building them up, it is necessary to readjust medical education so as to include training and service periods in primary medical care. In the continuing education of all physicians a new understanding must be achieved of the balance between primary medical care and specialized medicine, and of the functioning of all physicians in coordination with well-organized ambulatory medical care. It is the responsibility of the medical profession to make the politicians understand the outline of this new health care strategy and actively to help in restructuring the health delivery systems.

The self-care of individuals is an important factor in keeping people healthy. As a society develops and a complex medical care system is built up, there is a tendency for individuals to seek medical contact and advice not only for illness and threatening medical symptoms but for all kinds of minor complaints and disturbances, not least in the mental area. Even if it is difficult to say where the separation occurs between necessary and unnecessary medical consultation, there is a widespread feeling among physicians that many of the complaints taken to the doctor might have been taken care of at home, if the individual could have relied on his own knowledge and experience. There is a tendency towards the medicalization of life.

It is evident that the medical profession has not sufficiently considered the possibility of supporting the practice of self-care. Health education obviously is one of the requirements. But the medical profession itself is responsible for a lessened degree of self-care and for overmedicalization. The legal overconsumption of drugs is one example of this. The frequent institution of unnecessary treatment and consultation is another factor. The medical profession must adopt a more self-critical attitude and scrutinize its own behaviour. Instead of making people more and more dependent on professional medical contact, the medical profession must support the will and the knowledge to increase self-care in each society. One way is, of course, direct advice and support of health education. Another way is through a conscious effort to use the whole medical care team, including pharmaceutical personnel, to support
Responsibilities

and build up the possibility of self-care in the society concerned.

Research

The direction of medical research is probably not well adapted to the present situation and overall health needs in our societies. The overemphasis on super-specialization and on the hospital system has also had the effect of directing medical research to too large an extent towards the solution of problems relevant to this kind of development. Obviously there is a need for more basic knowledge. But what is especially needed at present is a greater volume of applied research. Are the researchers really interested in taking up problems of low-income social groups such as low back pain and walking difficulties? How much interest is there in making the effort needed to give a large number of elderly people safe and medically satisfactory care in well-run long-term nursing homes? What resources are devoted to the development of simple methods for daily work in primary medical care? More work is needed practically everywhere for the development and application of methods of epidemiology for the definition of health needs. Only limited resources are devoted to the development of quality control in the health delivery system or to a scrutiny of its functioning, organization, and results.

The medical profession as a whole has been too much occupied with fundamental biomedical research to stimulate medical research on problems that may be common but are far from trivial. It must be the responsibility of the medical profession to evaluate their daily work from the point of view of defining needs for better diagnostic methods and improved treatment of manifest and large-scale medical problems among their patients. Discussion on such subjects in the journals of medical associations must be encouraged. The integration of research organizations in university medical hospitals with clinical staff responsible for medical care should help this redirection of research. But it will then be necessary for the university medical staff also to take responsibility and engage in teaching and training activities in long-term medical care and in primary medical care.

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Does the medical profession facilitate change? The answer to this question depends on what goals one sets and what priorities one believes to be the best for the future.

The goals suggested by this presentation could be summed up as follows. In its specialized sector of society, the health delivery system should be more accessible and more decentralized and it should look more to people's total situation, be more community-centred. Health conditions should be studied closely, and the relevant information concerning causes of disease should be assembled and communicated to the politicians. However, to safeguard the health of people in a more general way measures of other kinds are necessary. Here it is a question of changing people's whole life situation. In every country it will be necessary to make changes in the structure of society, to change the life situation of low-income groups, to help eliminate differences in social class through an expanded educational system, to create a better physical environment, to diminish the pressures of an increasingly competitive society.

In such a perspective the medical profession could do more to facilitate change, but, for this, it would have to examine its position on two levels. First, it must understand that the medical profession and the medical care system constitute only one factor and operate in only one sector of society in their work for health. In general prevention, i.e., in bettering the quality of life, the medical profession must act together with the politicians, stimulating them by giving them information on living conditions and the health support required. The medical profession must acquire better social understanding and accept greater social responsibility.

Secondly, the medical profession must understand that they are only one group of professionals inside the medical care system. They must accept that in the future this system can no longer function as a hierarchy, in which the physician gives the orders and is the only one who can do important work. In all disciplines of the hospital, and especially in primary medical care, the physician must come to look upon himself as just one of the professionals on a medical team, sometimes (maybe often) the leader but also a collaborator with others on an equal footing. Sometimes he is only a consultant to somebody else who has to do the real work in an institution or in the field. This change of attitude will foster a new spirit of collaboration in the health delivery system and will increase the efficiency and social impact of the work.
Finally, let us in all sincerity agree that the medical profession has always been an agent of change. The important thing for the future is to find ways and means of keeping this old and venerable profession in the mainstream of social change.
THE PLACE OF PREVENTION IN MEETING THE HEALTH NEEDS OF SOCIETY

J.H. Bryant

Introduction

Medical educators need to see the importance of an intimate inter-relationship between their educational programmes and the health sector in which graduates of their programmes will work. The relationship is one of mutual dependence. On the one hand, no matter what the content of the curricula or how much emphasis is placed on preventive services, truly comprehensive health care will not become a reality unless there is a corresponding change in institutional and national policies towards prevention. On the other hand, any change in policy toward the provision of preventive services will have little effect unless it takes into account the changes in educational programmes and the research-derived knowledge base that underlies the programmes that will be needed to produce providers with a preventive orientation. Thus, consideration of the education of health personnel for prevention must include both the educational and health care sectors, and a search for avenues of improvement must look for problems and opportunities in both sectors.

This paper opens with general comments about the need for changing approaches to prevention as patterns of disease change, and then proceeds to ask: What is prevention? Who does it? Where is it done? How can we analyse the effectiveness of health personnel in order to plan for more effective education for prevention? The point is then made that the key persons in the preventive effort are at the primary care level, and the paper discusses the role of primary care physicians, including attempts to describe what primary care is and how health care settings can be analysed for their effectiveness in providing primary care. Finally, the implications of these observations for the medical profession and medical educators are discussed.

Historical trends and current realities of prevention

Historically, prevention evolved from the need to deal effectively with transmissible diseases and began with methods for cleansing the environment and protecting the individual. These approaches are still very important, particularly in less developed countries. But changing levels of development,
particularly as regards socio-economic conditions, the environment, and the age composition of the population, have led to changing patterns of disease. These new patterns require new methods of prevention. The factors contributing to the leading causes of death and disability in the more developed countries are multiple; the causal agents may be identifiable but, as with venereal diseases and traffic accidents, it is difficult to find points of vulnerability for preventive action. Or there are multiple causative factors, as with coronary heart disease and lung and gastric cancer, and approaches to prevention must embrace a range of ecological factors.

Winkelstein points out that gastric cancer is declining in the USA as a whole, but not in all sections of the population; in lower socio-economic groups, particularly those living in industrial settings, the incidence of the disease is higher. Evidence suggests that large soot particles may play a causative role. The point is that social, economic, and geographical conditions figure in disease causation and must be taken into account in developing preventive strategies.

Relationships between personal behaviour and health provide another example of the complex etiology of disease. The studies of Belloc and Breslow show that good habits of living are associated with better health status and lower mortality. They identified several habits of good living, those having to do with hours of sleep, regularity of meals, exercise, and abstinence or moderation with respect to smoking and drinking, and observed a striking inverse relationship between these practices of living and mortality. For men, the average life expectancy at age 45 years was 11 years greater for those who followed six or seven good health practices than for those who followed four or less. The difference in women was seven years. While it is notoriously difficult to influence life styles, these studies make it clear that it is important to develop the means to do so and suggest that preventive approaches should be from the broad perspective of the individual, the family, and the community.

Prevention and the education of health manpower

In the USA concern over the place of prevention and the possible need to develop a national strategy led the Fogarty International Center for Advanced Study in Health Sciences and the American College of Preventive Medicine.
to convene, during 1974-75, a series of eight task forces on various aspects of prevention. One of the task forces focused on the education of health manpower for prevention, and some of the questions and concepts that emerged are relevant to this Round Table.

The task force began by asking: Who should be responsible for prevention? They concluded that all categories of health manpower, plus policy makers and the public, should be involved in prevention in its broadest sense. With respect to health manpower the focus should not be primarily on specialists in preventive medicine nor even mainly on physicians but on the broad range of health personnel.

Next, the question was asked: In what settings can preventive intervention occur? The answer was, in a great variety of settings, including:

- Federal Agencies (Center for Disease Control, Food and Drug Administration)
- Hospitals (community hospitals, referral hospitals, specialty hospitals)
- State and local health departments
- Health centres/satellite clinics
- Private offices (solo or group practices)
- Mobile units (screening programmes)
- Schools
- Places of work (offices, factories, institutions)
- Places of leisure activity (clubs, community centres, etc.)
- Home.

What kinds of activities constitute preventive health care? The scope of prevention includes health promotion, disease prevention, early diagnosis and treatment, and rehabilitation.

The task force saw the need to go beyond these generalizations in order to probe at some of the shortcomings of current approaches to the education and functions of health manpower in prevention. They developed several "diagnostic tools" that helped to direct and develop their thinking.
One of these tools was a three-dimensional matrix of the preventive health care system, showing (1) providers of preventive services, (2) preventive activities, and (3) the target populations for preventive intervention on the three axes (Fig. 1).

Using the matrix the following questions were asked:
1. What major preventive activities are these categories of health workers involved in?
2. What cells in the matrix reflect the bulk of these activities?
3. How adequate and appropriate are these activities?
4. What are the implications for education and training?

An example of extending the use of this matrix to clarify and identify problem areas and shortcomings in the education and function of health personnel is shown, involving pharmacists. The pharmacist currently plays
a very limited role as a provider of preventive services, although he has the potential for assuming a much more active part in this area. The easiest way to visualize this is to indicate on the provider/activity/target matrix both his current and potential levels of participation in key areas of preventive health. To illustrate (Table 1), given the following areas of concern:

1. venereal disease
2. family planning
3. drug abuse
4. cancer
5. malnutrition, and
6. hypertension

this is how the two matrices might look (placing a number from the list above in a cell of the matrix assumes that a significant number of practitioners at present take part in the relevant activity).

Table 1. Present and potential involvement of pharmacists in prevention in relation to selected health problems

<table>
<thead>
<tr>
<th>Activity</th>
<th>Individual</th>
<th>Target</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Present situation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early diagnosis and treatment</td>
<td>3,5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health education and promotion</td>
<td>1,3</td>
<td>3</td>
<td>1,3</td>
</tr>
<tr>
<td>Health protection</td>
<td>1,3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>B. Potential situation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early diagnosis and treatment</td>
<td>1,3,4,5,6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health education and promotion</td>
<td>1,2,3,4,5,6</td>
<td>3</td>
<td>1,2,3,4,5,6</td>
</tr>
<tr>
<td>Health protection</td>
<td>1,3,5</td>
<td></td>
<td>3,4</td>
</tr>
</tbody>
</table>
A second diagnostic tool was the tracer technique, used to trace preventive functions in selected categories of health workers with a particular interest in determining the reasons for the discrepancies between current practice and the desired level of professional performance. The following steps were involved:

1. The provider/activity/target matrix was used to identify the major activities and populations with which the workers were associated.

2. Adequacies and inadequacies of preventive practice were listed.

3. The list of inadequacies was examined for contributory factors including: policies that might inhibit personnel from pursuing preventive activities; structures in the health care system that might be obstacles to prevention; financing mechanisms that might discourage prevention, such as the failure to reimburse for preventive services; gaps in educational preparation of health personnel; and interrelationships among personnel that are not supportive of preventive functions.

4. These inadequacies and factors contributing to them were analysed in order to identify educational principles and relationships that would lead to improved professional practice.

Throughout this enquiry, the key issues were seen to be the need to specify the competencies required by health professionals in order to be effective in preventive efforts and to identify the educational methods and settings necessary for the development of these competencies.

Prevention and primary care physicians

Physicians have responsibilities for preventive medicine at many levels, as general practitioners, family practitioners, clinical specialists, specialists in preventive fields, etc. The task force took the position that the key personnel for preventive services are those functioning at the primary care level, and therefore special attention was given to primary care physicians.

One major concern was that many current training programmes pay lip service to the concept of prevention but do
not include substantive content relating to prevention; the programmes are predominantly clinical and curative in their orientation.

Given the many different views of primary care, it is appropriate to summarize what I consider to be a coherent and useful way of conceptualizing primary care, together with an approach to using the relevant concepts to analyse a health care setting in terms of its adequacy in providing primary care. Prevention is an integral part of primary care defined in this way.

Michael Stewart has written perceptively on the primary care problems of large urban hospitals, largely on the basis of his experience at Elmhurst Hospital, a large municipal hospital in New York City. He takes a systematic approach by, first, defining the parameters of primary care and, second, using these definitions as a basis for analysing the problems of primary care and recommending solutions in the urban hospital setting.

Three sets of parameters are used for primary care programme analysis:

- primary care functions (PCF)
- primary care areas (PCA)
- primary care objectives (PCO)

Primary care functions are five:
(1) First contact care
(2) Episodic care
(3) Continuing care
(4) General care
(5) Coordinated care.

Primary care areas also number five:
(1) Emergency services
(2) Walk-in services
(3) General care clinics
(4) Specialty and subspecialty clinics
(5) Home care.
Primary care objectives are also five in number:

(1) Health promotion
(2) Disease protection
(3) Screening and early detection
(4) Disability limitation
(5) Rehabilitation.

It should be noted that these primary care objectives are actually the major components of prevention, i.e. prevention is an integral part of primary care by this definition.

These three sets of parameters are brought together in a three-dimensional matrix (Fig. 2) as a conceptual starting point for analysing primary care problems. A series of two-dimensional matrices can be used for examining specific functions, areas, or objectives. For example, four clinical units or areas of ambulatory care at Elmhurst were examined in terms of primary care functions (Fig. 3). The unevenness of contributions to the primary care function is apparent. As in many urban out-patient departments, the primary care role is filled by the combined efforts of several clinics. It is necessary, therefore, for individual clinics to understand their specific contribution to overall primary care and, further, for the clinics to cover the full range of primary care collectively.

From an analysis of two clinics, the Walk-In Clinic and the General Medical Clinic, in terms of primary care objectives (health promotion, disease protection, screening and detection, disability limitation and rehabilitation), it is clear that disability limitation (curative care) is the main objective in both. This pattern of care is common in both voluntary and public hospitals, too little attention being paid to the whole range of objectives implied by the term primary care.

This approach to the analysis of primary care settings brings out the importance of educating physicians who understand primary care in its broadest sense, with an emphasis on the primary care objectives, which tend to be minimized in the face of costs, traditional modes of organizing ambulatory care, and the pressure to provide curative medical care.
<table>
<thead>
<tr>
<th></th>
<th>First-Contact Care</th>
<th>Episodic Care</th>
<th>Continuing Care</th>
<th>General Care</th>
<th>Coordinated Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PCF</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PCA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Unit</td>
<td>+</td>
<td>+/—</td>
<td>—</td>
<td>+/—</td>
<td>—</td>
</tr>
<tr>
<td>Walk-in Clinic</td>
<td>+</td>
<td>+</td>
<td>—</td>
<td>+</td>
<td>—</td>
</tr>
<tr>
<td>General Medical Clinic</td>
<td>—</td>
<td>—</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Home Care Program</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
The medical profession and medical educators

What are the responsibilities and obligations of the medical profession with respect to prevention?

- to pursue preventive action, wherever possible, with individuals, families, and communities
- to understand the broad range of factors that contribute to preventive intervention
- to incorporate prevention as a natural and integral part of health care, particularly at the primary care level, and not as something separate
- to appreciate how health personnel in general incorporate preventive functions into their practice patterns, as individuals or teams
- to understand the dominant role of the patient in making decisions that affect prevention, including those having to do with lifestyle
- to understand the highly influential role of the community and its culture on individual and family decisions relating to prevention.

Medical educators need to incorporate an understanding of these issues into educational programmes for physicians. Perhaps the greatest challenge is that of developing, or establishing links with, learning settings in which preventive activities are operational, especially those where faculty and students can learn from health personnel and patients who are actually involved in prevention. The development and management of such learning settings are crucial to education for prevention; without them the risk is that education for prevention will become still another didactic, largely ineffective classroom exercise.

A final question is, how broad are the responsibilities of the medical educator? When the health care system is not hospitable to an important function such as prevention, how far does the responsibility of the educator extend? Only to education? To trying to influence policy? To trying to change the health care system and make it more supportive of prevention? It is clear that just as the education of the student is only a small part of his or her professional life, the professional life of the educator should not be limited to education but should extend into the areas in which his students must function with competence.
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THE ROLE OF BIOMEDICAL RESEARCH

E.P. Cronkite

For years I have been on the fringe of direct medical educational activities and have been nearly totally immersed in basic and also some applied biomedical research primarily concerned with cell proliferation and the regulation of cell populations. If the findings could be extrapolated to human populations, perhaps I could make a worthy contribution to this conference. There is no doubt in my mind that today's expanding over-population is the root cause of many of the difficulties in delivering health care and is also basic to, but not the sole cause of, inability to correct the social, economic, and political causes of undernutrition, undereducation, and discrimination.

In recent years I have been a faculty member at the developing Health Service Center, State University of New York, Stony Brook, and have become involved in medical education. I have admired the concise, pertinent editorials that Professor Etzioni has written frequently in past years for Science, and Professor Gellhorn's avant-garde endeavours in medical education at home are legion. I have read and studied with great interest Professor Rexed's preprint summarizing his comments to this distinguished group. Whereas I do not find myself in disagreement about the needs of society, I am in part in disagreement as to how these needs can best be met in the health area.

The basic attitudes of man and his intellect have remained unchanged for decades, if not centuries. The major differences between now and let us say 200 years ago (in deference to the American Bicentennial) are the scientific and technological advances that have been made. Discovery in science, before this century, was to a great extent serendipitous, a matter of chance or, for those who prefer it, an act of God. Today there is a vast accumulation of knowledge that enables the scientist to phrase a question that is amenable to a scientific answer and then design the protocols, marshal the appropriate techniques from the wide spectrum available, and answer pertinent questions. However, serendipity has not yet disappeared from the scene. Perhaps a little history might help to set things in perspective.
Two hundred years ago medicine was primitive - purgatives, phlebotomies - and pathetically painful. Anaesthesia was grog, laudanum, thongs, and four strong men. Surgery was primarily amputation for gangrene, crushing, and war injuries. The skill of a surgeon was measured by the rapidity of the amputation. Ambroise Paré replaced the use of boiling oil and red-hot cautery to staunch the flow of blood from amputations by simple ligatures. Gunshot wounds were routinely treated with boiling oil to drive out the poisons. During one battle, Paré ran out of oil and applied simple lotions to wounds. Much to his surprise, the following day the wounded soldiers treated without boiling oil were comfortable and their wounds healed much better. Through this simple stroke of luck for mankind, Paré made a tremendous advance in the treatment of injuries.

Antoine-Laurent Lavoisier, through the quantitative application of chemical principles, destroyed the doctrine of phlogiston and established the elemental character of oxygen, earlier isolated by Priestley. In a few poignant phrases he outlined the simple facts of respiration; namely, the absorption of oxygen and the liberation of carbon dioxide by the lungs. He recognized the similarity between the respiration of living bodies and combustion. Lavoisier was a martyr of the French Revolution. La Grange stated, "It took but a moment to cut off that head, though 100 years, perhaps, will be required to produce another like it". Socio-economic political excesses were expressed then as they are still being expressed today. Why?

John Hunter was a poorly educated man who became an anatomist and one of the great founders of clinical research. He became interested in venereal disease and took some gonorrheal pus from a patient. With a lancet he punctured his own penis and rubbed in the pus. Unfortunately for Hunter, the patient also had syphilis, and Hunter described the classical development of chancre, secondary and late syphilis. This observation led him into the grave error of assuming that gonorrhea and syphilis were the same disease; an error that persisted in medicine for a century. A man of violent temper, he developed severe angina pectoris, related to his cardiovascular syphilis, and in 1793 while attending a meeting of the board at St. George's Hospital, at which he was led into a heated discussion, he developed severe angina and dropped dead. We were as cruel to each other then as many are still today. Why?
Matthew Dobson died in 1784. Earlier English physicians had commented on the fact that urine from diabetic patients tasted sweet. Dobson performed a series of studies on a patient with diabetes. He tasted the urine. It was sweet. He collected the urine and let it ferment. He noticed the bubbles and then smelled the vinegar. He tasted it; it was sour. He took 8 ounces of blood, let it clot, and tasted the colourless part; it was sweet. He fermented it; it became sour. He took 2 quarts of urine, evaporated it to dryness and obtained some granular material smelling like brown sugar which tasted sweet and acted like sugar when treated with vitriolic acid. He concluded that the loss of sugar in the urine was a major cause of the weight loss in diabetes. This was an excellent example of scientific method and logic - the instruments being smell and taste. These early scientific advancements demonstrated the role of serendipity in medical research and also the application of the experimental method and logic.

Thus one sees that in 1776 practice and research in medicine were a rough business, clouded in mysticism and based on faith and "what will be, will be". However, man's ingenuity, perspective, and intellect were beginning to crack the wall of faith and ignorance. Newtonian principles were beginning to be applied in the life sciences. As the hard sciences continued development, they would be applied quickly in biology and medicine. However, in clinical research it would be several decades before quantitative methods would supplant the basic senses of sight, touch, smell, taste, and sound. In days past it took a stout stomach to apply these senses to the satisfaction of intellectual curiosity and the advancement of clinical medicine in the service of mankind.

Today, or, rather, in the recent past, two serendipitous observations have led to major scientific discoveries. First, Fleming's observation on the effect of tears on bacterial culture resulted in the discovery of lysozyme which, in turn, led to its isolation and chemical characterization through the application of the most sophisticated of the modern tools of investigation - chemical analysis, X-ray diffraction, model construction, and computer analysis. The effect of moulds on bacterial culture had been observed intermittently by many a bacteriologist. Fleming saw its importance and, under the pressures of war, Florey and Fleming isolated penicillin and demonstrated its usefulness, its mass production being accomplished in the USA.
Antibiotics, polio vaccine, the synthesis of many endocrine products, clinical chemistry, the understanding of physiological principles, blood and blood products, and anaesthesia, have led to safer and better surgery and the control of many metabolic and infectious diseases. These gains on the curative side of medicine were not won easily. They were the result of the best of science and modern technology. More can be, and should be, expected by society.

On the curative side of medicine, at least in the USA, we are confronted with a paradox. The US National Academy of Sciences Halothane Study detected apparent differences in post-operative mortality amongst US hospitals. Moses & Mosteller stated in 1968, "In summary, real and important differences in death rates do exist. They are not explainable statistically. Explanation will have to rest on medical-social-biologic procedural information. Getting the relevant understanding will be difficult".

In 1976 the reasons for the disparate surgical results are still not known, but the methodology for getting the answers has now been developed and can be incorporated into medical records and patient care evaluation systems.

I could not disagree with Professor Rexed when he said that "the responsibility for keeping people healthy rests with society as a whole"; or, in the words of G.L. Spaeth, "we can realize that how we live largely determines what we become and how we shall die". It has always been a paradox to me that some physicians who realize the hazards of alcohol, drugs, and cigarette-smoking, are amongst the worst abusers in the whole of society. Why? I should like Professor Rexed to be more specific on what type of social intervention will eliminate the abuse of alcohol and tobacco. Specific knowledge does not prevent abuse on the part of a fraction of physicians. Somehow most human beings seem inclined to risk their lives and endanger their health for pleasure and many another poorly defined reason. In fact, the persons totally concerned about their life and health seem to be relatively ineffective in addressing human needs.

The chemical pollution of air and water is admittedly amenable to political and economic decisions based on risk/benefit concepts. In the realm of prevention, the medical profession need take no back seat. Ability to understand enteric and many infectious diseases and to prevent them through sanitation, vaccination, and the control of disease vectors is no mean feat, showing the capability of medicine and science to
work in concert with government in the interest of the health of all peoples. Today there are large uncontrolled areas as far as prevention is concerned.

These are the result of poverty, social deprivation, ignorance, and malnutrition arising from a combination of ignorance and inadequate income and are responsible for a host of physical and societal ills. The cure of these ills is a problem for the totality of society and requires economic, political, and social action; this is not attainable through the medical profession alone, although the medical profession should whole-heartedly support the necessary societal action to bring them under control and also to bring the curative powers of modern medical sciences to the total society. Medicine should willingly support these efforts, but I seriously doubt that medicine, at least as constituted in the US today, is qualified by education, experience, or aptitude to handle these problems. I also question whether physicians trained in preventive and curative medicine and for research are really the best for this crucial function. I think we really need a different breed, educated and trained in the principles of politics, economics, and sociology first and well informed about what medicine can and cannot do for society. What is needed is social and institutional change in order to meet societal goals that will allow the full development and expression of human potential.

The dehumanizing conditions of the Industrial Revolution, child labour, the sweat-shop, and other forms of exploitation of man by man have steadily been reduced but more remains to be done. This, I submit, is the responsibility of all democratic institutions. If one tries to involve medicine with more and broader responsibilities, the curriculum becomes broader and the educational process longer. Curative medicine and basic and applied research, which society needs today as much as ever, become the losers.

I strongly believe that the primary mission of medical education is to produce a balance of physicians for primary medical care specialties, continuing medical education, and research. The educational period is already too long to expect individuals to devote time and service to learning political, sociological, and economic principles and practices in addition to the time spent on primary medical care. The economic and social aspects of health care delivery are based on social, political, and economic action. However, I do believe medical schools could profitably vivify Departments of Preventive Medicine where the emphasis today should be on occupational health and safety, industrial hazards, and the impact of man-made
pollutants on health and food chains. Here is an appropriate challenge to medicine, requiring intensive research and application. Accomplishments here could rival the earlier successes of this century in controlling infectious disease through sanitation, immunization and, more recently, antibiotics.

I subscribe wholeheartedly to Professor Rexed's concept of first providing the basic elements of curative medicine to the whole population before the widespread development of, for example, sophisticated transplantation centres and other costly outgrowths of our technology. If one can't have both, provide basic medicine first. In so doing, does one really need the highly trained physician to see each and every person who comes to the office or clinic? In this day of the computer and programming, simple screening methods have been developed to sort out, at the primary medical care level, those who need to see the more highly trained physician from those who need reassurance or simple therapy. Thus, I submit, the education and training of physician's assistants needs expansion.

Benjamin Franklin defined human beings as funnels, sponges, and sifters. Funnel: let information go in one ear and out the other; the sponge continues to soak it up, but does nothing about it; and the sifter sorts and selects the fruits of basic and applied research so that they may be used for the benefit of man. For an ever-expanding fund of basic knowledge in a wide spectrum, society requires an increasing number of gifted sifters, trained in many disciplines. In my opinion, medical education should be directed towards training physicians to back up primary medical care (need this be by physicians?) with the best of the specialties, to continue the educational process, and to enter basic and applied research. The existing medical curriculum, supplemented by technologies related to industry and the generation of energy, combined with the traditions of old preventive medicine, could educate a new class of individuals to perform basic and applied research in occupational safety, industrial medicine, and the hazards of all modern pollutants, showing government the areas requiring control through legislation. These appear to be manageable areas in existing technology; the other broader and more important problems of the health of society are related to the impoverished and underprivileged, the huge disaffected and neglected groups created by poor nutrition and lack of education. The problems they present are not problems for medicine per se, but are soluble by society through education and political, social, and economic measures requiring some sacrifice from the privileged for the benefit of the commonweal.
The overwhelming crying need is for an expansion of basic research - not only in molecular and cellular biology and pathology, but in the development of the technology necessary for understanding human behaviour and attitudes at the personal, group, national, and international levels.

Aging is a major problem for the developed world. In the USA, at least, this is now recognized appropriately by the formation of the National Institute of Aging, of which research is and will be a central mission.
THE ROLE OF RESEARCH AND DEVELOPMENT IN THE IMPROVEMENT OF HEALTH CONDITIONS

T.M. Fliedner, S. Heeg, & S. Biefang

Introduction

In yesterday's discussions, the question was raised as to the logic of the sequence of topics in our conference. We want to end up tomorrow by asking the question: in what direction should we help to reorient medical education in order to serve the needs and/or demands of society better? Yesterday, we accordingly examined the problem area patterns that are obvious when one tries to analyse health and disease patterns around the world and the impact of ill health and disease on society. Today, we want to examine the role of the medical profession in recognizing those needs of society that the medical profession can cope with and can do something about. From the discussion yesterday it appeared to us that it is necessary also to state clearly what the medical profession cannot do. We medical doctors should withstand the temptation to think that we can meet all the health needs of society, if health is defined as a complex of physical, mental, and social well-being. The physician should clearly define his role with respect to the health needs of society and should be courageous enough to state clearly what is not his role.

This self-limitation will then open up areas for other health professionals, and this is the starting-point for the concept of a health care team, which we will discuss tomorrow. Then the role of physicians will clearly stand out as unique.

Research to improve the quality of health

Let us assume that one wants to consider ways and means of improving the quality of health rather than the quantity of added years; then, there are probably three major areas where the necessary measures can be taken.

Firstly, one must improve existing potentialities and develop new ones for the prevention, early recognition, diagnosis, and treatment of disease and the rehabilitation of the patients. Secondly, one must improve existing
possibilities and develop new ones for the eradication of health-threatening environmental agents and the improvement of health behaviour. Thirdly, it appears essential also to improve existing possibilities and develop new ones in the system of health care delivery.

The first objective might be reached in two ways: through support of medical research and technology, and through the transfer of existing knowledge into practice.

The second objective can be served by research that addresses itself to the health-relevant problems of environmentally caused impairment of health and by research on how to improve health behaviour. But here, too, a wealth of information already exists and needs only to be transferred into practice. How can this be achieved?

The third objective can be reached through research aimed at making it possible to judge the quality of the health care delivery system and its elements. Further, the degree of knowledge of the tasks, the structural dynamics, and the efficiency of the system must be increased in order to plan, gear, and control it.

Let us now look at each major area in more detail: We can see that research will be of paramount importance as an instrument for generating new knowledge that may help in the attainment of the overall objective of improving the span of "productive life". It is obvious also that a great deal of knowledge is already at hand to put to use. Thus, research may be necessary in the field to explore just how one can change people's minds so that they actually do what they already know they should do. We recognize that there are areas in research that are not promoted by the medical profession but rather by people with entirely different backgrounds such as physicists and engineers, who take certain problems pertaining to the medical profession and then come up with specific solutions of their own (for example, the cell separation centrifuge).

The domain of medical research is, of course, the etiology, pathogenesis, and pathophysiology of disease. When we examine what we really know about the major diseases as we analysed them yesterday, we must confess our ignorance. How can we ever hope to prevent cardiovascular diseases if we really don't know all their causes.
Thus, a tremendous area of research possibilities and opportunities is opening up. What can we do with only limited resources, including man-power, better brain-power, and money? It is necessary to select. In so doing, we must remind ourselves of the overall goal - improvement of "productive life" rather than "prolongation of life at all costs". If this were borne in mind, research would be pushed into areas such as diseases of the respiratory system, of the musculo-skeletal system, etc. These problem areas would then be investigated in depth and strategies developed to find means of prevention, early recognition, control, cure, and rehabilitation. A detailed analysis of each specific case would bring forward the most promising areas of research. It would become clear that basic research, reaching down as far as the sub-cellular level of organization, is necessary on the etiology, pathogenesis and symptomatology of specific diseases.

But we must not make the mistake of limiting research to aspects of so-called "socially relevant" diseases. It is well known from history and proven day after day that other areas may be of very high scientific importance. Take, for instance, haematological diseases. We recognized yesterday how relatively unimportant they are, compared with other major killers in our society. However, there is no doubt in my mind that haematological research has served as a pacemaker for oncological research. Our knowledge of the kinetics, function, and regulation of cell systems and of their dysfunction - as in tumours - has been greatly influenced by the new knowledge generated in haematology. Let us now turn briefly to two other measures that are expected to contribute to the improvement of productive life.

One measure is the improvement of existing knowledge and the development of new knowledge in order to eradicate or at least neutralize those factors in our environment that threaten health and cause disease. In addition, consideration would be given to educational activities designed to improve the behaviour of human beings in a constantly changing environment. The medical profession participates through its activities in occupational and environmental medicine, and the methods are in part those of epidemiology. But just one step beyond is the field of biochemistry, of biophysics and also the disciplines of psychology and sociology (considering social factors that influence human health, such as stress, etc.)
Even if we improve our knowledge in the fields of prevention, early recognition, diagnosis, and treatment of disease and the rehabilitation of patients, even if we know more about the environmental factors that threaten our lives, and even if we know how to educate people specifically to accept existing or newly generated health knowledge, there is yet another area to be considered. And that is the health care delivery system. All existing and newly generated knowledge is used by people in certain social systems to help other people. The organization and administration of these systems may help or impair the basic desire to help others. Thus, it is necessary to investigate ways of improving a society's services. This is another area in which the medical profession cannot carry the burden of research and development alone. Physicians are indeed necessary, but it is essential that someone should examine the structure, efficiency, and dynamics of health care delivery systems so that they can meet the needs of a particular population at a particular time. Here, comparative research in health care delivery systems becomes important and revealing. In addition, research is necessary into the demands and needs of a particular society at a particular period in time for health care delivery. And, finally, it is important to conduct research on the resources needed to provide the services.

From these remarks it can be seen that members of the medical profession must participate in research, but cannot carry it alone; they have to work together with other professionals - sociologists, economists, administrators, politicians, etc.

Regarding our topic - what does it all mean for medical education? - I would like to say in conclusion that we must provide our students with the strong scientific knowledge required to approach a problem and solve it. We must trigger in them an enthusiastic awareness of the many things that have to be done to effect a genuine decrease in morbidity and mortality. And we must teach them the possibilities but also the limitations of the medical profession and medical training in coping with all the health problems of society. The student and all of us must learn to limit ourselves to those problems that we - as physicians - can perhaps solve, leaving the others to those who have learned how to handle them. That means that we must learn how to work interdisciplinarily, as members of a true health team, even in research.
The problem of health manpower development, including medical education, has in the past two decades been an increasingly frequent topic of discussion at various national and international meetings. During the current year alone, several international conferences are dealing with this important subject, such as this conference in Ulm, and those to be held in Berne, Chicago, Rio de Janeiro, and elsewhere. It has become a concern of health administrators at different levels, as well as of all those responsible for training institutions for health personnel and their teachers. As the declaration in the Constitution of the World Health Organization that "Governments have a responsibility for the health of their peoples which can be fulfilled only by the provision of adequate health and social measures" becomes more and more widely accepted, it is gradually being realized that health manpower is one of the most important components - if not the most important one - in the building up of health services. Therefore, though the title of my presentation deals with medical education only, I will, with your permission, enlarge on this topic and mention aspects of health manpower development as well, as is appropriate in connection with medical education which after all is an integral part of the overall health manpower development process.

Quantitative health manpower problems

The problem has clearly both quantitative and qualitative aspects. Concerning the first one, a statement from one of the reports on the world health situation can be mentioned: "All countries report that shortages of qualified personnel are a factor impeding the development of their health services". Numerous convincing, even shocking statistics showing such shortages have been published.

This may be illustrated by the following figures, which are drawn from a recent analysis of world trends in medical manpower.

The overall trend in the number of physicians (both absolute number and number per 10,000 population, referred
Fig. 1. Trends in the five-year rate of growth (\%) in medical density and number of physicians in the world*

Future Physician

to by the author as "medical density") at the world level is shown in Table 1. It is striking that the overall figures at the world level in 1970 - and the situation has not changed radically since then - were far from being high, and that the increase both in the number of physicians and in medical density tended to be slower than it was 20 years earlier (Fig.1). Just to show how low these world figures were, we give by way of comparison the medical density in the five Nordic countries (Table 2).

Table 1. World trends in the number of physicians and medical density, 1950-70

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of physicians</th>
<th>Number per 10,000 population (or medical density)</th>
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</thead>
<tbody>
<tr>
<td>1950</td>
<td>1,095,500</td>
<td>5.7</td>
</tr>
<tr>
<td>1955</td>
<td>1,312,800</td>
<td>6.6</td>
</tr>
<tr>
<td>1960</td>
<td>1,583,500</td>
<td>6.9</td>
</tr>
<tr>
<td>1965</td>
<td>1,910,400</td>
<td>7.4</td>
</tr>
<tr>
<td>1970</td>
<td>2,192,700</td>
<td>7.9</td>
</tr>
</tbody>
</table>

Rate of growth by 5-year periods

<table>
<thead>
<tr>
<th>Period</th>
<th>In number (%)</th>
<th>In medical density (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951-55</td>
<td>19.8</td>
<td>15.5</td>
</tr>
<tr>
<td>1956-60</td>
<td>20.6</td>
<td>3.6</td>
</tr>
<tr>
<td>1961-65</td>
<td>20.6</td>
<td>7.9</td>
</tr>
<tr>
<td>1966-70</td>
<td>14.8</td>
<td>6.7</td>
</tr>
</tbody>
</table>


Note: For the period covered by this table, the term "world" embraced all countries except the People's Republic of China (not including the Province of Taiwan), the Democratic Republic of Korea, the Democratic Republic of Viet-Nam, Bhutan, and Sikkim.
Table 2. Health manpower figures for Denmark, Finland, Iceland, Norway and Sweden, 1972a,b,c

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>Finland</th>
<th>Iceland</th>
<th>Norway</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in millions</td>
<td>5.0</td>
<td>4.6</td>
<td>0.2</td>
<td>3.9</td>
<td>8.1</td>
</tr>
<tr>
<td>Number of Dentists/10 000 population</td>
<td>7.6</td>
<td>6.3</td>
<td>5.0</td>
<td>9.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Capital</td>
<td>19.0</td>
<td>12.3</td>
<td>...</td>
<td>10.0</td>
<td>10.8</td>
</tr>
<tr>
<td>(7.0)</td>
<td>(4.9)</td>
<td></td>
<td></td>
<td>(7.1)</td>
<td>(8.3)</td>
</tr>
<tr>
<td>Urban total</td>
<td>9.9</td>
<td>7.8</td>
<td>...</td>
<td>9.9</td>
<td>8.8</td>
</tr>
<tr>
<td>Rural total</td>
<td>2.7</td>
<td>2.5</td>
<td>...</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Physicians/10 000 population</td>
<td>16.3</td>
<td>11.8</td>
<td>14.3</td>
<td>15.2</td>
<td>14.7</td>
</tr>
<tr>
<td>Capital</td>
<td>40.1</td>
<td>25.9</td>
<td>...</td>
<td>23.8</td>
<td>20.8</td>
</tr>
<tr>
<td>(6.8)</td>
<td>(7.9)</td>
<td></td>
<td></td>
<td>(7.9)</td>
<td>(8.0)</td>
</tr>
<tr>
<td>Urban total</td>
<td>22.6</td>
<td>16.1</td>
<td>...</td>
<td>17.9</td>
<td>15.6</td>
</tr>
<tr>
<td>Rural area</td>
<td>5.9</td>
<td>3.3</td>
<td>...</td>
<td>3.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Nurses/10 000 population</td>
<td>80.4</td>
<td>74.6</td>
<td>39.6</td>
<td>58.5</td>
<td>63.6</td>
</tr>
<tr>
<td>Capital</td>
<td>223.3</td>
<td>92.1</td>
<td>...</td>
<td>69.7</td>
<td>44.0</td>
</tr>
<tr>
<td>(5.5)</td>
<td>(3.0)</td>
<td></td>
<td></td>
<td>(5.7)</td>
<td>(3.1)</td>
</tr>
<tr>
<td>Urban total</td>
<td>151.5</td>
<td>76.1</td>
<td>...</td>
<td>49.7</td>
<td>43.5</td>
</tr>
<tr>
<td>Rural area</td>
<td>40.6</td>
<td>30.7</td>
<td>...</td>
<td>12.3</td>
<td>14.1</td>
</tr>
</tbody>
</table>


b Data on geographical distribution relate to 1970 except those for Denmark which relate to 1965.

c Figures in parentheses show the ratio between capital and rural areas.
The world figures mask, however, some very substantial differences in the various geographical areas of the five continents. In 1970 the difference in medical density between the geographical areas where it was the highest (USSR) and lowest (Africa) was in the ratio of 19:1. The annual rate of growth in medical density varies in the proportion 1:3 (the Americas and USSR, Table 3).

Table 3. Medical density in 1970 and its annual rate of increase by geographical region

<table>
<thead>
<tr>
<th>Regions</th>
<th>Medical density in 1970 (per 10,000 population)</th>
<th>Annual rate of increase in medical density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td>The Americas</td>
<td>10.8</td>
<td>1.0</td>
</tr>
<tr>
<td>Asia(^b)</td>
<td>2.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Europe(^c)</td>
<td>14.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Oceania</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td>USSR</td>
<td>23.8</td>
<td>3.0</td>
</tr>
</tbody>
</table>


\(^b\) For the period covered by this table, the term "Asia" embraced all the countries of the Asian continent except the People's Republic of China (not including the Province of Taiwan), the Democratic Republic of Korea, the Democratic Republic of Viet-Nam, Bhutan, Sikkim and the Asian part of the USSR.

\(^c\) For the period covered by this table, the term "Europe" embraced all the countries of the European continent except the European part of the USSR.

The range is still wider when we come down to country level. For example, in 1972 there were 44 countries in which the number of physicians per 10,000 population was below 1.0, including 23 countries where it was below 0.5. During the period 1950-70 a decline in medical density occurred in at least seven countries of Africa. In this continent, where there were 1.4 doctors per 10,000 population in 1970, the number of doctors will have to be multiplied by 2.4 if the same
density is to be maintained by the end of this century. However, if the medical density is to be increased from 1.4 to the still meagre 2.6, medical manpower will have to be multiplied by 4.6 - nearly quintupling in 30 years. Similar figures could be quoted for Asia.

These figures seem to confirm the hypothesis that, although efforts should - and obviously will - be made not only to maintain but also to increase substantially the present level of medical education facilities, costly though it would be, this alone could not solve in the current century the critical problem of providing total health coverage of the population in large areas of the world. Hence the need to seek feasible alternative solutions.

Speaking of the quantitative aspects of the health manpower problem, mention must also be made of the fact that qualified health manpower is not evenly distributed. Health workers tend to congregate in large cities even in countries where the great majority - up to 80% - of the population live in the villages. For example, the medical density in Senegal is 69 times higher in the capital than in the rural areas; in Malaysia the ratio is 61; in Mali and Niger, 45; in Thailand, 43; and in Togo and Uganda, 39. In most of the developing countries 70-80% of the population live in rural areas, while just as large a percentage of trained health manpower live in the big cities; this results in about 80% of health manpower serving about 20% of the population, while the other 80% of the inhabitants remain largely unserved. It is also well known that within large cities the distribution is likewise far from being even: the districts where the well-to-do live are over-served, while the slum areas are under-served or not served at all.

It would be incorrect to believe that this phenomenon is plaguing only the developing countries. Quite striking differences exist also in the health manpower density as regards physicians, dentists, and nurses, for instance in the five Nordic European countries (Table 2). The ratios in the three different manpower categories for the capital and the rural areas vary between 3.0 and 8.3, and the situation is no different in most of the other developed countries.

Another serious problem is raised by health manpower migration. The World Health Organization is carrying out a multinational study of the international migration of physicians and nurses in conformity with a resolution of the Twenty-Fifth World Health Assembly (WHA25.42). The first phase of the study
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is about to be completed and the results published. It shows clearly that there is a movement of skilled personnel, mainly from developing to developed countries. (A less marked movement is also occurring between developing and - to some extent - between developed countries.) Whereas the migration of other skilled workers has slowed down in recent years, that of health manpower is increasing, giving rise to considerable anxiety and concern.

The following examples are indicative of the dimensions of the problem in respect of physicians only. The WHO study has revealed that around 1971 some 140,000 physicians (about 6% of the total world stock) were working (or studying) abroad. In certain countries at least half the graduating classes emigrate immediately upon qualification, the extreme example being that of the Chiangmai Medical School in Thailand where the entire first class of medical graduates chartered a plane to emigrate. Each year the total volume of physician migration is equivalent to one-eighth of the output of the world's medical schools (excluding the USA and the socialist countries). The number of physicians who have emigrated from the Philippines was equivalent to two-thirds of the total stock of physicians of that country; in Iran, this proportion was one-third; in Syria, it was 40%; and in Haiti the number of those who have emigrated was greater than the total stock in the country.

Generally the direction of the flow is from developing to developed countries, but not all developing countries suffer from an outflow of manpower and only a few developed countries receive an inflow.

What has been the reaction of countries to the lack, maldistribution, and migration of trained health personnel? During the last two decades they have made enormous efforts to produce more health personnel, owing to the widespread belief that training more of the same workers (doctors, dentists, nurses, etc.) will automatically solve the problems of the health services (Table 4). As everyone knows, we are today, in spite of this, no nearer to solving health manpower problems than we were twenty years ago. It is obvious that besides the quantitative problems there are other, qualitative ones as well. Obviously, if we want to cure a "disease" and - even better - to prevent it, we need to know the "diagnosis" and "etiology", i.e., to identify the problems requiring to be solved; it is proposed, therefore, to proceed now with this exercise.
Table 4. Development in numbers of medical schools and physicians in the world and in Nordic countries, 1950-72

<table>
<thead>
<tr>
<th>Country or area</th>
<th>Medical Schools</th>
<th>MDs (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>567</td>
<td>1200</td>
</tr>
<tr>
<td>Denmark</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Finland</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Iceland</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Norway</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Total for Nordic countries</td>
<td>11</td>
<td>16</td>
</tr>
</tbody>
</table>


Qualitative health manpower problems

The major qualitative problems are well known, although their real socio-economic causes may not always be fully understood. They have hardly changed, and may even have been aggravated, over the past two decades; and present trends suggest that they will remain essentially the same for some time in the foreseeable future. The following list, which is far from being exhaustive, shows that the problems to be tackled are inter-related, not only with each other but also with various political, general socio-economic, and cultural problems.

It is quite obvious that there is an explicit gradation in the appearance of the problems, which occur in each country - if they appear at all - in a different way and context, and with a different emphasis and flavour.
The general socio-economic problems and the general problems of health services relating to health manpower are assumed to be known.

A few problems in the area of health manpower development may be mentioned:

In the field of health manpower systems:

(a) non-existence or inadequacy of national health manpower policies, leading to

(b) the absence of a well-conceived national health manpower system as an integral part of the existing health system;

(c) lack of integration, and sometimes even of coordination, of the different elements of the health manpower development process as shown in Fig. 2 (planning, "production", management) even where they all exist;

(d) as a consequence: (i) health manpower plans, if they exist at all, are not taken into account either quantitatively or qualitatively by the training institutions, which often do not belong to the same supervisory authority as the planning unit; (ii) there is no monitoring of health workers' activities; and (iii) there is no feedback to adjust the planning and training processes on the basis of that monitoring (Fig. 2);

(e) lack of coordination between the health manpower development process and other interested development sectors and agencies, primarily in general education but also in social security, labour, and agriculture.

In health manpower planning:

(a) lack of proper planning of health teams and, as a result

(b) undue emphasis on the traditional training of certain "classical" categories of health personnel, particularly physicians, at the expense of other categories.

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This means checking: (i) whether the health worker is being properly utilized at the tasks he was trained for; (ii) whether he is ready and able to cope with these tasks; (iii) in what fields his competence needs updating; (iv) his life and working conditions; (v) his job satisfaction; and (vi) his contribution to consumer satisfaction.
In health manpower "production"\(^a\)

(a) shortage of facilities for training the required type and number of health personnel needed by the national health services, on the one hand, and on the other, excessive student numbers in some health personnel schools;

(b) shortage of teachers in the health sciences who are also qualified to deal with educational planning and processes;

(c) lack of proper planning in: (i) training new categories of health personnel; (ii) reorienting the training of the "classical" categories; and (iii) retraining those already working;

(d) wide divergencies between academic and training goals on the one hand and service requirements, consumers' expectations and life style, and (most important) the general socio-economic situation on the other; and consequently

(e) unsuitability of curricula, methods, and evaluation for the training of health workers to meet community health needs and to work in teams, educational programmes being primarily directed towards medical and institutional curative care and consequently largely irrelevant to the tasks required outside institutional settings or in health promotion, in preventive work, and rehabilitation (the result being rather a disease professional than a health professional). In short,

(f) in the absence of collaboration between those responsible for the training of health personnel on the one hand and for health care delivery on the other, educational programmes tend to develop in isolation from the constantly changing health care needs; and

(g) a hostile attitude develops in some cases on the part of certain influential professional groups towards making radical changes in health personnel education with a view to rendering it more community- and/or team-approach-oriented.

\(^a\) Health manpower cannot of course be "produced", but conditions for the development of human resources for health services can, and should be created and developed as an important element of the process of Health Services/Health Manpower Development (HSMD).
In health manpower management:

(a) unattractive working, service, and living conditions for health workers particularly in rural areas;

(b) lack of security of tenure, lack of any career ladder, of vertical (and horizontal) mobility, and of moral and financial incentives, leading to

(c) lack of job satisfaction;

(d) absence of provision for continuing education, as an integral part of the health care and educational systems, to maintain and/or improve the level of competence and performance of trained health workers;

(e) inadequate training for top- and middle-level health administrators dealing with the planning, management, and evaluation of health programmes.

This long list of the most important problems permits us to establish the diagnosis of the main disease, namely that: the health manpower development process (Fig. 2) is fragmented and its components - being hardly connected with each other and even less with the health services development process - are thus largely irrelevant to the health needs and demands of the people. The brief name of the "disease" is: irrelevance.

In the specific field of medical education, the problems present themselves in a similar way.

In medical education:

A thoughtful observer of medical schools will be troubled by the regularity with which the whole medical educational system is isolated from the health service system of the country concerned. In many countries these schools and faculties are ivory towers where students are prepared for some ill-defined international "academic standards" and for the dimly perceived future requirements of the twenty-first century, while the pressing health needs of the society of today and tomorrow are often ignored.

Further problems are caused by: the exponentially growing amount of knowledge, and the continuous splitting of medical science into new and narrow subdisciplines; the increase in the number of departments arising from the latter; the lack
of integration - or even coordination - between those departments, between and within basic and clinical sciences; the lack of active participation by students (about which students bitterly complain and which they sometimes contest); inadequate curricula that are not relevant to the real needs of the society which the graduates will later serve; the lack of community orientation, the excessive disease and hospital orientation of teaching; an overloaded timetable not drawn up to suit the population's health needs and demands, but resulting from competition between teachers who weigh their prestige against the number of hours allotted to them; outdated teaching methods which impose on the student the memorization of fragments of information, but which do not help him to acquire the critical and independent thinking habits necessary for identifying and solving problems or to develop the motivation and habit of continuous self-learning; methods which do not take into account the fact that a student will learn how to solve a problem not by being told how to do it, but rather by experimenting to find a solution himself; outmoded methods of evaluation which only give some information on how the student's memory works and on its capacity, without assessing his ability to identify and solve the real problems that he will actually meet. This list, although not exhaustive, gives an idea of the problems that have to be faced in the field of medical education.

Once the diagnosis of the "disease" has been established, the question arises: what aims and objectives must be set up and what can be done to help solve the problems involved?

Aims and priorities

The health manpower development policy should be: to concentrate all national efforts in order to satisfy the health needs of the entire population through health services composed of balanced teams of health personnel, all health activities being undertaken at the most peripheral level of the health services that is practicable by the workers most suitably trained to carry out these activities.

The main aim in the coming years should therefore be to effect a radical change in health manpower development that will make it relevant to present and foreseeable community health needs.

The changes should result in a sound health manpower system that will plan, develop, and manage or utilize efficiently the right "mix" of health personnel to man well-conceived health and other services, will continuously
monitor whether they are functioning properly, and will adjust the planning and "production" systems on the basis of such monitoring (Fig. 1).

It is evident that each country will define its own objectives in a different way, taking into account its own priorities as defined in country health programming, national health planning, or some similar process. (The term "country health programming" is used by WHO to mean a systematic identification of priority health problems, for the specification of operational objectives for the solution of these problems, and for the translation of these objectives into programmes.)

Although priorities in health manpower development will of course differ from country to country, the two main priorities are:

(a) orientation of the development of all categories of health personnel towards the satisfaction of the people's health needs and demands, and not for the sake of professional interest. There should be no question, for example, of promoting certain categories of health personnel or the teaching of certain disciplines unless there is evidence of their relevance to present or foreseeable health needs;

(b) meeting the health needs of the most deprived communities, particularly rural communities, by utilizing personnel with the appropriate level of skills, in the first place primary health workers, as well as other workers to ensure for them effective support and guidance within the framework of comprehensive national health systems.

Primary health workers are simply trained community health workers recruited from the community which they are going to serve. Health manpower planning should, in certain cases, consider as an alternative the "tiered" health manpower system that is evolving in many countries. This links traditional with modern health care, through a system based on simply trained community health workers. The latter acquire the skills required to deal with common promotive, preventive, curative, and rehabilitative health problems and refer or report those requiring a higher level of care to health workers specially prepared for this function (medical assistant, community health nurse, etc.), by whom they are also trained, assisted, supported, guided, and supervised at their places of work. These latter are in turn assisted and supervised by professional health workers (physicians, nurses, etc.) in the next tier of the health system (health centre, district hospital, etc.). In planning for such a tiered system, the community - and within it the practitioners of traditional medicine and birth attendants - may provide an important source of community health workers.
This means that, besides the emphasis placed on the training of "classical" categories of health workers (doctors, nurses, etc.), a new and heavy emphasis should be laid on the training and utilization of auxiliary and community health workers and their supervisors. This new emphasis stems from the realization that the provision of training - generally hospital- and disease-oriented - for more physicians and nurses will not solve the health problems of many - for the most part developing - countries, in the near future. Hence, the need for non-traditional solutions. The number of physicians, nurses, and other "classical" categories of health workers will, however, also have to be increased. As their role will become more important, their education will need to be properly geared to the progress of science and to the needs of society. It must be made relevant to community health needs and demands without reducing its basic quality; it must, in addition, prepare health professionals for their leadership role both in the health team and in community development.

Proposed activities

Although it is important to define principles, objectives, and priorities, this will not solve the problems; problems can only be solved by activities for which these principles, objectives, and priorities set the stage, indicating the main directions.

It is clear that no one set of activities can bring about the solution of any set of problems described here, and if the objectives mentioned are to be achieved, there is a need for a logical chain of action. Such action will be required in each of the three main components of the health manpower development process, namely:

(a) health manpower planning,

(b) manpower resources development (health manpower "production", education and training), and

(c) health manpower management (administration).

These components should be integrated into a single process (Fig. 2) geared to the development of health services. The realization of this concept of integrated development of health services and health manpower (HSMD) is a precondition of success for activities undertaken in any of the above-mentioned areas.
Fig. 2. National activities in Health Services and Manpower Development (HSMD) and some of their inter-relationships

National bodies involved:
- Ministry of Health (or equivalent)
- Ministry of Social Welfare (or equivalent)
- Ministry of Education (or equivalent)
- Ministry of Socioeconomic Development (or equivalent)
- Ministry of Planning (or equivalent)
- Ministry of Labour (or equivalent)
- National Research Institutes etc., etc.
Medical doctors, as well as other health workers, tend to adapt to the existing health system even when they have been trained for different tasks. It is, therefore, the health systems which first require to be changed, and then the training of personnel for those systems. The kind of health system required is one that is accessible to all members of the community, that is concerned with promoting the health of the whole community, and whereby major decisions concerning health are taken and implemented by the community; finally it is a system in which the medical doctor is but one component, however important this component may be, as a member of a team in which each member does what he or she has been trained for and which is oriented towards identifying and solving the most urgent health problems of the community.

The aim of such new health systems will be health for all and satisfaction and understanding for both community and health workers, the latter being anyway part and parcel of the community.

Of course, we have to talk here not about health services, but about medical education and generally about health manpower development. It is necessary, however, to point out very emphatically that the development of health manpower is only one component in the development of health services, being simply an instrument for effecting health care. Thus, it is necessary to define clearly the types of health systems the health personnel will have to be trained for. Health services and health manpower should accordingly be developed in an integrated way. A country-specific permanent mechanism is required to achieve the functional integration of health services and manpower development; this will bring together all those governmental and non-governmental departments, institutions, and other bodies - each of which is responsible for certain aspects in this field - for the purposes of planning, management, and decision-making in this integrated development.

The establishment and functioning of such a mechanism should aim at a system whereby (1) planning of manpower defines the quality and quantity of doctors, nurses, and other health workers to be trained, and (2), all those trained for their specific duties are optimally utilized and are monitored when they are working; in this way the planning and training of manpower can be adjusted on the basis of data which are obtained by monitoring and later fed back into the system. Once the three main components of the health manpower development process - planning, training, and management of health manpower - have been integrated into a composite whole, this composite whole should itself be integrated into the development of health services. The application of such a mechanism
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should result in health services that are staffed by a sufficient number of health personnel possessing the skills required to cope with specific health problems and that will thus cover the entire population of a country, meeting their promotive, preventive, curative, and rehabilitative health needs and demands.

This mechanism will be responsible, first of all, for describing all the health problems of the country concerned, as well as alternative methods of dealing in an objective way with the priority problems, and then for making and implementing the necessary decisions on the basis of this evidence and following up the action taken. In this manner, important decisions are made by society rather than by the interested professionals.

The activities of medical schools, according to this concept of integrated development of health services and health manpower, are defined by health manpower plans which are themselves based on the overall national political framework, health policies, and plans. As for the health policies and plans, they should be integral elements of the general socio-economic, educational, and manpower policies and plans of a country and be based on appreciation of local resources and needs.

The health manpower plans should serve as a basis for the process of planning, implementing, and evaluating the education and training of physicians and other health workers for the health services. Such plans define not only the numbers and categories of health personnel to be trained, but indicate the knowledge, skills, attitudes, and areas and levels of competence needed to carry out the tasks to be performed by each of them. The definition of job patterns, on the basis of functional analysis, for the different types of worker within the health team leads to the specification of requirements and the translation of such requirements into learning objectives, and subsequently - on the basis of those objectives - into educational programmes, curricula, and methods, including formative and summative evaluation to assist the learners in achieving those objectives. Now is the time to replace the outmoded examination system used in medical schools, as well as in other schools for health personnel, by an evaluation system to measure, in a valid way, the problem-identifying, problem-solving, and decision-making capacity of learners, as well as their competence and attitudes; this system should also ensure both immediate feed-back and long-term assessment, by measuring the performance of former trainees in relation to the health care required by the community.
All this means that the educational activities of medical schools and other schools in the health sciences must become relevant to present and future community health needs and be oriented towards the satisfaction of the health needs and demands of the people, not towards professional interest.

In this concept, the training of health personnel should enable the graduates to identify and solve health problems, take decisions, make judgements, and continue learning throughout their lives. Only in this way will they be capable of coping with relevant problems not only upon their graduation, but also some 30-40 years later, that is to say, in the twenty-first century.

There are, of course, no blueprints for programmes to achieve the type of medical education outlined here, and anybody seeking them is pursuing an illusion. The essential task teachers and educational planners ought to undertake is to define the specific competences their students should acquire to meet the real health needs and demands of the community they are going to serve.

Moreover, teachers will have to learn how to apply a systems approach to educational processes, i.e., to the planning, implementation, and evaluation of teaching-learning; they will also have to learn how to facilitate learning. It should be noted that in this concept the centre of interest is the learner and learning - not the teacher and teaching.

This type of education requires that the community as a whole be used for teaching/learning purposes and that the hospital be considered only as a place where a certain stage of the natural evolution of disease processes can be studied. It should be clearly understood that through hospital-based teaching alone - even if occasional visits are paid to the community - no health- and community-oriented doctors with a real social responsibility will be trained. Similarly, if we want medical students to be able, upon graduation, to work in health teams and in certain cases even to head these teams, their training will necessarily have to be multiprofessional so that they may acquire the skills and attitudes required in order to collaborate with other team members.
Responsibilities of medical education (summary)

After this overview of problems, principles, aims, priorities and a few of the activities to be carried out, we can now state what the responsibilities of medical education are in preparing future physicians. Medical schools, as integral parts of the society in which they function, should make an effort to bring us closer to WHO's constitutional objective: the attainment by all peoples of the highest possible level of health (which includes physical, mental, and social well-being). They should change the thinking of teachers and of physicians already working, as well as contributing to greater social commitment on the part of the health care systems, keeping in mind the ultimate goal of medical education which is to prepare doctors to play their role in the health services of their country in such a way as to contribute to the improvement of health and - through it - to the improvement of the quality of life of the people: briefly stated, to become relevant to the health needs and demands of the community.

If this orientation is accepted, another question often raised can easily be answered, namely: should we train students for today or for the twenty-first century? We will aim at helping our students to become socially-conscious health professionals who will be able and ready to care for people and cope with priority health problems, not only upon graduation, but also in the coming decades, including the first decades of the twenty-first century.

The responsibilities of medical education may briefly be stated as follows:

- to participate in the integrated development of health services and health manpower, i.e., inter alia,

- to concentrate efforts on promoting changes in health systems, and

- to strive for medical education that will be relevant to the real health needs and demands of the population, relevant being the keyword.
Tempora mutantur, et nos mutamur in illis. Health manpower is not, and should not be, an exception to this maxim. We all have to be prepared to face the challenges of time and to live up to the expectations of the society to which we belong and which we serve.

References


THE ROLE OF PRE-MEDICAL EDUCATION

A. Gellhorn

Dr Fülöp has emphasized the importance of relating medical education to the health service system. He calls attention to the consequences of the isolation of health personnel education and training from the pressing health care needs of a community in such a way that undue emphasis may be given to the esoteric whereas the treatment and/or prevention of common but not trivial health problems receives limited attention.

Just as there must be purpose in the education of the medical student, interns and residents, and the practising physician, so must there be objectives in pre-medical education that are consonant with those defined by the medical school and those of the post-M.D. training phases. There is no reason why the education of the physician should not be a continuum rather than a disconnected series of educational experiences.

In the USA, medicine is the most popular career choice for young men and women entering college. Many factors contribute to this popularity, including the desire of young people to serve human needs, prestige, job security, and assured high income. Because the demand for medical education exceeds the available places in medical school, the competition is fierce, the attrition of prospective applicants is high, and the disappointments and dashed hopes are traumatic to many dedicated young persons.

There are 114 medical schools in the USA offering just under 15,000 first-year places. Applicants can apply to any of these schools although many schools are obliged to accept principally residents of their own state. Nevertheless, on the average, each qualified senior college student applies to nine schools. What are the pre-medical subjects which the medical schools require? Over 90% of them list biology and chemistry, including organic chemistry, as prerequisites; 50% require physics, 20% calculus, and 75% English. The implications of these figures are that most college students who hope to go to medical school place the emphasis on mathematics and the physical sciences, together with biology, because they must keep their options open to meet the requirements of as many schools as possible. Further, they know that 70% of the applicants who major in these sciences
constitute 80% of those accepted for admission by medical schools, whereas the small proportion who do major in English, history, sociology, political science, economics, philosophy, foreign languages, humanities, or general studies make up but 7% of those admitted.

The emphasis on the sciences in pre-medical education is a phenomenon that has occurred in the USA since the post-World War II explosion of biomedical knowledge consequent on tremendous financial support and growth of research. As is well known to the members of this Conference, the advances in medicine that have eliminated or controlled many of the major killing diseases of the early twentieth century have also presented society and the medical profession with unforeseen problems. In the field of medical education, there is the assumption that being able to cope with the new scientific knowledge and contribute to its growth, as well as growing with it, requires medical students with superior intellectual capacity and a sophisticated as well as extensive knowledge of the basic sciences. Thus, it is readily understandable that emphasis on mathematics and the physical sciences should exist in pre-medical education, together with a demand for high achievement.

Medical school applicants correctly or incorrectly believe that medical schools hold social sciences such as sociology, political science, or economics, or the humanities in low esteem and, as indicated, less than 7% of them major in these subjects.

In the USA, the current pattern of selecting college graduates with high academic records in the sciences and following up with a medical school curriculum that emphasizes the scientific aspects of the diagnosis and treatment of disease correlates well with the predominant choice of specialty and subspecialty training by the newly created MDs. Until World War II, 80% of medical school graduates trained and practised as generalists; in 1975, 87% of the graduates since 1950 had become specialists. Only now, and still very ineffectively, are medical schools beginning to consider the societal needs for primary care physicians who will be concerned not only with disease but with health as well.

What, if anything, does pre-medical education have to do with the final M.D. product? In my view it has three critically important educational functions. For all students who believe they wish to become physicians, pre-medical education should provide:
(1) the relevant knowledge and skills in mathematics, physics, and chemistry which are directly contributory to the understanding of the basic medical sciences;

(2) a comprehensive presentation of health in the nation and of the health care delivery system, with sufficient field work in an aspect of health care so that the student can test his or her true interest and commitment to medicine as a career;

(3) A broad and diverse educational experience in the humanities.

In the USA, as previously stated, the emphasis is on the physical sciences. Medical school admissions committees pay particular attention to performance in organic chemistry, not because of its importance in medicine but because it is a difficult subject as usually taught and, therefore, eliminates many aspiring young men and women with lower grades. The standard 1500-page textbook on organic chemistry widely used in the pre-medical curriculum is probably important to master for the individual who is to become a professional chemist. It is far too detailed and largely irrelevant for the potential medical student. Certainly you will agree that it is not necessary to know how to synthesize nylon (which is a common exercise in organic chemistry) to understand biochemistry. It is obviously important to know the organic compounds which constitute the human body, and if one can master an understanding of the reactivity of their functional groups then their synthesis and degradation in biological systems will be more readily predicted. To achieve this level of knowledge, a course of less than two years' duration can be devised which includes the requisite knowledge in general and physical chemistry as well as the organic chemistry base for biochemistry. A generous citation of applications of chemistry to medicine quickens the interest of students and heightens their motivation to learn.

The only justification for a course in physics for pre-medical students is to relate physical principles to those subjects that are pertinent to medicine. The relationships of physical phenomena to physiology are many and fascinating. Why shouldn't the pre-medical student understand that the principles which he is learning in mechanics are directly applicable to musculo-skeletal function, or that the phenomena of hydrostatics are significantly duplicated in the vascular system? Why shouldn't the study of radioactivity be related to the radioisotopes and radiotherapy used in clinical medicine, and
wouldn't it be most beneficial to relate the physical principles of electronics to their application in the multiplicity of black boxes that the student will use when he enters medicine? If this were done, the student might be the master, instead of the slave, of the various electronic instruments, that have now become more the hallmark of medicine than the stethoscope.

Before leaving the science prerequisites, let us briefly consider calculus. I am certain that there are a very large number of outstanding physicians at this conference. I would challenge any of these physicians to describe when last he carried out an integration or solved a double exponential equation in his practice of medicine. In my view, the requirement of calculus is principally to discourage potential medical school applicants rather than because it is necessary for the solution of the usual problems in the pre-medical sciences, the basic medical sciences, or clinical medicine. In my view, the concepts underlying calculus are important because rates play such a central role in both normal and pathological states. These concepts, however, can be readily taught when they are pertinent to a subject in chemistry or physics such as thermodynamics.

A far more important skill for the pre-medical student is probability theory and its application in biostatistics. If the physician is to be able critically to examine conclusions drawn from biological data, whether in basic research or clinical medicine, if the physician is to be able to draw his own conclusions regarding therapeutic trials rather than having to rely on the word of the drug salesman, then ability to examine and analyse statistical data is essential.

We have not discussed pre-medical courses in biology. Once in medical school, the student is going to spend the rest of his life studying biology and therefore I question the value of devoting much time in the pre-medical curriculum to this area. If a course is to be taken, I believe that the study of mammalian and microbial cell biology would be most pertinent and might obviate the necessity to take such a course in medical school.

It has often been said that the reason for the stress on the sciences in the pre-medical course is to teach students scientific method and how to think scientifically. I doubt very much that four years of college, university, or gymnasium are required to present scientific method and, in fact, the pre-medical science courses are usually so loaded with memorizing
and regurgitation for examinations that the excitement and satisfaction of setting up a hypothesis and then rigorously testing its validity are rarely experienced by the usual pre-medical student.

With the reduction in time of required science courses and the elimination of the excessive preoccupation with non-contributory scientific experiences, there is ample opportunity to learn about health and health care systems and even have a taste of medical practice as well. There are many ways in which the social sciences relative to health and health care may be taught. A valuable approach is to develop an interdisciplinary curriculum which provides the students with the knowledge and skills to analyse communities, whether rural or urban, and the health of their residents. Through a variety of didactic, seminar, and field experiences in demography, the social sciences, and political analysis, the students can be introduced to the health problems of a particular population. Through the combination of university course work and field applications the central issues of the impact of the physical and social environment on good and ill health become a reality. At the same time as it focuses attention on real-world problems, it also provides the student with the opportunity to measure his preconceptions of medicine, often gained from dramatic television entertainment or romantic fiction, against aspects that are closer to reality.

Finally, a generous exposure to the humanities is a necessary and invaluable component of pre-medical education. Not only is it essential for a student's personal growth and development, but an appreciation of the diversity of human experience as illuminated through culture will prepare him to react empathetically with persons with backgrounds differing from his own.

In most countries, entrance to medical school is on a competitive basis. In the USA, the attrition among students from the beginning of their university education with medicine as their goal to final acceptance into medical school is, conservatively, about 90% - i.e., only one out of nine starters even make it into medical education. Since the pre-medical curriculum is so heavily weighted by chemistry, biology, and other sciences, not only do those who are admitted have a science-skewed education, but those who drop from the competition along the way wind up with a poor general education that makes them ill-fitted for any career including that of a good citizen. If the reforms I have proposed were generally
adopted, those who found that they were poorly suited to the rigours of a science curriculum, or those who discovered that the realities of health care were incompatible with their image of themselves in white coats surrounded by an adoring populace, such students could change their career goals early and identify other opportunities more suited to their talents and personalities. There will be those who wish to continue in a service role in the health field in a capacity other than that of a physician. The education in college which emphasizes the relationships between health, medicine, and society will be most appropriate for such students and make them better social workers, community health technicians, nurses, or physicians' assistants. There will also be students who turn away from health careers altogether but who are stimulated by the physical sciences. Their early divergence from a pre-medical curriculum is important to their future activities.

Now I wish to return to Dr Fülöp's concepts. He has compellingly presented an interrelated scheme in which the provision of health services is central and health manpower planning, health manpower production, and health manpower management are interconnected and all contributory to health services. Although Dr Fülöp has emphasized the role of the physician as a provider of service, I am confident that he also recognizes the necessity to produce the scientist-physician to generate new biomedical knowledge. It seems to me that, after the pre-medical courses mentioned earlier, students can gain greater knowledge and skills either in the physical sciences if they are drawn to a career in biomedical research or in the community health disciplines if they plan to fill the medical service needs of society.

The pre-medical curriculum which I have advocated has been put to the test. In the Center for Biomedical Education at the City College of New York, a programme has been in progress for four years which is designed to select, educate, and motivate young men and women as physicians who will provide comprehensive medical care, with emphasis on preventive medicine, and to teach the skills required to carry on research in community medicine and community health. The students begin the course after graduation from high school, i.e., at the age of 17 or 18, and in a minimum of six years they meet the requirements for the Bachelor of Science and M.D. degrees. We have tested the hypothesis that it is possible to teach chemistry from the elementary facts through a sophisticated course in biochemistry in two years. It has been found that physics can be much more than a means
of disciplining the mind, for it has contributed directly to the course in human physiology. The explication of the principles of calculus as a part of the instruction in chemistry or physics has provided the necessary understanding and vocabulary for biochemistry and physiology. The course in biostatistics has not only introduced students to scientific and clinical data in medical journals but the application of the statistical methodology in other subjects in subsequent years gave students the necessary practice to make the concepts and techniques stick.

The integrated social sciences sequence has also been tested and has been very successful in motivating as well as instructing students on the health needs of the under-served urban communities. Following the first-year sequence which has been described earlier, the students spend seven weeks working and learning as part of a health team. As Dr. Fullop has pointed out, the physician of today must understand how to function effectively in such an organizational arrangement.

In the second year in this sequence, the students are introduced to occupational health, nutrition, and epidemiology. The field work consists of identifying a particular health problem in an urban community and developing a research proposal aimed at its solution. Such learning-serving opportunities in the pre-medical years would be an invaluable addition to the education of the potential medical student, for experience has shown that once a student enters medical school he becomes so preoccupied with those courses considered important by the faculty, that community medicine and community health are given little attention.

The post-World War II emphasis on science coupled with a serious neglect of the social sciences and humanities needs re-examining. While the pre-medical and medical student's teachers pretend that the only evidence of capability to be trusted is one based on grades in the physical science courses or that the secrets of medicine are revealed only to those whose biochemical background is outstanding, the student ultimately learns from the study of his patients that the data he uses are not of the crude type with which the scientist has to deal but are more subtle, more human - each tinted with colours of personality and emotion. Let us then recognize that the pre-medical student must be exposed to all of those components which at last will equip him to care for the health of individuals and populations. The time for reform in pre-medical education is now.
Although the selection of students for medical studies is practised in all countries, there is considerable variation in the objectives and methods of the selection process. The methods employed reflect in general the social situation. Examples include the following:

1. Direct admission of all applicants into a medical faculty independent of their orientation - humanities or science or mathematics - followed by exclusion of a high proportion of the entering class at the end of the first year. Typically only 20-50% of the original class enters the third and subsequent years of study.

2. Orientation of young people during the final years of their secondary education towards the basic scientific disciplines, and direct admission of all those who have passed in these disciplines at a prescribed level into the medical school. Selection takes place at the end of the first or the second year, leaving only about half the class. Typically 20-50% of the entering class is eliminated.

3. Competitive selection of relatively large or even small classes from among available candidates, independent of their orientation, and a comparatively low attrition rate.

4. Competitive selection of applicants with stated minimum scientific qualifications; such selection includes a competitive examination as well as interviews. Only relatively small numbers are admitted (less than 50 per class), and the majority of those who enter (over 80%) go on to qualify as doctors.

5. Selection from among holders of university degrees (usually in scientific disciplines, sometimes in the "liberal" arts).

6. Competitive selection of nurses and other health personnel (e.g., medical assistants, etc.) to form part or, exceptionally, the majority of an entering class.
Who does the selection? Sometimes it is the Dean, but most often, a standing committee of the faculty board called the admissions committee. In a number of centres medical students and lay personnel serve on the admissions or selection committee. In several countries where rigorous manpower planning is practised, orientation (rather than selection) of applicants is done centrally, by either a University or an Education or Economic Development Ministry special committee or a "joint committee". After a careful study of the students' school performances and a consideration of local political, social, and other factors, students are assigned to medicine or to any of the other available university or post-secondary courses. In these circumstances the function of an admissions committee (if one exists) would be to study and review the past scholastic attributes of the students assigned to the medical school. Occasionally the special orientation committee reviews applications from candidates referred to it by sponsoring agencies, urban or rural communities, political party units or subunits within the country, etc.

What are the objectives of "selection"? Many admissions committees wish to identify individuals who not only are "bright" enough to survive the medical course but also will make good doctors. It is comparatively easy to identify those students who are intellectually capable of successfully undertaking medical studies, or indeed any post-secondary studies. In general they are individuals who possess a good capacity for reading and writing in a language that can he adapted to modern technology and, in addition, are capable of handling basic mathematical processes.

This type of individual would have had little or no difficulty with secondary school education whatever the discipline: languages, the physical, biological, or social sciences, sports and social activities. Although there are exceptions, any one who has had a major intellectual difficulty in completing his secondary education should be discouraged from entering medical school.

On the other hand it is difficult, if not impossible, to identify the student who will become a good doctor. What is a good doctor? A great deal of effort has been deployed in the search for criteria by which members of an admissions committee could predict the type of physician a particular candidate would be, and on the basis of such criteria recommend admission or rejection. What medical educators often forget is that it is their responsibility to mould their students into whatever type
Selection of Applicants

of physician their particular country, state, or continent requires at that particular stage. Medical education is essentially a conditioning process, and this process does not stop when a young man or woman passes his or her final examination; it continues into the early years of his or her professional life.

In circumstances where the medical school has the privilege of selecting its students, the faculty board should concentrate on excluding those candidates with a poor or mediocre scholastic history and those whose physical or mental health is in doubt; as well as those who have a past history (obtainable from school records) of abnormal or antisocial behaviour. When this has been done, the faculty board should intensify its efforts to establish carefully defined educational objectives, organize a teaching programme based on these objectives, and devise suitable methods of evaluation that will have a good chance of creating the type of doctor who will satisfy the needs and aspirations of contemporary society as well as maintaining the fundamental ethics of the profession of medicine.

Having excluded those who are clearly unsuitable, admissions committees are usually left with too large a number of acceptable candidates for the number of places available. The committee should carefully examine the question of student numbers, since this is what determines the type of training that can be given. The temptation to train a very large number of doctors in tiny medical faculties (with fewer than 30 teachers) should be strongly resisted. The intake should be reviewed realistically at least annually, in the light of available staff, physical facilities, and equipment.

There are several ways of making a selection, the choice being determined by purely local factors. But the committee should always grade its candidates in order of merit or at least classify them as objectively as possible in the following manner: exceptional ability, good candidate, average ability (grades A, B, and C). Grading would be based upon more than one of the following:

- secondary school record and headmaster's report
- special aptitude tests
- competitive examination(s)

When candidates are graded, only a minority will fall into grade A. These deserve places and should be recommended for
admission. (In some countries some of the exceptionally able candidates are assigned to other key disciplines such as agriculture, and the physical sciences, etc. Many will fall into grade B (about 30%); and the remainder (about 60-70%) will be in grade C. This "objective" grading should be carried out, if possible, before the candidates appear before the interview or selection panel.

Experience shows that whereas grade A candidates (all other things being equal) become good medical students and grade C candidates may or may not have difficulty if admitted, there is little point in allocating places to group B candidates in the strict order of the above arbitrary grading. The selection committee has an obligation to study each case on its own merits and should be free to make recommendations based upon local realities. The performance of group B candidates would vary according to the tests given. Not infrequently those who rank in the middle of the group come out near the top of the class during the clinical or later phase of the curriculum. It is here that committee members should look for early leadership qualities, wide intellectual and social interests, factors that would lead to high motivation, the importance of the role of women in medicine, geographical or ethnic origin, sportsmanship, professional family history, and any other factors that would serve the institutional objectives of the medical school. An institution wishing to train general duty medical doctors cannot succeed in its objective if it limits its selection to candidates with a very strong passion for scientific enquiry and possibly a dislike for human or social contacts. A few places may be offered to group C candidates who demonstrate certain socially desirable qualities or whose admission might strengthen and reinforce the medical school's objectives. They should however be carefully observed, and given supplementary tutoring if necessary.

This pragmatic approach is recommended especially to faculties in developing countries with limited resources. It would result in a class of students that would include a minority of very superior intellects, a majority of very able skilled professionals, and possibly at the other extreme of the normal distribution a small number of young or mature individuals with highly desirable social characteristics.
THE MEDICAL CURRICULUM

H.G. Pauli

The main points in Dr Fulop's introduction were the demand for relevance and the demand for feedback between education of the health professions and health care delivery, both demands, of course, being interrelated. Emphasis on these demands, unfortunately and unnecessarily, is often interpreted as a trend towards an unscientific or antiscientific philosophy of medicine, a move away from scientific education towards vocational training. I would therefore propose to add as a third point of departure the demand for a scientific concept and structure for a more community-oriented and less specialized medicine. It is certainly due to the attitudes and preoccupations prevailing among us, the academic part of the profession, that a scientific concept has become strongly associated with specialization and dissociated from generalization. However, there is no reason to assume that generalization is less scientific than specialization.

I feel that I must translate these demands into some practical consequences for educational systems.

One conclusion to be derived from the above-mentioned demands, namely the need to put the student in a practice setting, calls for new educational structures, as the traditional ones hardly offer such settings. There are three options. Existing (traditionally specialty-oriented) departments can be transformed to include the community and general (or non-specialized) components of medicine, a development usually resisted by the prevailing attitude of departmental autonomy. Secondly, new departments (of community medicine or general practice) can be created, a development recently observed in the Anglo-Saxon countries and in the Netherlands. Thirdly, students can be placed in peripheral settings of primary and community care.

If this exposure to a non-academic medical practice is to take place early in the curriculum and to be integrated into the total of its course, one will have to abandon the traditional "stratified" pattern of studies in favour of a comprehensive or (according to Dr Prywes) "spiral" one. The organizational principle of the latter is the learning situation of the student and not some
taxonomical or hierarchical sequence of subject, characteristic of the former.

The trend to shorten the duration of undergraduate education has to be seen in this context. If the main outcome of undergraduate medical education is going to be a set of skills (among others the skill to retrieve information) and attitudes instead of an ever-increasing stock of knowledge, then indeed the formal termination of undergraduate studies can be advanced in time. The ensuing period of professional practice, however, will then have lost some of its former (at least, potential) independence; systems of control (recycling, relicensure) and of continuous education will have to become an integral part of a physician's existence. The vision of an integrated practice and learning is better fitted to the reality of an unprecedented rate of generation and of decay of medical knowledge than the traditional long-lasting scholarly initiation into the profession, followed by a professional practice more or less devoid of educational and other supportive resources.

A sound mix of the biological and social/behavioural sciences has yet to be found. Shifts in this mix will be met by controversy in a profession brought up predominantly in the tradition of the exact and biological sciences. The above-mentioned need for a scientific concept and structure specifically concerns the as yet ill-defined social and behavioural science part of medicine. Only the establishment of a theoretical basis leading to the collection and application of empirical data in this domain will help to reduce the uncertainty in educational decision-making in this respect.

The concepts of evaluation must be reconsidered. The central question used to be "How well are we teaching?" It shifted to "How well are our students learning?" We are now beginning to ask "What is the health status of our patients, of our communities?" The educational sciences will not suffice to answer this question. The task becomes an interdisciplinary one. Health care research will be the main additional input to this new area of assessment of the outcome of professional work.

I realize that this list of the foreseeable consequences of an increased interaction between medical education and health services is an incomplete and personal one. I hope that the discussions in this conference will enlarge this list and reduce some of the related uncertainties.
DISCUSSION OF DR FÜLÖP'S PRESENTATION

A. Querido

I have indeed enjoyed Dr Fülöp's thorough presentation, and I fully endorse his major conclusions and recommendations, which may be summarized as follows:

1. The goal of health manpower planning and medical education should be to satisfy the health needs of the entire population through health services composed of balanced teams of health personnel.

2. In health manpower planning there should be close cooperation between the authorities responsible for education and those responsible for the health service system.

There are, however, some aspects of the structuring of medical education which I wish to explore further. I believe, very generally speaking, that all medical education, even in widely different countries, is based upon a plan that contains two components: general and basic education which involves moving from the secondary to the tertiary level and preparation for professional training; and professional education, which imparts the knowledge, skills, and attitudes necessary for the tasks ahead. These components must be present in each system of medical education.

If indeed medical education is a kind of reflection of plans for health services based on present and future health needs, it is necessary to determine what makes health services comparable and what makes them different. All health service systems are based on the response to needs and demands in a given socio-economic setting. Demands are closely related to the educational level of the population, communication systems such as television, etc. Demands or expectations vary also between different social strata. In each health service system, however, there are three common components that can be identified, namely: public health (sanitation, nutrition, health education, etc.), community medicine, and hospital care.

The tasks that each of these subsystems can fulfil in different countries vary widely and are largely determined by two conditions: the funds that can be spent per capita.
and the expectations of society. (Expenditures in a developing country may be $1 to $10 per capita, while a developed country might spend $25 to $500 per capita, or more.

Obviously, then, there are different requirements for different health service systems which affect medical education. This does not alter, however, my general statement that there is a close interaction between the health service system and the educational system.

The question whether science-oriented programmes are opposed to problem-oriented ones involves very basic issues, such as what knowledge in fact is, and what kind of knowledge can be made operational for action. In my opinion there is no controversy, because the science-oriented programme relates to curriculum content, and the problem-oriented one, which aims at improving problem-solving skills, relates to teaching methodology.

The importance of science subjects for the curriculum and their contribution to it are twofold. In order to achieve effective use of the many powerful drugs available and to prevent their misuse, for example, one must have a sound education in basic functions at the level of the cell, the organs, and the organisms. This relates to the factual information content of science subjects. If well taught, however, the science-oriented part of the programme also fulfils another important task. Problem-solving is in fact nothing else but testing hypotheses, consciously or unconsciously. The hypotheses are developed from facts of a somatic nature and derived from behavioural and social information. The process of formulating a hypothesis is very complicated and requires a sound knowledge for the recognition of facts. The more complicated the society, the more difficult the construction of the hypothesis. As the sciences have long experience in making their knowledge operational, one may expect that teaching science in the right way (not in the form of a plateful of facts) could contribute essentially to the general formulation of hypotheses and effectively promote the handling of facts.

I would be the first to agree, however, that most medical curricula are not structured in this way. I am therefore convinced that the time has come for a full review of curricula content.
THE NEW SYSTEM OF EXAMINING MEDICAL STUDENTS
IN THE FEDERAL REPUBLIC OF GERMANY

H.J. Kraemer

In 1970, new regulations for educating and qualifying medical students were passed in the Federal Republic of Germany. The regulations - "Approbationsordnung für Ärzte" - decisively changed the procedure for examining medical students. Before they came into effect in 1974, students were tested orally, the examinations being administered by many different professors in the field of medicine. Examinations were not consistent throughout the Federal Republic. Since 1974, medical students have been tested with written examinations administered by a central office. All students receive the same examinations under identical conditions. In addition, there have been changes in the subject matter of the examinations, so that subjects like medical psychology and medical sociology are now included. And there is also more emphasis on ecological subjects such as social medicine, preventive medicine, and public health.

The administration of medical examinations from a central office required a special legal arrangement. According to law in the Federal Republic, the regulations governing medical education are issued at the national level, but the application of the regulations is carried out by the states, the so-called "Länder". The regulations passed in 1970 made provision for a central authority which would control the examination system. The federal states signed a bill which created this central authority, the Institute for Medical Examination Questions, located in Mainz. The Institute's activities are subject to approval by the states.

The Institute has three functions. First, it must prepare medical examinations using multiple-choice questions and distribute the papers to testing centres in the various states. (After administering the examinations, the states return the papers to the Institute for evaluation and analysis.) The Institute's second function is to develop and publish the so-called "Gegenstandskataloge", the catalogues containing the medical knowledge deemed suitable for use as a basis for the written examinations. The third function is to engage in applied research concerning the methodology of examinations. These functions are fulfilled under the direction of two authorities: an advisory board composed of one official from
every state in the Federal Republic and a director, who supervises the Institute's operation. In addition, the Institute has the status of a legal entity; this allows some flexibility in the performance of its functions.

In 1975 the Institute became responsible for developing examinations for pharmaceutical students. It is now called the Institute for Medical and Pharmaceutical Examination Questions, and retains as consultants 120 medical and 30 pharmaceutical experts. All experts serve for two years. Among these experts four committees of medical experts and two of pharmaceutical experts have been formed. Within these committees are subcommittees which include representatives of related fields. This arrangement is designed to avoid concentration on a particular subject.

Setting up the Institute was a challenge because there was no model for us to follow. There had never been any comparable institution in the Federal Republic. And differences between German and Anglo-American law prevented us from following the example of the National Board of Medical Examiners. The early life of the Institute was rather hectic, as there was a period of only two years between its foundation and the scheduled administrative of the first written examinations. In this short time it was necessary to acquire a minimal scientific and administrative staff, solve various organizational and financial problems, and develop the first examinations. In the face of this heavy task, we wanted to avoid creating a merely bureaucratic institution that would be unable to recognize the realities of education and examinations. Close contact with the universities was accordingly required, so medical teachers were retained as advisers. In the first few months there were some problems because many of the teachers were critical of the new examination system. Within two years, however, and without any prior experience, we succeeded in publishing a series of four medical study catalogues and preparing the first written examinations, which were administered in eight nationwide sessions to a total of 25,000 students.

We knew quite well from the beginning that the amount and distribution of the medical knowledge published in the catalogues could hardly satisfy all parties concerned. Since definitions of the "basic physician" and of his or her proper education are rather imprecise, we lack a firm guideline for establishing a medical curriculum. The legislature, with good reason I believe, neither defines what a physician is nor declares what a physician's education should be. Consequently, university teachers and medical societies were apprehensive that topics omitted from the first
catalogue would never again be taught or examined; they therefore tried to include in the new catalogues as much data pertaining to their own disciplines as possible. As a result, the first catalogues were large. Their size was criticized not only by university teachers (who more or less accepted the coverage of their own disciplines) and students, but also by interested persons abroad.

We readily accepted these criticisms and soon completely revised the first of the four catalogues. We are hopeful that our revision was successful. The revised first catalogue will be published in October or November 1976. The revision of the second catalogue is now under way - with the aim of shortening and concentrating its contents. In contrast to the development of the earlier catalogues, we are now - fortunately - not under so much pressure to meet a deadline. Now we have time to ask for comments on the catalogue drafts not only from our own experts, but also from university professors all over Germany. We sincerely hope that this procedure will yield a catalogue that can serve as a basis of mutual confidence. As a footnote, it should be mentioned that several countries, including some from Asia and from the socialist sphere, are using our catalogues as a basis for their own developments in this field.

As mentioned earlier, experts are producing the multiple-choice questions in collaboration with our own scientific staff. There is some difficulty in constructing questions because medicine is not always an exact science. The questions must be focused not only on the crucial points of medical knowledge, but also upon the complex connections among these points. To avoid faulty questions and answers we have developed a rather sophisticated filtering system through which all potential questions and answers must pass before they appear in an examination. Once the papers are printed and used by the students, there is the possibility of further criticism. Every medical student in the Federal Republic has the right to check the correctness of questions and answers. If a student is suspicious of any question or answer, he may ask for legal clarification in court. We are pleased to say, however, that our filtering system has kept this process to a minimum. Out of 25,000 students tested so far, only six or seven have requested legal proceedings.

We are also proud of our computerized evaluation system. Only two weeks after an examination has taken place, every
student has received his test score. We analyse the examination results; from this analysis we gain valuable information which might help improve the examination system. Comprehensive reports are given to the universities and other interested institutions three or four months after the examinations. This feedback to the universities might help determine the future course of medical education.

We are fully aware that written tests in medicine, like those in other sciences, are appropriate only for evaluating the knowledge of facts. Medical abilities and the ethical aspects of medicine cannot be the subject of multiple-choice questions. (It is doubtful whether these subjects should be tested anyway; the teaching of these sections of medical education should be the responsibility of university teachers exclusively.) From analyses of test results we can recognize bottlenecks in certain areas and see what aspects of the examination system could be improved. This requires checking each subject's coverage and its relation to other topics.

This new examination system should help to establish a common - and, we hope, high - standard in medical and pharmaceutical education. We hope it stimulates the creation of a body of basic knowledge compatible with the fields of medicine and pharmacy. We hope, too, that it will lead to new educational liberty to the benefit of all partners in education.

Knowledge, ability, and concern for mankind are all attributes of a good physician. But before the ability and concern can be applied in actual practice, the physician's knowledge must be inculcated and examined.
MEDICAL EDUCATION AS A SOCIAL PHENOMENON

M. Prywes & A. Antonovsky

Let me, as a point of departure, suggest that one can interpret the title of this talk in three possible ways. One can adopt the fatalistic position which argues that, no matter what goes on in medical education, most students will somehow learn enough to function as physicians, but that the nature of their functioning will be determined in all but the most minor of ways by the social structure and culture of the health care institution. One can push this position even further, and view medical education as a very direct reflection of the society in which it takes place.

As scientists, we cannot ignore the very good evidence in support of this interpretation. It may be comforting to think that Flexner was an innovator, whose genius generated changes in medical education and subsequently in the health care system. It would, however, be more accurate to see the Flexner Report as coming in the wake of changes in the health care system and seeking to bring medical education into line with these changes.

The second possible interpretation of the title is one that seems to underlie most discussions of medical education. The world of medical education is seen as a world apart, autonomous, and with a very large number of degrees of freedom. What we do with our students and the way our graduates will work is, in this view, shaped by our wisdom and our follies, our virtues and our vices, our knowledge and our ignorance. With clear goals - and much thought and effort are indeed invested in clarifying these - we can go about charting our course of medical education. Those who are not smug stress the importance of research and experimentation in medical education. Those who are smug, who know that our products are as good as can be, i.e., who are like us, feel no need for wasting resources on such matters. The former come to conferences on medical education, the latter avoid them. But what both share in common is viewing the medical school as an ivory tower, unsullied by the world outside. The smug teachers may be scientists, but science is not applied to teaching; the non-smug ones are scientists in a methodological sense, but the questions they ask may be the wrong ones.
The first interpretation, then, suggests that medical education is a social phenomenon in that it reflects the society in which it takes place. The second interpretation suggests that medical education is a social phenomenon in that it constitutes a society unto itself. That which is of utmost interest to us - the functioning of the product of medical education - is shaped, in the former view, by the larger society and, in the latter, by the micro-society of the medical school. In a work that has had considerable impact in recent years in the social sciences, Kuhn has pointed to the importance of paradigmatic orientations in shaping the questions scientists ask. These interpretations are, I suggest, representative of such orientations.

But there is a third possible paradigm which can be adopted in interpreting the title of this talk. It may be that I have arrived at it because I have lived for a considerable number of years in the broader society as well as in the confined society of medical education. Or it may be that the venture in which I am now engaged in Beersheba has led me to it. Whatever the case, I put it to you that neither of the first two paradigms is adequate in understanding what goes on in medical education and what our graduates do.

I find it useful to conceptualize this third paradigm in terms of the traditional epidemiological triangle of host, agent, and environment. Much as we have come to understand many processes of pathology only by studying the interaction of the three, so we can, I believe, best understand the processes of medical education and the work of the graduate as a resultant of three types of input: that of the host, i.e., the student (and later, the practising physician); the agent, i.e., the teaching institution; and the environment, i.e., the historically, structurally, and culturally defined broader environment.

What I now propose to do is raise, with respect to each of these three elements of the triangle, a number of questions which I regard as crucial. Though this list is not, of course, definitive, and each of you could add to it, taken together, the questions give at least a rough picture of the sense in which I regard medical education as a social phenomenon. I will briefly suggest alternative answers, some of which are theoretical, while others are quite adequate descriptions of the reality of much of medical education. The answers which are accurate for any given medical school group together and, in sum, shape the outcome which is our concern.
There are, I suggest, at least four crucial social-phenomenological questions to be asked about the host element:

1. What is the social composition of the student body? Medical students never have constituted a representative sample of young adults; they should not and indeed cannot do so. But a wide range is possible. At one extreme, we find a student body which is largely élitist: males, of upper-middle and upper class origin, metropolitan, members of majority ethnic groups - in sum, the "old boy" type. At the other extreme, we can conceive of a student body with a very substantial representation of both majorities - women and the working and lower-middle class - as well as of minority racial, ethnic, and residential groups. All of these groups tend to be second-class citizens in the delivery of health services.

I am well aware of the thoughtful, psychologically secure, idealistic student of élitist origin, who casts in his lot with the underprivileged, as well as of the underprivileged student whose only concern is "making it" and getting into the Establishment. But at least statistically, and for good sociological reasons, the more our student body consists of our own children, so to speak, the less likely is the status quo to be challenged.

2. What are the dominant value orientations of the student body? My colleague Judith Shuval has, in her longitudinal study of Israeli medical students, suggested that there are three major value strands in the way youngsters view the medical profession when they come to and as they move through medical school. She has called these "people, science, and status" orientations. They are not, of course, mutually exclusive; it is, rather, a matter of emphasis, of preference when they come - as they do - into conflict with one another.

3. How do the students relate to the medical school? At one extreme, it can be seen by them as an institution that has the power of life and death, so to speak, over one, or, less dramatically, as an institution which society invests with the power to facilitate or frustrate the realization of one's goal, i.e., becoming a doctor. In this case, one had better very quickly learn the rules of the game as established by the powers that be, and conform to these rules, at least overtly. If not actual enemies, students and faculty become adversaries, the students doing their best to outwit the faculty,
the faculty doing its best to "keep up standards". In the last analysis, the best way of beating the game is to join the other side.

A more likely pattern, however, particularly in the later years of school, is that in which conformity to a superordinate-subordinate relationship is accepted not only for lack of alternatives, but because the student comes to see it as appropriate to the medical world. As he comes closer to being a doctor, he no longer sees himself as a low man on the totem pole, but transfers the model of the hierarchical relationship to his interactions with nurses, other staff, and particularly patients.

I find it difficult to conceive of the possibility, not to speak of the wisdom, at the other extreme, of a medical school as a democratic institution. The student's inevitable inexperience, lack of knowledge, and transience prevent such an expectation. One can, however, conceive of students defining their role as that of junior partners. They are no longer children; they are capable of evaluating a teacher or course, of having ideas for improvement, of wishing to be listened to. At the core of this alternative is an identification with the institution, a feeling of it being theirs, and a sense of feeling responsible for their own education.

4. The final question to be raised about the student is that of the social structure of the medical school class. Again, one can identify different patterns. At one extreme, we find that of individualistic competition, with each student perceiving the other's survival only at his own expense. Even short of this extreme, one's own interest, in both senses of the word, can be defined as differentiated from the interests of others. In this case, joint ventures, helping and being helped, can only come at the expense of sacrificing the scarce resources of time and energy. At the other extreme, the class comes to constitute a self-defined, conscious collectivity, in which cooperation and adherence to group norms takes precedence over individual achievement.

The teaching institution

Here, too, I would point to four aspects of the social characteristics of the medical school and its faculty that provide major inputs into shaping the course of medical education.

1. How have the faculty members been trained in their role as teachers? This, as we all should know but often disregard,
is a very different question from asking how they have been
trained as scientists and physicians. It seems to me that
there are three social patterns which answer this question.
There is, first, the teacher who has simply never been trained
as a teacher. He functions in accord with the tradition that
there are social roles, such as parent and university teacher,
which come naturally. One does well or badly, as the case may
be, and there is nothing much to be done about it. Second, there
are those who have been trained, or have trained themselves, to
teach, i.e., to demonstrate their own knowledge and skills.
They lecture, demonstrate, behave - and it is to be hoped that
the spark will ignite, the lesson be learned. The third
pattern is quite different: that of the teacher who has been
trained to facilitate learning. He is not concerned with how
brilliantly he teaches, but rather with what the student learns.
He sees himself as no more than a tool - true, by far the most
important tool - which the student is invited to use in order
to learn.

2. The second crucial question relates to the structure
of the teaching institution: to what extent are there, in this
structure, built-in, institutionalized mechanisms for criticism,
evaluation, and the introduction of change? One answer that we
find in medical schools is simple: criticism, evaluation, and
changes are largely external to the system, haphazard, in
response to pressures and blatant failures, or by-products of
such things as struggles for power. A second pattern is that
of "tokenism". A medical school will set up a department of
medical education, a curriculum evaluation committee, a research
programme, student representation, etc. - but will make sure
that these structures are accompanied by little power. Then
again, a third pattern is possible, that in which substantial
power is invested in roles and groups in the medical school
structure whose official job is to play the devil's advocate,
to ask for evidence, to challenge complacency and assumptions.

3. What, thirdly, is the level of curriculum integration?
At one extreme, we find the medical school which is essentially
a loose association of courses. Having arrived at some decision,
in a bargaining process, of what units of instruction are
necessary to produce an M.D., each unit is left to function
in a vacuum. Teaching unit, examination, finish; next.
Having performed adequately in each event in this decathlon,
the student can be given his union card. Second, we find a
pattern of a relatively high degree of horizontal integration.
The curriculum itself is divided into three levels: basic
sciences, clinical sciences, and clinical practice. One
hopes that the biologist talks to the physicist, the anatomist
to the pharmacologist, the pediatrician to the internist; certainly nothing less than this makes any sense in this pattern. The third possible pattern is that of vertical added to horizontal integration. In this case, all units of learning function as directly related to producing an M.D. and not only as preparation for the next stage of education.

4. The fourth social characteristic of the medical school which plays an important role in shaping medical education and the practice of the graduate is the place of clinical facilities in the curriculum. This has two aspects: timing and type of facilities. There are two opposite patterns, both of which are very much in disrepute, but we ought to give some thought to why they are so poorly regarded. First, there is the apprenticeship model, in which the student earns whatever he learns about medicine by working with an individual, usually an ambulatory practice physician. Second, there is the pattern of medical education as booklearning and exam-passing, postponing the encounter with clinical work till after graduation.

But, even if we dismiss these patterns, there are two major distinct alternatives. On the one hand, we find the pattern in which any contact with a patient comes only after a long, solid basis of academic understanding is laid, i.e., usually in the fourth year of studies (or in the second in the American system). This pattern is empirically, if not necessarily theoretically, linked with the hospital as the sole clinical facility. The student is by this time straining at the leash; untie him, we urge him on to become a crackerjack diagnostician and therapist, with the total focus of concern being the specific pathology. The major challenge becomes the dramatic, complicated case and the heroic fight of pitting medical science and technology against the disease.

On the other hand, there is the pattern in which the student is introduced to people - I use the word "people" rather than "patients" advisedly - at the very beginning of his studies. Knowing next to nothing about pathology, he is constrained to look at the person as a social being, and to learn to communicate with him. He learns about "sanitology" even before he learns about pathology. In this case, there is pressure to use not only hospitals but all of a community's health care facilities as teaching locations. Students are exposed to the more ordinary aches and pains, as well as the socio-emotional contexts in which they occur.
Health care system

In the two previous sections, I have considered various socio-cultural characteristics of the student body and the medical school which are inputs in shaping the kind of doctor we produce and what his medical practice will be like. I now turn to the third factor in the triangle, the broader environment and its health care system. I will again seek to identify a number of questions, the alternative answers to which are crucial to our problem.

1. All societies have a scarcity of resources and face the problem of allocation. The question I wish to raise, however, is not so much that of how much of a society's total resources are allocated to health care, but rather what is the priority level assigned to health care as a social responsibility? The alternative responses to this question underlie the more familiar question of medicine as therapy or medicine as health maintenance, prevention, therapy, and rehabilitation.

One model is that in which health care is essentially seen as a matter of individual, and not of social, responsibility. There is no room in this model for socially-controlled resources to be allocated to health care. The individual may do what he wants (or can) in matters of his own health. Contractual relations are between him and health care agents directly. A second model is that of "Medizinpolizei", i.e., in some realms - sanitation, environment, control of communicable disease - governmental agencies assume responsibility. Other than dealing with threats of a public nature, health care remains a matter of individual responsibility. Physicians are certainly involved in such a model, but they are largely separated from the mainstream of practitioners and may be looked down upon. The third social model is that which is based on the premise that health care is the inalienable right of a citizen, and hence it is the responsibility of government to make sure that it is available to all. This model is built on the same assumption as the model which requires the provision of social services for protection from outside enemies, criminals, fires, ignorance, or unemployment.

2. The second characteristic of the general environment which influences medical education and the work of the graduate is the structured organization of medical practice. Again, I would point to three theoretically alternative models. In real life, there may be, of course, mixtures of the three in any given society. First, we have the solo practice. Whatever the system of reimbursement, be it fee-for-service or some form of
insurance, the physician is a direct participant in a market economy, his business acumen being not much less important than his professional capacities. A second model is that of the centralized, bureaucratically organized system of health care. There are rules and regulations, resources and policies, which are largely well beyond the control of the individual physician, and his margin of autonomy is largely limited to the specific case for which he is assigned responsibility. The third possible model is that of localized group autonomy, in which the contractual relations are essentially between those of a given local population and a given set of medical practitioners.

3. Third, I would call attention to the prototypical cultural view of the appropriate doctor-patient relationship. For purposes of historical accuracy, we should take note of a model which is now largely out of mind and supplanted: the doctor as subordinate and even lackey. We are much more familiar with the completely opposite model: the doctor as at least God's representative on earth, if not the Deity Himself, with the power of life and death. In this case, the doctor is unquestioned, in total control, adored, self-policing, omniscient and omnipotent, applying his clinical brilliance and the weapons of medicine to save the life and restore the health of the passive, grateful, compliant patient. Another possible type of relationship is that of a partnership between two adults, one of whom is a highly skilled master of specialized knowledge and resources, the other of whom provides his personal strength, will, intelligence, and cooperation.

The final question we would raise about the environment of health care refers to the relationship between physicians and non-physicians in the provision of health care. This may be subdivided into (a) the relations between the doctor, other health workers, and others; and (b) the relations between those who deliver health care services and those who provide other welfare services. One model calls for the investment of authority and responsibility in the physician, who controls and directs other health agents. Alternatively, one can conceive of an integrated team, in which, at any given time and for any given problem, leadership is assumed by the most appropriate person, be it physician, nurse, medical social worker, psychologist, physiotherapist, etc. But the question is even more profound: is the physician, with or without other health workers, singly or in association with other physicians, the force which controls the health care system, or do community representatives and members of other professions, as well as the individual patient, share this power?
The second question of relations between physicians and others concerns the way in which health problems are viewed. On the one hand, they can be seen as sui generis. Health workers deal with health problems and do not concern themselves with other matters. On the other hand, health problems can be understood as being intimately intertwined with other problems. In this case, the health worker - and above all, the physician - is called upon to work with the educator, welfare agencies, etc.

Conclusion

My central thesis has been that medical education is a social phenomenon in the sense that its character, as well as the kind of doctor it produces, is shaped by the sociocultural characteristics of the host, agent, and environment, i.e., of the student, the teaching institution, and the health care system. With regard to each of the three areas of input, I have raised a number of issues which seem to me to be crucial. In each case, I have posed a number of alternative model solutions, some products of observation of reality, some products of theoretical analysis (or, I am willing to grant, perhaps of wishful thinking). Though I have raised twelve separate problems, I am fully aware that the answers suggested for each problem are not independent of answers to the other problems. To enter into a discussion of the links between the different answers, however, would require another paper. I opened the paper by taking the position that we medical educators do have some degree of autonomy in shaping medical education. I think this is particularly true with regard to the first two areas I have discussed, the student and the teaching institution. But we will only be able to exercise this autonomy meaningfully if we give serious consideration to the concrete sociocultural issues I have presented.

In closing, I would stress that if we limit ourselves to exercising autonomy in these first two areas only, we will meet with overwhelming frustration. We must remind ourselves that medical education is a means, not a goal. Our goal relates to the performance of our graduates. If we devote ourselves solely to selecting the ideal student and building the ideal curriculum - whatever our ideals may be - and dissociate ourselves from the health care system of our society, we will be dooming ourselves to failure, for we will be disregarding one of the three inputs - in my view, the major one - into the performance of physicians.
References


THE HEALTH CARE TEAM

E. Reerink

The concept of the health care team stems from the idea that medical care and hospitals are organized systems in the sociological sense of the word. We can look at health care systems in various ways - entrepreneurial, bureaucratic, craftsman, professional, and technical.

These approaches have been found insufficient in one degree or another. What seems to fit in best with current trends in professional organization and with demands for the specialization of functions and services is the team model. The central logistic problem in health care delivery is a human problem: can we effectively organize and coordinate all who have something to contribute to the care of the patient? Only through the resolution of this problem can we apply the full capabilities of scientific medicine to every patient in every community in a country. The team is an essential mechanism for the fulfilment of the expectations of society for comprehensive health care and it is, moreover, the setting for the first steps in sharing responsibility between the physician and other health professionals. Despite the difficulties inherent in any attempt to define what constitutes a health care team, some operational if arbitrary definition must be used.

In contrast to the definition used in group dynamics, a team is any group of persons cooperatively working together for the attainment of some defined goal. In the health care system, the team goal is the attainment of certain specific health care needs of individuals or communities.

There are a number of levels at which the team can function. These are distinguishable from each other on the basis of two things: the needs the team is designed to satisfy, and the degree of immediacy of contact with the people it serves.

Let me give you some examples. My wife and I are both physicians and, while taking care of our children, limiting this only to prevention, we form a fine team. I look for the facts and the truth, for which a university position is very suitable; my wife takes care of the implementation of our plans and of the maximum of compliance with the prospective patients (our children), and I evaluate our efforts by ascertaining that
there are no doctor's bills, no drug purchases, and invariably favourable reports from the dentist for a number of years now. Although I presume that this is not the type of teamwork you expect to hear me speak about during this meeting, I must say that this example contains the essential elements of teamwork, i.e., clear goals and objectives, a maximum commitment to the task, and evaluation.

I have selected three other examples out of the many possibilities for forming a team and functioning as one. Each of them involves clarification of goals and objectives and evaluation of the output. These are essential factors without which the success of the health team approach is seriously hampered, the result being misunderstanding, malfunctioning, or even rejection of the whole idea. The three examples differ with respect to the goals and the composition of the team. They do not even have success in common. The only thing they have in common is that they resulted from activities at one school - the Faculty of Medicine in Maastricht.

Georgopoulos, to whom this presentation owes much, distinguishes three levels of health team: the patient care team, the medical care team, and the health care team. The patient care team comprises any group of professionals, semi-professionals, and non-professionals who jointly provide needed services which bring them into direct personal or physical contact with the patient and which are part of a programme of management for that patient. Doctors, nurses, social workers, dieticians, and aides are examples of members of this kind of team.

The medical care team consists of those professionals, semi-professionals, and non-professionals who provide some needed service in the management of the patient which does not bring them directly or personally into contact with the patient. Examples are people working in the field of hospital administration, laboratory services, and others.

The health care team consists of all who are engaged in providing or planning for some service that will improve general or community health but does not require direct or indirect contact with the specific needs of a specific patient.

My first example concerns the patient care team. Some time ago, I received a request from a general hospital to advise on what they called a technical problem in the delivery of patient care. One of the physicians who was treating patients for carcinoma of the lung had the feeling that a considerable
number of patients disappeared during the long diagnostic process in the hospital. He also had the idea that the whole process of diagnosis and treatment was taking a very long time. From memory he told me that some patients spent 100 days in waiting until the tumour could be tackled either by operation or by radiotherapy. In general terms, this physician asked for help to evaluate the care he and his team were providing.

To our astonishment, we found that the 100 days' wait was not confined to a small number of cases, but represented the average over a given period of time. Of course, there were cases for which only 30 days' wait was necessary but they represented the - fortunate - minority. The reason for this apparent failure in organization was easily acknowledged to be the lack of a team. Each individual - pulmonologist, radiologist, pathologist, surgeon, radiotherapist, general practitioner, nurse, administrator, auxiliary health worker, and hospital director - did his or her job splendidly, but failed to coordinate it with the activities of the other team members.

When we got the team together - an impressive 15 physicians, nurses and others - we simply presented them with the finding of our evaluation study. The decision to stay together, form a real team, and improve patient care was made by the group. That the decision was sound was proved by a notable reduction in the waiting period during the first six-months follow-up in 1976. Patient compliance, i.e., willingness to cooperate, was increased through simple administrative and collaborative procedures which were discussed and agreed upon by the team. Out of this brief description of a two years' project comes the firm belief that the success of the team approach lies in the clarification of the goals of the team - what are they working for?; in the evaluation of the output of the group - how well did they perform?; and in the evaluation of the group's commitment to the task - how much did they care for their patients?

The second example, relating to the medical care team, may be described as follows. In our school we have abolished departmental borders and organized research on the basis of multidisciplinary teams. Through this process we have been able to have biomedical scientists and behavioural scientists work together on the same project. A well-developed example of these projects is sports medicine, in which the physiologist, biochemist, surgeon, psychologist, and sociologist - to mention a few participants - have joined forces. After one year, there is already a considerable output, not only on paper, but also in the form of effects on the surrounding community.
The third example stems from the educational system practised in our school, and it is one about which I have some reservations. After talking about the health care team as a sound concept to work with in order to attain certain goals in health care, it took just one small additional step to introduce the team approach in our curriculum. Here, the faculty had a number of educational goals in mind:

- to improve efficiency in learning
- to stimulate cooperation in learning
- to enable students to assess and help one another (peer learning and peer evaluation)
- to foster positive attitudes as to cooperation and collaboration in health care.

The better to achieve these goals, our students are expected to work in groups rather than on an individual basis. At a recent evaluation, we found that nearly all students of both classes approved of the team concept in their educational programme, but were quite unhappy about its functioning in reality: 20% of the senior class and 48% of the junior class judged present group activities as adequate. The school is still in the process of analysing the data, but the following may already be said now:

1. The goals set by the faculty were not clear. In fact, two conflicting approaches have become apparent: one is to ask for task-oriented team work, the other one is to comply with what we call "group dynamics", which the students sometimes perceive as "soft", "unclear", "dangerous" and "unnecessary".

2. The tasks provided for the students were not stimulating enough to start them working in groups. Students often met for 10 minutes to divide up the different tasks and subtasks and then left the room for individual study.

3. The health care team could not be perceived in the student team. Instead of the multidisciplinary teams we suggested, there are monodisciplinary student teams.

4. We really do not know what occurs when the groups meet.

Why did this happen? I think the main reason is that so far we have been unable to translate the goals and objectives of our curriculum into a variety of instructional methods, including team work. Instead, we have opted for one method of instruction, i.e., team work, and found out that a number of our
objectives were in fact incompatible with one another. We have learned from our mistakes, and plans to change and improve group teaching are already being discussed. We are confident that next year students will be working satisfactorily in groups to prepare themselves for team work in medical care.

After these examples, a few remarks should be made about two aspects of health team work: the first is leadership and decision-making, and the second evaluation. The key problem in the team approach is that of coordination, and task assignment in a well-formulated and accepted management plan. Most physicians do not as yet accept the idea of a shifting captaincy or of truly shared responsibility and decision-making authority.

Modern trends in leadership and management are often thought to be in conflict with most medical situations. There are many legal, ethical, cultural, and personal intersections, and they are of immediate significance in the current trend toward team care.

The evaluation of the team approach must employ one fundamental criterion: what is the effectiveness of the team's output in terms of services, techniques, and skills, in relationship to the needs of those served? The topic of evaluation opens up a whole new world, completely unknown to most physicians and of enough interest to have an entire conference devoted to it. It should be sufficient to state here - again - that the ultimate success of the health team approach is dependent on its evaluation. The health care team is a sound concept, and the reason that it has had little success up to now, is - I believe - lack of evaluation.

As you will have noticed, I have not challenged the concept of the health team itself. Instead, I have indicated problem areas in the health team approach for which solutions are urgently needed. I hope that this conference has shown that much has to be done, especially in improving the team approach in health care and, in a broader context, in educating the health professions in team work.
CONTINUING MEDICAL EDUCATION

G. E. Miller

With the decisive strokes of a master, Professor Prywes has painted a brilliant picture of the interplay between the forces generated by society and the programmes generated by medical faculties. Even more important, he has identified, with sometimes painful clarity, the choices we must make if as medical educators we are to exploit, rather than to neglect, the opportunities now before us.

My task is to focus attention upon the issues surrounding one segment of our responsibility, the continuing education of practitioners, in the context of his introductory remarks. It is no easy thing to do, for the period from the completion of a general or specialty qualification to the termination of a professional career is not only the longest span for learning, but also that which has in the past been subjected to the least formal definition or regulation. It is perhaps because of these two facts that it has aroused the greatest controversy.

Let me begin by describing the present state of affairs, at least as I see it, as a background for describing the future, at least as I believe it must be.

Whatever form our educational programmes in medicine may take I am persuaded that they do shape a physician product. Sadly, that shape in too many instances seems more compatible with an earlier age than with the needs and expectations of the contemporary world. At the risk of offending, but with the hope of provoking the discussion for which Professor Prywes' words should have primed us, I would like to suggest four characteristics of medical school graduates that seem to have been fostered by the implicit or explicit values of our basic educational programmes and which have profound influence upon the kinds of continuing education in which they will engage.

These graduates are first of all fact-oriented. They have from the beginning of their medical study been fed such a rich diet of facts, tested so regularly on their assimilation of knowledge, rewarded so handsomely for demonstrating an ability to repeat what they have been told, that they look upon further education as the accumulation of an ever-expanding lode of informational bits, not unlike the nuts stored by summer squirrels for the long winter ahead. The definition of
a specialist as one who learns more and more about less and less until he knows practically everything about nothing may be an exaggeration, but it does describe a climate of values which we seem to esteem in higher education.

Second, we condition graduates to be dependent learners. In a fact-dominated educational environment, the facts which must be learned are those espoused by the experts students encounter. It makes little difference whether other experts in a different school, or even a different division of the same school, favour a different view of the same topic. Students recognize very quickly that the right answer is the one they have been given, not one they may have found through the exploration of alternatives or the analysis of original data, despite our verbal commitment to the importance of scientific method. In fact those who engage in such independent study may find themselves penalized in examinations if they come to a conclusion different from that of their immediate teacher.

Third, our graduates have learned to prize autonomy. Their most common faculty model is one who has become expert by accumulating a vast supply of knowledge, which is dispensed to more junior associates and to representatives of other health professions and occupations, as well as to patients, all of whom are expected to do as they are told by the master without questioning his wisdom. There is a good deal of talk in our medical schools about team-work, but it is almost never talk of a team in which the captain can be anyone but a physician. I do not doubt that this position is taken selflessly, with confidence that physicians know best what is required for medical care, but I have growing doubts about the validity of such a perception.

And under such circumstances it should not be surprising that many graduates are unresponsive to social expectations. There is an honest and often unshakable belief among physicians that laymen simply do not understand medical problems and thus are in no position to make decisions about medical care. The sad truth is that a majority of the population in many developing countries, and a significant segment in some developed nations, often get virtually no medical attention because of the physicians' preoccupation with delivering what they regard as "quality" care to limited population groups. Even in those favoured groups the frequency of non-compliance with physicians' prescriptions is either unknown by practitioners or is regarded as the patient's problem, not the doctor's.
It is not unexpected, then, that those who offer and those who consume continuing medical education seem reasonably content with the familiar educational methods that characterize the university and teaching hospital experience through which they have passed successfully. The data accumulated in a 1973 World Health Organization questionnaire study that produced responses from 63 Member nations certainly suggest that continuing education, like that which preceded it, is: (1) fact-oriented (with programme objectives being determined primarily by physician interests or academic decisions about what practitioners need to know); (2) largely carried out in a manner that encourages passivity and dependence (lecture and demonstration were by far the most prominent vehicles for instruction); (3) likely to emphasize professional autonomy and isolation (fewer than 5% of the continuing education programmes were interprofessional in nature); (4) more responsive to professional interests than to social needs (there was rarely an assessment of programme impact upon accessibility of health care, morbidity or mortality, health care cost/effectiveness, or consumer satisfaction).

In the face of such observations and of growing consumer dissatisfaction with both the nature and quality of the health services generally available to those who need them, I am not optimistic about the potential usefulness of redoubling our efforts or of demanding that physicians participate in some specified number of continuing education courses each year. It is neither economically rational nor socially productive to attempt a general updating of physician knowledge at fixed intervals. Most of that knowledge, so prized by those who have generated it, is of little use to more than a handful of practitioners. It is the refinement of competence in dealing with the problems faced day by day, rather than knowledge of things that may be encountered only rarely, that demands attention. The commonplace things may not be as exciting to teachers who deal largely with medical problems others have been unable to solve, or who are busy pushing back the frontiers of medical knowledge, but continuing education addressed to defined and much needed practice competence rather than ill-defined and questionably needed academic content offers a far greater hope of serving the health needs of society.

But such an approach will require continuing education strategies and tactics that are very different from those now known in most of the world. It will demand the acknowledgement that such education is not primarily a process of providing answers for questions never asked, but one of helping physician
learners discover a need to do something different in order to practice their profession more effectively. Discovery must then be followed by assistance to the now ready learner in satisfying that need through independent study that may use a variety of learning resources. And, finally, physician learners must be rewarded for the renewed or refined competence they acquire, not for the time they have invested in continuing education.

But it is unrealistic to expect that such a programme can flourish, or can even be successfully initiated, unless basic medical schooling is significantly changed. If medical students are to become continuous and independent learners whose goal is that of contributing to the health of society, then they must acquire during medical school the attitudes and skills that will ensure such an outcome, even at the cost of limiting exposure to some of the information now taught (and which the most candid teachers acknowledge is largely unused, if not forgotten). Four such components of professional competence need to be fostered and nurtured if this goal is to be achieved.

The first of these is the skill of perceptive listening. It seems to be true in most developed societies that the majority of those who seek help from physicians are the "anxious well" rather than the "organically ill". They need a thoughtful ear and understanding reassurance more than diagnostic tests and pharmaceutical remedies. But an even more important element of listening may be that of hearing the distant drums, the silent cries of the rural poor, the urban slum dwellers, or the Institutionalized old people whose health needs are too rarely exposed to physicians in face to face encounters.

The second is that of feeling. Our educational emphasis upon scientific objectivity needs to be balanced by some measure of social subjectivity. Without feeling, the values of science may displace the needs of people. The physician who feels those needs may recognize an incapacity for personal action, but will at least value the potential contribution of others and will, more often than is at present the case, seek their help in caring for individual patients or groups.

The third is analysing. Stimulus-response patterns, which any objective observer of the educational scene in medicine must acknowledge are what we now teach and test students on, are simply inadequate in the complex interaction between physicians and patients, whether the task is management of individual illness or preservation of community health.
Continuing Medical Education

The analysis of variables, the consideration of alternatives, the willingness to test hypotheses rather than leap to conclusions are essential components of effective physician behaviour. They cannot be learned in an environment where having a definitive answer for every problem is most highly prized and most generously rewarded. They are best learned in a setting where teachers have learned how to listen.

Finally, the quality of becoming. If medicine is lifelong learning, as increasing numbers of writers insist, then a medical student or a physician is always in the process of becoming something better. Yet, as it is currently organized, medical education resembles a discontinuous set of essentially unrelated episodes, each complete in itself, rather than a planned continuum. There is rarely perceptible continuity from course to course in medical school, or from event to event in continuing education. But an even greater impediment may be the lack of encouragement for students or graduates to test new roles or new patterns of health service delivery by giving up some facet of traditional physician responsibility to another health worker who might be able to handle it more effectively, or seeking the help of other professions for the organization of more efficient or effective methods of health care. Humility is not among the most notable characteristics of our profession, yet it is the essential ingredient of honest self-assessment which is at the heart of continuous learning.

Can these things be taught or, more important, can they be learned? I am confident that they can, for there is little question that education is a social phenomenon as well as an intellectual exercise. The principle was most succinctly formulated more than 2000 years ago when Plato noted, "What is honoured in a country will be cultivated there." If we honour in medical school or in continuing education only those who are successful course-takers, then we cannot reasonably grieve because they have not acquired a professional competence compatible with the needs and expectations of a changing society. The mathematician/philosopher Alfred North Whitehead has said, "There is nothing so useless as a merely well-informed man." To make our graduates more than that, the spirit of continuing self-education must be at the heart of the process for which as teachers we are responsible. Such a fundamental change in our behaviour as faculty members is surely difficult, but it is because we wish to do something more meaningful in fulfilling the social responsibility of medical education that so many of us are here this week. It remains to be seen whether we will be successful in translating our hopes into action.
Despite the intensity with which medical education has been examined it has remained relatively immune from external criticism. With little variation the goal of our faculties and institutions has been to promote the scientific and practice skills of medical graduates, stressing clinical knowledge at all times, addressing themselves to the community aspects of health care frequently but always as a subsidiary, essentially forced item for consideration. Every agenda dutifully includes the concepts of health teams, physician substitutability, preventive rather than curative medicine, and access to services. Yet to this day hospitals and clinical professors are dominant, extending their fiefdoms in familiar directions, defending their roles with the theme of better quality in patient care. It is not my purpose to raise serious questions about the validity of this concept. On another occasion it could be useful to examine afresh the orthodox empiricisms on which we base clinical practices, searching for evidence of statistical soundness, for measures of effectiveness, for records of practices once highly accepted but later found to be faulty, in general measuring the extent to which scientific discipline is applied to medical care dogma.

Rather, let us review the relationships between the socio-political movements of our times and the specific phenomenon known as medical education.

As you know, the USA has made every effort to maintain both private medical practice and academic institutional independence, while doing through government only what more seems necessary. On the bright side, this arrangement has led to strikingly high levels of professional competence, has fostered biomedical research of great consequence, and has made available to many the most advanced kinds of life-sustaining technology. On the darker side, it has contributed to the factors that so rapidly push up the costs of medical care. We have multiplied the numbers and kinds of specialties, leading in turn to new and expanded laboratories, sophisticated technology, supplementary training, added beds restricted to specialty uses, and then more specialties. Public expectations have shifted from dignified death to replacement of any or all deficient organs. There appears to be ample evidence that the
technological advances of medical science and the associated practices contribute to the rise of health care costs. The most striking example may be the growth of dialysis and kidney transplant, but other examples abound.

There is no established upper limit for any nation's budget beyond which it cannot or will not go to pay for health care. There is a capacity for socio-political resistance, however, beginning with a quiet voice saying "That's enough", which, if unheeded, becomes a very loud voice demanding an end to imputed excess. In the USA we may have reached the end of our fiscal tolerance at the present 8.3% of the gross national product. It is not just that our health bill is $1.25 billion, or more; there is an associated belief that the costs are unrelated to public benefits, that neither quality nor access to care have improved enough to merit more than a portion of the staggering added expenses.

What does this have to do with medical education - with the years when the future physician acquires his skills, habits, attitudes, and professional concepts? The answer depends on what these and other physician characteristics have to do with the nation's health bill. A widely supported thesis is that physicians overwhelmingly influence or directly control all aspects of health care, certainly the costs. No one argues that, individually or collectively, the medical profession's membership is even minimally prepared to manage a major segment of the economy effectively.

Not long ago, the US automobile industry, represented by General Motors, Ford, and the Chrysler Corporation, asserted that each automobile sold in 1975 would cost $775 extra because of the medical benefits the companies had to pay out. They also asserted that medical payments were the most rapidly rising and uncontrollable expense in their factories and assembly lines. Somehow that isolated observation impressed those who had not yet recognized the many ways in which we are taxed for medical expenditures. It may be that the entrepreneurial character of medical practice in the USA sets it apart from other countries as a unique contributor to national health care costs, though this is doubtful. But the US does provide an opportunity to examine some of the consequences of medical practices that flourish free of cost control, without a method for calculating or for monitoring overall fiscal consequences.
With little or no imposed restraints, physicians make all of the critical decisions that determine the health bill. These include: (1) who will be seen as a patient, (2) how the diagnosis will be made, (3) what added examinations are required, (4) where the examinations will be made, (5) how the diagnosis will be determined, (6) what the diagnosis will be, (7) what the treatment will be, (8) who will be associated as members of the team or consultants in patient care, (9) whether or not the patient will be placed in a hospital or other institution, (10) how long patients will remain in the hospital - in or out of bed, (11) what drugs or procedures will be needed in the treatment, (12) how frequently the patient will be seen, (13) what will be done to maintain or interrupt continuity of care, (14) what procedures will be used to extend life among the dying, (15) what kinds of records will be kept and (16) what the fees will be. A formidable list, but not exaggerated. Further, in the absence of unusual circumstances, those who prescribe drugs or examinations of all kinds are unaware of the costs or, if aware, generally not deeply concerned. Only recently have physicians in the USA even learned about daily hospital bed rates. Consequently, it has been necessary to introduce mild, indirect controls to try to encourage the efficient use of expensive facilities. It is not surprising, with the history of the unchallenged right of physicians to determine what is best for the patient, that extensions of fiscal reality into their protected worlds are looked on with suspicion and hostility. Appropriately, the provider of medical care at his clinical best has always concentrated unwaveringly on what is needed for the patient before him. It is extremely difficult with that tradition to attract professional attention toward the competing demands of overall medical accountability for the effectiveness with which the profession fulfils the totality of its unwritten social contract.

It is the aggregate behaviour of individual physicians which accounts for most of the allocation and utilization of a nation's resources for health services. The collective daily choices of physicians represent myriad opportunities to affect costs, usually in ways which, viewed independently, may seem trivial. There is little likelihood that choices will or can be made to include a clear cost factor consistently. On the contrary, it is more likely that the presumption of better quality - new technology, highly touted drugs, a recent laboratory tool - will be favoured despite associated costs so long as there is the expectation of even a minor advantage to be gained. Further, there is no way in which any clinical decision can reflect how this added expense or diversion of human resources will affect those denied health benefits
because resources are diverted away from them, again a factor that is huge in the aggregate, minuscule in the particular. One way of estimating this effect is based on the expectation that each new physician in the USA now adds at least $200,000 to the annual costs of medical care. We have no data on what reductions would ensue if choices were consistently made of the least expensive of adequate services for all or even a modest number of patients. In any case, what the new physician elects to do is the direct product of his education, subsequently fortified by the behaviour of his colleagues in practice.

There is no reason to believe that the medical profession is indifferent to medical costs - on the contrary, physicians as a group fully recognize the need to reverse the upward trend in national health expenditures. Unfortunately, there is nothing in their education or other experience to guide them towards effective alternatives to current practices. It is fair to say the medical profession does not see itself either as a part of the problem or the means to a solution. An even greater sense of remoteness exists in institutions responsible for medical education where it might be heresy to teach students how to make clinical decisions based on relative costs. Certainly nothing suggesting an epidemiological approach to clinical practice seems likely to emerge from the hospital wards as currently conceived and managed.

It may well be that medical education should be confined to sharply constrained technology transfer with a modicum of social science to humanize it and some biological background to provide discipline. It is difficult to visualize any early change in faculties that would cause them to carry out a painstaking examination of their responsibilities for the corporate problems of medicine. If the graduates of medical schools are to maintain the attitudes and habits of their predecessors, we may find ourselves devising new methods for making vital decisions affecting the health of the community. As the forcing factor in these decisions is economic, the solutions found will certainly emphasize fiscal control coupled with strenuous efforts to secure maximum service benefits. The ultimate goal will always be to maintain and improve health status for all.

It is obvious that what is most expensive or technically most advanced will not necessarily be most worth preserving. It is less obvious that what is commonly done in practice may not necessarily be what should be preserved when financial resources are shrinking. If the profession
broadens its scope to offer its best judgements on these issues to the community and to the nation, this will lead to stress among many medical practitioners.

As education is meant to prepare minds for what lies ahead, educators must recognize and anticipate the rapidly altering demands of our times. A modest first step will be to accept the validity of the socio-political realities just summarized. A reasonable subsequent step should be the exercise of critical judgement directed at institutional practices by academic faculties. What follows may for some be a rededication to orthodoxy, for others a redefinition of purpose around broader issues. In either case the inevitable conclusion will be that medical education should not encourage any drift towards isolation; rather, it should vigorously establish its place within the communities it serves. We must not produce physicians prepared to offer services which the nation and its people cannot afford.
SUMMARY OF THE PROCEEDINGS

A. Gellhorn

Advances in biomedical knowledge and technology, together with significant socio-economic improvements, have dramatically changed the patterns of disease frequency in the developed countries, with the virtual eradication of the major causes of death in childhood and a consequent increase in the proportion of the population living to the seventh decade or longer. This is in sharp contrast to the affliction of the majority of peoples in the developing countries, who still suffer from the communicable diseases and the effects on health of extreme poverty.

With the control of the devastating plagues in the developed countries, attention is directed toward improvement in the quality of life through the maintenance of health and the prevention of disease, without losing sight of the continuing concern for basic medical research and the curative treatment of the major causes of morbidity and mortality which have supplanted the infectious diseases in importance. On the other hand, the developing countries will have to continue to focus their resources on the elimination of those disease problems for which the health solution is known and encourage national and international research on those endemic and communicable diseases affecting large population groups for which effective control and preventive measures are still not known. The importance of international cooperation as a manifestation not only of altruism (for which there is distressingly limited evidence in the world today) but of enlightened self-interest has been demonstrated by the elimination of smallpox in essentially every part of the world and the consequent possibility of reallocating resources previously required to prevent the disease to other areas.

The damaging conditions of modern life create a bad social, economic, and physical environment that affects all peoples of the world to some extent. The resulting manifestations of ill health include alcoholism and other forms of drug abuse, disturbances in mental health, poorly defined conditions associated with atmospheric and environmental pollution, developmental abnormalities consequent on malnutrition, psychosomatic illnesses, and many others. These common societal problems must be met in order not only to promote health but also to help prevent the occurrence of the chronic disabling and killing diseases. The medical profession has
not grasped its unique opportunity to exert a positive influence as regards this increasingly significant aspect of health and disease and in this it has failed to meet its responsibilities.

Before analysing the factors that have contributed to the inadequacies of the medical profession and medical education in meeting contemporary health needs, it was recognized that the medical profession is by no means solely responsible for health. It is but one part of the larger social organization which must work as a whole to achieve better health for everyone, from the individual to the family, the community, the nation, and ultimately all the peoples of the world. The physician, nevertheless, through his professional education and his trained observation of health and disease, could play an important role in identifying problems requiring social and political action and in providing individual and community health services which could maintain health and prevent disease.

Participation in the Ulm Conference was confined to the representatives of international medical organizations and invited speakers from the medical profession and it may therefore not have identified those problems of health needs, the health sciences, or medical education that non-medical critics would consider important. Nevertheless, there was a consensus that the following factors contribute to existing shortcomings in meeting the health needs of society:

1. The last thirty years have witnessed the development of a major maldistribution of doctors within the medical specialties, so that there is serious overspecialization and a pressing need for general internists, general pediatricians, and family physicians who, individually or in groups, can provide first contact and comprehensive and continuous primary medical and health care.

2. There is a serious maldistribution of physicians geographically in both developing and developed countries so that people in rural and inner city poverty areas lack adequate health care.

3. There is an overemphasis on curative medicine with the result that the overuse of hospitals and of increasingly complex technological diagnostic and therapeutic procedures is driving the cost of medical care beyond what is reasonable in terms of value rendered; and this occurs at the expense of the application of known means for the prevention of disease or the early identification and treatment of disease before it becomes progressive and chronic.
4. There is a need for shifts of emphasis in the area of biomedical research. The current exclusive concern with fundamental biological phenomena and the modification of the natural history of advanced disease should be balanced by the investigation of factors in community health, nutrition, the health impact of environmental pollutants, human behaviour, and the interactions between and within social institutions that can lead to change.

5. The health care system should be more accessible and more decentralized. It should look more to the total situation of people and be more community-centred.

In considering how to correct a number of the recognized deficiencies in health care and in health manpower, the Conference recognized that a significant cause of these deficiencies is a lack of coordination between the authorities responsible for health care services and those responsible for the education of health personnel, including physicians. In the absence of cooperative planning, health manpower needs are not met. There is no evaluation of the effectiveness of health care in the improvement of health and there is no feedback to medical education to signal the important health problems with which the future physician must cope.

One can frequently observe the inadequacy or even non-existence of national health manpower policies, leading to the absence of a well conceived national health manpower system which is an integral part of the existing health system. The gravest and most frequent problem here is lack of coordination of the planning, education, and management of health manpower and also of these three aspects and the development of health services. Thus, the education and training of health manpower often develops quite independently from what might be needed and may be planned, quantitatively and qualitatively, for the health services. The problem of lack of proper planning and coordination is even further complicated by the fact that health services insist, more often than not, on highly sophisticated, centrally located medical care which unduly emphasizes the curative element to the detriment of the preventive, promotive, and rehabilitative aspects and which is frequently quite unrelated to local realities.

There is quite obviously a need for the integrated development of health services and health manpower. The Conference identified certain aspects of medical education that, within this framework, require urgent attention. These included:
1. Reform of pre-medical education so that it contributes rationally to medical education and provides an appropriate background for those who may elect to take up careers in health professions other than medicine, and offers for all students a reasonable education for good citizenship. To implement the recommendation the following measures may be considered:

(a) To redesign the courses in the natural sciences so that they provide the necessary sufficient foundation for understanding the basic medical sciences. This will guide the definition of needs and help to reduce the amount of unrelated material and the over-emphasis on science in the pre-medical curriculum.

(b) To develop courses in the social sciences covering concepts of health, the physical, social, and economic environmental factors that are contributory to good and bad health, and the health care system of the country and, if possible, including field work to introduce the pre-medical student or those interested in other health careers to the realities of health and health care.

2. Reform of the selection process for admission to medical schools so that it is sensitive to the needs of the community and compatible with the resources available for education, and also avoids the overproduction of physicians. Among the factors important in the implementation of this recommendation are:

(a) Planning that relates health manpower development to the needs of the health services. This would cover the practising physician, the physician-scientist, and the physician-teacher.

(b) The development of criteria for the selection of students that are more rationally related to the desired product. It is considered probable that, after basic academic requirements had been met, differing selection criteria would be applicable for the future physician-scientist and the practising physician.

(c) Limitation of the number of admissions to medical education so that physical and human educational resources are not overwhelmed and wastage of time and money due to a high rate of attrition among medical students is avoided.
3. Reform of the medical curriculum so that it is adapted to the health service needs of the nation or community. Many factors are involved:

(a) Definition of the objectives of medical education on the basis of the health needs of the population.

(b) Improvement of interrelationships between the basic medical sciences and clinical medicine by the early introduction of students to the health problems of the community and of individuals.

(c) Definition of time allocation to courses on the basis of objectives, and with the recognition that the facts learned will change and that the process of education must be continuous, not episodic.

(d) Insistence on student experience in practice settings other than the university hospital and preferably in community health practice including an ambulatory health care facility. This is intended to emphasize the importance of primary health care and requires well qualified supervision.

(e) Restoration of balance in the curriculum so that the emphasis on promotive, preventive, and rehabilitative medicine is equal to that on curative medicine.

(f) Provision of instruction in health education of the public.

(g) Introduction of courses or discussions on ethical issues in clinical medicine and biomedical research.

(h) Introduction of an innovation in the examination of students' competence by testing their ability to identify and solve health problems related to the health needs of the population.

(i) Insistence on the critical evaluation of educational innovations through longitudinal studies by qualified educational researchers.

(j) Recognition of the importance of teaching and curricular innovation through the academic reward system.

(k) Stimulation and encouragement of students, through interdisciplinary cooperation, to become generalists.
(1) By means of seminars and discussions with political scientists, politicians, science policy makers, community leaders and others, the education of students in their potential roles as agents for change through cooperation with other sectors of society. The aim is to demonstrate the function of physicians in improving the health of the population through social change.

(m) The provision to medical students of experience in working cooperatively with other members of the health team in the provision of primary health care.

The CIOMS Conference then asked itself, "If we think we know many things that are needed to improve health and medical care and we think we know at least some ways to achieve the desired ends, why don't we apply this knowledge?" The participants identified a number of problems or obstacles impeding change in medical education and health services. These are listed in Annex I.

At the end, the Conference underlined the fact that medical education is making a positive and valuable effort to produce physicians who are able and ready to meet community health needs, to restore the balance between general and specialized medical care, and to redirect the medical profession from its one-sided disease orientation to health orientation. The Conference made these final recommendations:

1. That a summary statement be prepared, in advance of publication of the proceedings, for circulation to the participants and CIOMS membership.

2. That the topic of medical education and the role of the CIOMS membership be placed on the agenda of the 10th General Assembly in November 1976.

3. That CIOMS prepare an application for research funds to study the causes of resistance to institutional change in medical schools and the processes whereby these may be overcome.

4. That CIOMS prepare an application for support of an interdisciplinary group of medical educators and representatives from the social sciences and humanities to define an appropriate course for medical students on ethics and the social aspects of health.
Summary

5. That CIOMS make application for funds to study the communication pathways between health service authorities, practising physicians, and medical educators.

The CIOMS Conference in Ulm adjourned with the consensus that the free and candid discussion by representatives from all parts of the world had increased understanding and had provided an incentive to medical education to meet the challenge of the health needs of society.
ANNEX I

SOME OBSTACLES TO CHANGES IN MEDICAL EDUCATION AND THE HEALTH SERVICES

I. Medical schools

1. The autonomy of institutions and of departments within institutions, leading to resistance to educational change to meet needs for health care.

2. Overemphasis on medical science and the treatment of diseases, leading to neglect of education on the meaning of health care.

3. The absence of generalists and primary care physicians on the teaching staff and overexposure to specialists so that primary health care and necessary role models are not given proper emphasis.

4. The absence or inadequacy of training in the communities where health problems exist.

5. The failure of medical schools to participate in the primary medical and health care of communities.

6. The absence in medical education of input from the community and from the social sciences such as law, economics, sociology, etc., which are relevant to health and disease.

7. The imbalance between instruction in disease compared with instruction in health and between instruction in hospital care compared with instruction in community primary care.

8. The lack of coordinated experience between medical students and other professional and auxiliary health personnel through which the student could learn how to function as a member of a health team.

9. The need for greater emphasis on solving problems of health and disease rather than on memorizing facts.

10. The academic reward system which favours scientific research achievement over teaching ability or community health research.
11. The lack of teachers who conceive their responsibility as that of facilitating learning and encouraging their students to become socially conscious health workers.

12. The absence of mechanisms to guide the career choice of the medical school graduate towards those activities that would best serve the health and medical career needs of the country.

13. The lack of organized continuing medical education and medical school contact for medical personnel in remote or under-served areas, which hinders the appropriate distribution of doctors; also the loss to society resulting from failure to provide continuing education for women physicians who have interrupted their careers to raise families.

14. Failure to place sufficient emphasis on preventive medicine, occupational medicine, nutrition, mental health, gerontology, rehabilitation, and the common health and medical problems of the population in contrast to those diseases requiring secondary or tertiary care.

II. Public policy

1. Prescription of the number and quality of students to be admitted to medical schools, without reference to the resources or the purposes of medical education.

2. Dictation of the curriculum, thereby preventing innovation and experimentation.

3. Establishment of examinations or credentializing processes that prevent curricular changes.

4. Failure to establish national health goals and needs.

5. Lack of clearly defined communication pathways between the authorities responsible for education, those responsible for the planning and administration of health services, and the physicians delivering health care.

6. Failure to provide feedback from health services on the performance of medical school graduates.
III. International health and education

1. Inadequate participation of scientific researchers and public health workers from the developed countries in work in the developing countries, so that the rate of progress in the solution of pressing health problems is unnecessarily slow.

2. The failure to exchange educational information and results of educational experiments between developing and developed countries, to the detriment of all.

3. The failure to define primary health needs and major disease problems in developing countries in such a form as to guide the reorientation of physicians and their training.

4. An insufficient effort to develop national medical scientists who will concern themselves specifically with national health and medical problems.

IV. Medical specialists and their organizations

1. Resistance to the education and recognition of generalists, because of vested interests.

2. Failure to identify and teach those aspects of their specialties that are important in the education of a generalist, such as maternal and child health, promotion of family planning, diagnosis and treatment of low back pain, common skin diseases, etc.

3. Failure to analyse the need for additional specialists in their own fields.

4. Resistance to the use of auxiliary personnel in the delivery of health and medical care.
PART 2

SCIENTIFIC SESSION
OF THE
10th GENERAL ASSEMBLY OF CIOMS
Geneva, 10 November 1976

Chairman: Professor A. Gellhorn

The first part of the Scientific Session was devoted to the problem of medical education as regards new health needs of society and represented the follow-up of the 10th Round Table Conference in Ulm. The summary of the proceedings of the Conference which ends Part 1 was distributed to all members of CIOMS. They were asked to consider the medical education issues raised at the Conference as they affected their disciplines and to send prepared comments to the General Assembly or have their representatives participate in the discussion.
Participants

Professor F. BAUMANN, Department of Physiology, School of Medicine, Geneva, Switzerland

Professor W. J. CURRAN, Lee Professor of Legal Medicine, Harvard University, MA, USA

Dr P. DAYER, Division of Pharmacology, Cantonal Hospital, Geneva, Switzerland

Dr A. DONATH, Assistant Professor, Division of Nuclear Medicine, Cantonal Hospital, Geneva, Switzerland

Professor A. GELLOHORN, President of CIOMS (Chairman)

Dr H. GOODMAN, Director, Office of Research Promotion and Development, World Health Organization

Professor D. KLEIN, Director, Institute of Medical Genetics, University of Geneva, Switzerland

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OPENING ADDRESS BY Dr T.A. LAMBO, DEPUTY DIRECTOR-GENERAL, WHO

I am very happy to welcome the Tenth CIOMS General Assembly to WHO Headquarters. The agenda for your Scientific Session, which includes two important questions of great importance to many of us, namely medical education and biomedical ethics, shows that you have much work to accomplish in the short time available, and I shall therefore make my remarks as brief as possible. I should like to exchange with you here a few thoughts on these two subjects and to give you a brief outline of WHO's interest and concern in them.

The most conspicuous health manpower problem in most countries is the inadequacy of health manpower systems to respond to the requirements of health care delivery for the entire population in the context of their social and economic development. This in turn results from inadequate health manpower policies that are not yet geared to a meaningful coordination of the different elements of the health manpower process, namely, planning, production, and management of health personnel.

Furthermore, health manpower plans, when they exist, do not always serve as a basis for formulating educational objectives leading to a definition of the content of the teaching/learning process. Frequently there is also a lack of communication between the producers of health manpower in the training agencies and the users of such manpower, the service agencies, and therefore the former cannot possibly assess the relevance of training to the job requirements of the latter. As a matter of fact, most countries have failed to reconcile the academic interests of universities and training institutes with the political and administrative interests of governments.

A number of associated problems in the field of medical education will undoubtedly attract your attention, and I shall mention only some of them. Most countries suffer from a shortage of training facilities and a lack of attractive working conditions. There is often a lack of security of tenure, limited access to continuing education, and absence of other sources of job satisfaction, which account for a limited capacity of countries to retain those trained. Also, few training institutions have as yet attempted to bring about integrated education and training of health teams. The extensive outflow of health workers from developing to developed countries is a symptomatic manifestation of both the irrelevance of training to health needs and demands for service by the population, and the unsatisfactory working conditions of the graduates.
There are currently a few examples of efforts by countries in the right direction, focusing mainly on improving the coordination of the different elements of the health manpower process and on innovations in the methods and content of training to make it more attuned to local conditions.

The need for greater concern on the part of medical educators to produce physicians sensitive to the health problems of the people to be served was emphasized at your conference on medical education in Ulm in July this year, a conference which WHO co-sponsored. CIOMS, with its roots in the nongovernmental, professional associations, has the potential to direct medical education towards a more relevant pattern than that at present existing in many parts of the world. I am pleased to inform you that WHO has a considerable interest in this matter and stands ready to work with CIOMS in order to achieve the desired goal.

While the Constitution of WHO requires the Organization "to promote improved standards of teaching and training in the health, medical and related professions", it is silent on the subject of medical ethics. Interested as you all are in world affairs and especially in international health, you are as aware as I am of the growing stream of new reports that reflect a common concern. It is said that medicine, which could act as a powerful instrument of social change, has been turned into a formidable instrument that constitutes a threat to basic human values such as dignity, equity, liberty, and security.

Ethical problems in medicine have always existed. But today these problems are more urgent and more definite, because new developments in biology and medicine and new technologies inconceivable before now have expanded the possibilities available to us, creating at the same time a wide range of serious problems threatening the intrinsic rights and values of human beings. You are all familiar with the complexity of the issues created by the clinical experimentation of new diagnostic and therapeutic measures, and of new tools for the prevention of disease and ill-health. The search for, and establishment of, safeguards has, therefore, become of growing concern to national as well as international authorities.

A significant indication of the existing concern is the fact that courses on the ethical dimension of medicine are increasingly becoming an integral part of the medical curriculum.
Medical schools in many countries now offer such courses at both the professional and pre-professional levels, as is the case in Australia, the United Kingdom, the Netherlands, Sweden, USA, USSR, and Hungary.

WHO has in recent years been increasingly involved in ethical questions. The Organization is, however, well aware that it cannot act alone on any aspect of the broad field of bioethics, which, though primarily a matter for the health professions directly concerned, is also of deep concern to society as a whole.

We therefore welcome very warmly the interest that CIOMS has shown over the past decade in various aspects of bioethics. Your increasingly important activities in this field have been of great value to WHO.

CIOMS has devoted a number of studies and convened meetings relating to this subject. The proceedings of your conferences dealing with human experimentation, heart transplantation, drug evaluation, the social and ethical implications of recent progress in biology and medicine, and human rights, have been published, and your Council has issued a number of resolutions relating to these subjects. I very much hope that CIOMS will continue to play a leading role in the promotion of studies and research in this field.

In the field of medical ethics WHO is particularly concerned with the effect of scientific and technological developments on human rights. Bearing in mind the mandate of the Organization and the fact that health is a fundamental human right, the Twenty-third World Health Assembly in 1970 requested the Director-General to prepare a document dealing with the health aspects of human rights in the light of scientific and technological developments, and to study further the implications of this matter for WHO. Following this request, a study was made concerning the implications for the rights of the individual of interventions, compulsions, or restraints performed or imposed on human beings for preventive or curative purposes or with a view to advancing knowledge of health and disease.

On such questions as ethical guidance in biomedical research, WHO leans heavily on the resources and assistance of nongovernmental and other organizations, in particular the Council for International Organizations of Medical Sciences and the World Medical Association. As you know, collaboration is under way...
between CIOMS and WHO on the manner in which the Council's activities in the field of bioethics might be expanded, thus permitting the development of guidelines for Member States in compliance with the wishes of the World Health Assembly.

The WHO Advisory Committee on Medical Research keeps the question of the ethics of medical experimentation involving human subjects under constant review. This Committee, at its session in 1975, requested WHO to enlarge its activities in connexion with the preparation of guidelines on specific aspects of research on human subjects. The Organization has already engaged in similar activities, namely, a study of the principles for the clinical evaluation of drugs, which covered ethical and legal aspects, and the preparation of guidelines for the evaluation of drugs for use on man. A conference, co-sponsored inter alia by WHO, CIOMS, and the World Medical Association (WMA), was held in March 1976 on the role of the individual and the community in the research, development, and use of biological substances.

You will be interested also to know that, in 1971, WHO established an internal secretariat committee to advise on research proposals involving human subjects.

In response to an invitation from the United Nations General Assembly, WHO has prepared, for the Fifth United Nations Congress on the Prevention of Crime and the Treatment of Offenders, a paper on health aspects of avoidable maltreatment of prisoners and detainees. This document presents an approach to the problem, outlining the various situations in which the health of prisoners and detainees may be involved, the implications for prison health services of some of these situations, and the extent to which WHO is involved in relevant ethical considerations.

I should like to mention here the active role CIOMS is taking in the study of this complex and highly controversial question, to which the United Nations General Assembly has invited WHO to give further attention. We are glad that you have agreed to help us again and to undertake a study on the modalities of a code of medical ethics relevant to torture. The World Medical Association has already reacted very positively to our request for advice on this problem.

Finally, I would also like very briefly to mention our joint programme on international nomenclature of diseases, which is a continuation of previous collaboration in the field of medical terminology.
Chairman: Thank you very much, Dr. Lambo, for your comments and for your charge to us in CIOMS not only for the activities of the next two days but for the succeeding years. We hope that we can meet the challenge and that the relationship and collaboration with WHO will continue to be as close and fruitful as it has been.

We will now proceed to the next paper, and we are fortunate to have the Assistant Director-General of WHO, Dr. Tejada-de-Rivero, who will speak on development, health, and medical education.
In the last few years medical education has become a key subject in health circles. Last July, as you know, the CIOMS discussed it at its Round Table Conference in Ulm, and it is again one of the subjects of this Tenth General Assembly.

It was obvious, both from the presentations made at the time of the Round Table Conference and from Professor Alfred Gellhorn's summary statement, that medical education is a complex matter which has close interrelationships with many other important social areas.

The participants in the Round Table Conference in Ulm went systematically through all the main problems and prospects of medical education. They took a searching approach that is revealed in the subjects of their papers: medical education as a social phenomenon; implications of the economic and political aspects of the social environment on medical education; internal problems of medical education; the responsibility of preparing future physicians; and so on. All these fell within the scope of the title of the Conference: "Health Needs of Society: A Challenge for Medical Education".

It was said over and over again that in the majority of countries in the world (and not only those considered as developing ones) the whole health educational system (particularly the medical schools) is isolated from the health service system. Dr Halfdan Mahler, our Director-General, has recently expressed the view that in many countries medical schools and faculties are ivory towers, preparing doctors not to care about health but to see only disease and the technology for dealing with it; to cure rather than to prevent; and to look at episodes of disease instead of at the whole person within the society, in permanent interaction with it.

Professor Gellhorn's summary statement pinpoints, too, among other things, the maldistribution of physicians within the medical specialties; over-specialization; geographical maldistribution, not only between developed and developing countries but also within countries; overemphasis on curative medicine; the overuse of hospitals; the increasingly complex diagnostic and therapeutic techniques that are driving the
costs of medical care beyond a reasonable value-return; and the failure to apply known means for the prevention of disease, and for early diagnosis and treatment.

All these points constitute one more demonstration of today's awareness in the field of medical education. Medical education must now move from disease to more positive aspects of health; from individual-oriented medical care to community-oriented and society-oriented health care; from the individual practice of medicine to a multidisciplinary team approach; from isolated action by physicians to a more adequate combination of professionals, auxiliaries, and extra-professionals. And, finally, we must move from a medical education oriented towards excellence to one that is relevant to the health needs of society, and we must reject restrictive "professionalism" in favour of the new social role of physicians and other health workers.

One of the final messages of the Conference at Ulm was the recognition that the need exists for an integrated development of health services and health manpower and that medical education has to be oriented in relation to the needs of health services. Today I should like to go a little further and relate medical education to overall social and economic development and to health in its broader social sense.

I should perhaps clarify what I mean by the concepts "development" and "health". In the past, these two ideas have been used in very narrow and incomplete ways. A look at their present meanings may help us to understand the need for changes in medical education, and indeed the need for health manpower planning in general, which will have to look far beyond our present-day health service systems.

Development is a concept that has undergone a permanent process of change in its interpretation, particularly in the last thirty years. Nowadays development is considered to be much more than economic growth and industrialization. The days are over when it was measured simply in terms of gross national product, income, and other per capita average economic growth indicators. Today we can see around us countries that show very high per capita average indicators of economic growth, but which are obviously underdeveloped - and will continue to be so, unless they change their development strategies. On the other hand, there are countries now achieving self-sustained development for all segments of their populations that have not given the highest and almost exclusive priority to industrialization, and still in fact have low
Development

per capita average indicators of economic growth. In the Third World, there are still other developing countries that show significant economic growth but, precisely because of that growth, have significantly increased the existing gap between the upper and lower income-groups of their population. This unbalanced economic growth has made some of these countries much more dependent economically and politically, which only reinforces the barriers to their self-sustained development in the future. It is no exaggeration to say that in some instances economic growth without development, and artificial and externally dependent industrialization, have made the rich minorities of these countries richer and the poor majorities even poorer.

Economic growth has had a significant influence on many other aspects of social organization - the patterns and functioning of the health service system, for example. The geographical maldistribution of physicians, the excessive proportion of specialists, and the concentration of medical care in big cities and in highly sophisticated expensive hospitals are all signs of the overall social and economic situation, as reflected in the health sector.

Development is not one fixed and unique model, nor is it a process that can repeat itself in imitation of what happened in the developed countries. Development and underdevelopment are so closely related that the development process as it took place in affluent societies will never be repeated in developing countries. Furthermore, models of development must be significantly different from country to country, especially in the economically and politically dependent Third World. Events have shown in recent years that the classical stages of development as conceived at the beginning of the 1950s were only theories, and could not be carried out or reproduced in practice.

All countries have to formulate their own models for development, based on cultural and life values, political philosophies, and political alternatives. They have to design their own strategies for realizing these chosen models over the long term. And they have continuously to adjust their strategies to everyday circumstances, because they exist in a world context of permanent change. Development as a social process requires social goals; therefore so-called economic and social actions - which have their own goals and targets - should and must be considered as a means and be oriented towards development
and its social goals. In a worldwide context, the main social
goal of development could be the satisfaction of basic human
needs by the end of the century. This social goal of world
development then has to be interpreted and translated into
the different economic and social sectors, including health.

The concept of health has also passed through a process
of change. Health as simply the absence of disease was
superseded by the WHO definition of health in the 1940s
Health as medicine, and health as health services, are in-
complete and misleading ideas that appear to be already
behind us, at least in principle. Health reduced to the
conventional administrative limits of the "health sector"
within the bureaucratic structure of a country is another
misleading and incomplete approach.

In his various speeches during the last few years, our
Director-General, Dr Mahler, has been making a plea for a
philosophy of health related to development. He uses the
concept of "health development" and, accordingly, "national
health development processes". I quote: "Health development
is both contributing to and benefiting from overall social
and economic development." In this way, health is not only
the responsibility of the health sector but "requires a
truly joint effort of the social and economic sectors con-
cerned".

The conventional and traditional health resources are
in fact not the only resources allocated by society for
health development purposes. This visualization of health
in a broader and social sense has many implications,
especially for health planning and, within it, for health
manpower planning. For one thing, health planning seen from
this angle reveals more clearly its content of political and
social processes. In the same way the goals to be reached
in health can be recognized as mainly social goals, closely
related to the social goals of overall development.

Social health goals will vary from country to country,
depending on the country's social and economic development
policies, but not passively following the economic and other
social sectors. On a worldwide basis the translation into
health terms of the overall development goal of satisfaction
of basic human needs at the end of the century would mean,
for example, the total coverage of the world's population
with some kind of relevant health service before the year
2000.
With this in mind, we must recognize that medical education has to be related to health services. But given these new concepts of development and health development, the meaning of "health services" changes completely.

Professor Gellhorn stressed in his summary statement that "education and training of health manpower often develops quite independently from what might be needed and may be planned, quantitatively and qualitatively, for the health services". In the same way, health services also often develop quite independently, or are even completely divorced from what might be needed and planned for a relevant national health development process.

To limit health manpower to meeting the needs of present health services would only be to consolidate even further the inadequacy of these services in relation to the social health goals of the world of today. This is why medical education has to be adapted to the development models of individual countries and has to plan its contribution in advance for the achievement of these countries' social goals.

Chairman: Thank you, Dr. Tejada. You have raised a number of important issues which I hope we will have the opportunity to discuss in the course of the afternoon. Before beginning our open discussion, however, I should like to call upon Professor F. Baumann, Professor of Physiology at the School of Medicine of the University of Geneva, who will talk to us about some of the problems of medical education at that school.
QUELQUES PROBLÈMES D'ÉDUCATION MÉDICALE À L'ÉCOLE DE MEDECINE DE GENEVE

F. Baumann

Je n'ai pas l'intention de faire un long discours sur l'enseignement et les problèmes que pose cet enseignement à la Faculté de Médecine à Genève. Je souhaite que ma contribution à votre réunion serve de base de discussion et j'aimerais connaître votre avis - l'avis de spécialistes de la formation de médecins - sur les problèmes qui nous préoccupent et que nous n'avons pas résolus. Je voudrais vous parler d'un sujet que nous appelons à Genève et en Suisse la réforme des études de médecine. Autour des années 1960, un groupe de jeunes professeurs se penchaient sur les problèmes de la formation médicale en Suisse. Il s'agissait pour eux de savoir si la forme des études de médecine d'alors correspondait bien aux buts de la formation que l'on désirait pour un futur médecin. Ce groupe d'enseignants de la médecine avait l'impression que de nouvelles disciplines devaient être introduites dans le curriculum de médecine. Les médecins que nous formions étaient de bons cliniciens, de bons internistes, de bons pédiatres, de bons psychiatres, mais souvent ils avaient une formation insuffisante pour résoudre, par exemple, les problèmes psychologiques, très simples, dont souffraient bon nombre des malades qu'ils rencontraient dans leur cabinet. Ils étaient souvent incapables de s'occuper d'alcooliques ou de toxicomanes, souvent ils ne savaient pas comment s'occuper d'une personne âgée, dans quel home on pouvait la mettre, quels soins on pouvait lui donner. On avait l'impression très rapidement que le médecin suisse avait une formation insuffisante pour résoudre un très grand nombre de problèmes qu'il rencontrait dans sa pratique courante. Il avait une formation insuffisante en médecine préventive, en hygiène industrielle, en gériatrie, en médecine sociale, en psychologie médicale. Il semblait donc que l'introduction de ces nouvelles disciplines dans le curriculum était indispensable à la formation d'un futur médecin.

Il y avait d'autres problèmes qui nécessitaient une réforme des études de médecine en Suisse. Les sciences précliniques, la physiologie, la biochimie, la morphologie faisaient, depuis la dernière guerre, des progrès très rapides. Nous commençons à comprendre comment fonctionne...
le rein, comment fonctionne la rétine, comment fonctionne le cortex visuel, et les enseignants, avec beaucoup d'enthousiasme pour leur science, avaient envie de communiquer les découvertes les plus récentes à leurs étudiants. Tout paraissait important pour la formation d'un futur médecin et pourrait servir comme base de la physiopathologie et des sciences cliniques. Le résultat de cette évolution fut que l'enseignement devenait de plus en plus dense et de plus en plus difficile à assimiler par les étudiants. Pour vous donner un exemple, quand j'étais étudiant en médecine, le professeur de physiologie consacra à un phénomène - l'impulsion nerveuse et sa propagation le long d'un être - douze heures de cours. Nous avions tous l'impression que c'était un sujet horriblement difficile. Nous consacrions beaucoup de temps à assimiler le cours. Nous avions beaucoup de discussions avec le professeur. À la fin, nous comprenions ce que c'était une impulsion nerveuse. À présent, nous consacrons quatre heures d'enseignement au même phénomène.

Il y avait d'autres raisons encore pour justifier une réforme des études de médecine en Suisse. Certains sujets, dont l'étude était demandée pour les examens, n'avaient plus aucune importance pour la formation d'un futur médecin; par exemple, la systématisation des plantes n'avait plus aucun sens et devait être laissée de côté. Les étudiants se plaignaient aussi de ne pas avoir un contact suffisant avec les malades, de ne pas avoir un enseignement suffisant au lit du malade.

Finalement, à la suite de toutes ces discussions, un arrêté du Conseil fédéral rendit possible en 1969 une réforme des études en médecine en Suisse. Cet arrêté disait: "Pour éprouver de nouvelles méthodes d'enseignement et d'examen, des dérogations expérimentales au règlement des examens fédéraux pour les professions médicales sont autorisées. Les programmes sont établis par les facultés, de concert avec le Comité directeur (le Comité directeur en Suisse est nommé par le Gouvernement), puis sont soumis à l'approbation du Département fédéral de l'Intérieur." Cet arrêté avait effet jusqu'au 31 décembre 1975. Les facultés en Suisse avaient donc six ans pour réformer les études de médecine. Les conséquences de cet arrêté ont été des discussions, des discussions ont succédé à des discussions, des rapports de commission se sont enchâinés à de nouveaux rapports de commission (j'exagère un tout petit peu) et le résultat de toutes ces discussions, le résultat de la réforme des études de médecine en Suisse (et c'est triste) est que la durée
des études de médecine a été réduite de six ans et demi à six ans; certaines branches sont examinées à l'aide de questionnaires à choix multiple au lieu d'être examinées oralement; on a introduit une année d'études à choix, c'est-à-dire que pendant une année un étudiant en médecine en Suisse est libre d'étudier ce qu'il veut, il peut aller chez un médecin praticien, il peut travailler dans une clinique, il peut faire de la recherche. L'examen final, à la fin des études de médecine, a été partagé en deux, c'est-à-dire qu'on peut en faire une partie à la fin de la cinquième année et une partie à la fin de la sixième année.

Voici la question que je me pose et que j'aimerais discuter à la suite de cette introduction: pourquoi la réforme des études n'a-t-elle pas réussi en Suisse? Et je voudrais ouvrir une parenthèse pour ceux qui ne sont pas familiers avec l'organisation des études en Suisse afin qu'ils puissent suivre mon exposé. En Suisse, deuxinstances sont responsables de la formation médicale: ce sont les facultés et le Gouvernement. Le Gouvernement définit dans un règlement la durée des études, les noms, les dates et la forme des examens et les branches qui doivent être enseignées et examinées. Les facultés ont la liberté d'établir des catalogues d'objectifs, de dire ce qui est enseigné. Elles ont également la possibilité d'introduire de nouvelles branches mais qui ne seront pas examinées parce que ce n'est pas écrit dans le règlement.

Pour quelles raisons n'avons nous rien changé à la formation des médecins et est-ce qu'une réforme des études est nécessaire? Si on consulte les enseignants de médecine, si on consulte les politiciens, si on consulte les étudiants en médecine, tout le monde est d'accord qu'une réforme des études de médecine est indispensable et urgente. La surcharge des étudiants dont j'ai parlé au début et qui existait il y a dix ans est devenue plus grave encore. L'étudiant n'a plus le temps d'assimiler ce qu'on lui enseigne, beaucoup d'étudiants sont obligés d'apprendre par coeur ce qui est enseigné pour pouvoir passer les examens. Nous constatons de plus en plus que peu de temps après l'examen un étudiant a oublié tout ce qu'il cibles que j'ai mentionnées au début et qui ne sont pas enseignées ou insuffisamment, comme la médecine préventive, la gériatrie, la psychologie médicale, l'hygiène industrielle, la médecine du travail, toutes ces branches manquent dans notre curriculum, ou il y a seulement un embryon d' introduction à ces disciplines. Tout le monde est d'accord, il
faudrait les enseigner si nous voulons former ces médecins qui sont capables de s'occuper de la population et des problèmes que pose la société.

Sur le plan suisse, je me demande: Est-ce la faute de notre système si la réforme des études n'a pas réussi? Est-ce le partage de la responsabilité de la formation des médecins entre le Gouvernement et les facultés? La possibilité dans un tel système de s'accuser mutuellement, de se rendre mutuellement responsable des échecs de la réforme des études et de se disputer au lieu de construire. Finalement, je me demande: N'est-ce pas la faute des enseignants si la réforme des études n'a pas réussi? Une réforme des études, une réorganisation du curriculum, nécessitent du temps, beaucoup de réflexion et beaucoup de travail. Et là je deviens accusateur. Beaucoup d'enseignants n'ont pas pris au sérieux la réforme des études. Partagés entre leurs tâches administratives, leur tâches d'enseignants et de chercheurs, très souvent ils ont préféré la recherche et l'administration à leurs fonctions d'enseignants. Je leur trouve une excuse. On ne peut pas tout faire. Et je les réaccuse parce qu'on doit décider ce qu'on peut faire. Si en Suisse les enseignants avaient décidé: je vais faire de l'enseignement et j'abandonne la recherche, peut-être qu'à ce moment-là on aurait mieux réussi cette réforme des études, qui a été un échec.
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Chairman: Thank you, Professor Baumann. I feel confident that some of the items you identify as deficiencies are not peculiar to Geneva: they sound reasonably familiar to me and I wonder if this would not be the case for many of us. Now, I would like us to begin the discussion, and there are a number of individuals who have indicated that they wish to be heard. I should like to recognize Professor J. Papavassiliou, Dean of the Medical School at the University of Athens and Secretary-General of the Ninth International Congress on Tropical Medicine and Malaria.

Professor Papavassiliou: Greece is a subtropical country. Many tropical diseases - for example, malaria and other parasitic diseases - have disappeared from it. However, from many points of view (medical, political, social, industrial development, etc.), Greece is a "borderline" country, sharing characteristics of both developing and developed countries. This is the reason why I have decided to add a few brief remarks to the summary by the President of CIOMS.

The majority of the important factors of inadequacy in meeting the health needs of society have been discussed in the Ulm Conference. The first is the maldistribution of doctors. In Greece the ratio of doctors to the total population (1973) was 1/540, but 71.7% had set up practice in the Greater Athens area (including Piraeus) and in Thessalonica. The doctor-population ratio was 1:260 in the Athens area and 1:290 in Thessalonica; in some of the rural areas it was one doctor to more than 1,500 persons.

Out of a total of about 17,000 doctors, nearly 50% are not specialists and work as general internists. The family physicians have disappeared in the bigger towns. The number of general practitioners in rural areas is low. The needs of the health services in rural areas are so great that every young doctor, soon after graduation, is obliged by law to work as a general practitioner for one year in a rural area. This measure, introduced 15 years ago, did not solve the problem of medical and health care in rural areas because the majority of doctors return to the big medical centres for specialization.
The country is divided into 52 departments. A general hospital exists in the capital of each department but the number of beds, of doctors, and of nurses is not sufficient to ensure total health care coverage of the population. In the Athens and Thessalonica areas, however, the number of hospitals, beds, and doctors is satisfactory. Athens and Thessalonica have medical schools; a university career is an attractive prospect for young doctors.

Patients from all over the country come to the two main towns for diagnosis and treatment. It is also significant that (a) 50% of the hospital beds (out of a total of 57,000 beds for the whole country) are concentrated in the Athens area and (b) out of a total of 28,500 hospital beds in Athens, 40% belong to private institutions or doctors and are thus not available for the teaching and training of medical students.

The medical school of Athens, for the last few years, has been trying to reshape courses in the natural sciences so that they may provide the necessary and adequate basis for understanding the basic medical sciences. Nothing is done to "develop courses in the social sciences covering concepts of health, and the physical, social, and economic environmental factors are contributory to good and bad health", as recommended in the summary of the proceedings of the Ulm Round Table Conference.

A written entrance examination is still required in Greece for admission to medical schools. This year a total of 8,300 applicants were registered for a total of 400 vacant seats in the country's two medical schools: until 1975, the number of admissions was nearly 600. This number, however, can be increased by at least 50% if we include (a) foreign citizens (mainly from Arabian and African countries), (b) Bachelors of Science from other countries, and (c) Greeks born in the USA, in other countries, or resident in a foreign country.

The curriculum of Greek medical schools is more or less similar to those of the continental West European countries. Practical exercises and clinical experience in hospitals during medical studies are not satisfactory because of the great number of students. The teaching of theory in rather large classes is, however, good. Young Greek doctors feel that they do not have enough experience to work as general practitioners or as family physicians immediately
after graduation. This is one of the reasons why they prefer to follow postgraduate training for specialization. The medical schools and the curricula are supervised by the Ministry of Education.

Doctors work for 3 to 5 years in university or State hospitals, supervised by the Ministry of Social Welfare. At the end of this training period, the head of a specialized department (e.g., surgery, internal medicine, pathology, etc.) gives a testimonial to the candidate, who then sits for an oral examination before a committee composed of three specialists appointed by the Ministry. Many specialists, trained in the country, need to follow further courses in the developed countries.

Most probably, many other "borderline" countries have to face similar problems. Moreover, it is very difficult to attract young doctors to specialize in public health or to work as public health officers. Salaries for the public health officer are very low, starting with US $400 per month, while a good surgeon in private practice can earn this amount for one operation. Courses in preventive medicine and public health have never been popular among medical students. At the present time, no-one is interested in specializing in parasitology or tropical medicine.

Finally, I should like to make the following suggestions:

1. Medical schools in developing or borderline countries should include rural medicine in the medical curriculum.

2. In the non-tropical developing or borderline countries, as well as in the developed countries, the medical curriculum for undergraduate students should include courses in parasitology and tropical medicine. Courses on imported infections are now becoming very important for medical students of developed countries.

3. Schools of hygiene and preventive medicine could be created in countries where they do not exist. They are of special interest for solving health problems at the national level. Better salaries and facilities for research work should be provided for public health officers.

4. Postgraduate training is necessary for generalists, general pediatricians, and family physicians.
5. A permanent committee on medical education should be established in those countries where undergraduate studies are supervised by the Ministry of Education and postgraduate studies by the Ministry of Health.

Chairman: Thank you very much indeed, Professor Papavassiliou. You have raised further questions and observations of enormous interest, and I hope that in the course of the afternoon you will have some responses concerning experience in various other countries or among other members of the Association on several of the issues you have raised. Now, I would like to recognize Professor J. Ulrich who represents the International Society of Neuropathology.

Professor Ulrich: I am the representative of the neuropathologists, and neuropathology is probably considered by most of you to be a special product of overspecialization. For many years neuropathology actually had been a difficult discipline, one for superspecialists, interesting only to clinical neurologists and psychiatrists. These were usually condemned to therapeutic passivity. This changed radically, however, with the development of neurosurgery and with the insight that many neurological conditions are just one aspect of a general disease. Furthermore, the development of virology, profound insights into the molecular biology of genetics, into the structure of membranes and the role played by enzymes, and the whole advent of modern cytology, armed with ultrastructural and cytochemical techniques, have contributed to take neuropathology out of its ivory tower. Neuropathologists now have to read frozen sections for the neurosurgeon during operations, to explain neurological complications of liver diseases, and to explore toxic neuropathies, sometimes occurring as sequels of alcoholism and of certain occupations. They also play an important role in research on viral diseases, such as poliomyelitis, and the so-called slow virus diseases, or in genetic diseases such as sphingolipidosis. For all this there must be close cooperation with other disciplines, both the clinical disciplines and the basic sciences. For the neuropathologist himself, this means that he has to keep up not only with his own quite complicated field but also with what is going on in other biological disciplines. In a way, this may sound more complicated than it is. Modern cytology has brought so many disciplines together that, for example, the morphologist working on diseases of the nervous system will share problems with those working on single-cell lines, with cytochemists, or even with botanists.
What does this mean now for neuropathology during medical education? First of all, we think that it should be a part of the students' curriculum, one more speciality, we will say. We also think that it should be taught in a modern way. For instance, this mainly means explaining pathomorphology from a cytological point of view, with which the student is familiar from preclinical studies and from general pathology and microbiology. If we arrive at this, the undergraduate student can dispense with the many items he used to have to learn which used to be an essential part of neuropathology.

Compared with the entire field of medicine, my problems of neuropathology may seem to be of little significance, of course. Yet as I have tried to show, neuropathology is developing very fast and this development allows us to tie it up more closely with other disciplines, to teach it in a more simple way. Perhaps in this particular point it is similar to many other disciplines represented here and our problems of research and education might therefore be of relevance to you all.

Chairman: Thank you very much, Professor Ulrich. It may, I hope, come out in the discussion that many of the aspects you mentioned would not necessarily require a special course in neuropathology. Maybe they could be integrated at the appropriate times in general courses - as, for example, in the consideration of metabolic diseases in which the liver is involved with the toxic encephalopathies. But you certainly have made a number of very telling points, I believe, for all of us. Now I should like to call on Dr M. Fayot-Petitmaire, representative of the Medical Women's International Association.

Dr Fayot-Petitmaire: L'ALPM ne peut être qu'intéressée par le programme scientifique de la sixième Assemblée générale du CIOMS. Les sujets à l'ordre du jour n'ont pas, jusqu'à maintenant, fait l'objet d'une étude spéciale de sa part. Je me contenterai, à titre personnel, de quelques remarques.

L'enseignement médical est actuellement conditionné par deux données: l'une démographique, l'autre pédagogique.

Une augmentation rapide de la population locale dans certains pays doit s'accompagner, de toute évidence, de l'augmentation du nombre des médecins. Dans les pays développés, le nombre des médecins s'est accru.
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proportionnellement plus que la population globale, et le taux de médicalisation tend actuellement à dépasser un taux optimum.

C'est ainsi qu'en France le nombre actuel des médecins est évalué à 90 000, inégalement répartis il est vrai. La densité médicale globale est d'environ 170 médecins pour 100 000 habitants, soit environ 1 médecin pour 600 habitants. Au regard de l'augmentation de la population (environ 30% en 30 ans), la densité médicale a suivi une beaucoup plus grande progression (140% en 30 ans). Parallèlement, le flux annuel des jeunes bacheliers postulant aux études de médecine a cru de près de 3 fois en 12 ans, dépassant les possibilités d'accueil et de formation des facultés de médecine, d'où la nécessité de déterminer le nombre optimum des médecins et des étudiants en médecine.

Cette révision doit s'intégrer dans un étude générale des besoins de santé (individuels et collectifs), compte tenu de l'évolution sociale, des progrès scientifiques de la médecine, de l'évolution de la pathologie, du développement de la médecine préventive, de la tendance à la spécialisation de plus en plus poussée. En fait, les tâches nouvelles que doivent accomplir les médecins, le niveau scientifique et technique qu'ils doivent atteindre, nécessitent de toute évidence une adaptation et une réorganisation de l'enseignement médical (problème qui a été débattu à la Table ronde du CIOMS à Ulm en juillet 1976).

Les enseignements eux-mêmes ont dû évoluer rapidement. De nouveaux se sont imposés à côté des classiques. La formation scientifique a nécessité des enseignements de statistiques, de mathématiques, de biochimie, de biophysique, de génétique. La formation sociale a nécessité des enseignements de psychologie, de sociologie, et une intensification de la formation en médecine préventive.

Mais cette pédagogie nouvelle ne peut s'instaurer que si l'Université dispose des crédits, du personnel et des locaux nécessaires, et s'il existe un sélection des candidats aux études de médecine, sélection basée sur les possibilités d'accueil des établissements et sur les qualités souhaitables pour futurs médecins. Cette limitation du nombre d'étudiants permet la mise en œuvre d'une pédagogie nouvelle.

Toutefois, les modes et méthodes d'enseignement classique - leçons magistrales, travaux pratiques pour les sciences fondamentales, visites commentées au lit du malade pour les
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sciences cliniques, vie à l'hôpital avec des fonctions définies - ne sauraient être remises en cause. On tend cependant à réduire le nombre des leçons magistrales; les travaux pratiques sont facilités par les moyens audiovisuels modernes, et les manipulations sont organisées par petits groupes. A l'enseignement magistral on préfère l'enseignement dirigé: explications et discussions avec un petit nombre d'étudiants, auxquels a été distribué au préalable un texte établi par le professeur et qui ont dû se préparer à la discussion par des lectures appropriées.

La tendance a été depuis quelques années d'augmenter notablement l'enseignement des sciences fondamentales aux dépens de l'enseignement clinique, le contact avec les malades ne commençant qu'au milieu ou à la fin des études. Le parallélisme des études théoriques et cliniques me paraît plus souhaitable dès le début des études. L'enseignement des spécialités doit faire l'objet d'études spéciales dont la durée est variable, mais dans tous les cas la spécialisation ne doit intervenir qu'à la fin du curriculum normal. Les futurs généralistes ne semblent pas avoir besoin d'un enseignement spécialisé si l'enseignement de base qui doit être donné à tout futur médecin - la spécialisation ne devant être donnée qu'après coup - est satisfaisante et suffisamment approfondie.

D'ailleurs, qu'il s'agisse des futurs omnipracticiens ou des différents spécialistes, il importe de leur donner à tous une formation sociale. Il convient d'associer à l'étude des maladies celles des causes et des conséquences sociales. Il est nécessaire également que tous prennent conscience de l'importance de la médecine préventive et du rôle qu'ils sont appelés à jouer dans l'éducation sanitaire de la population. Il importe également qu'ils prennent conscience du coût considérable des dépenses de santé, de la nécessité d'éviter les dépenses inutiles, le médecin étant en grande partie l'ordonnateur de ces dépenses, d'où la nécessité d'un enseignement intégré de l'économie de la santé.

La deuxième partie du programme consacré aux applications éthiques et morales de la recherche sur des êtres humains intéressera vivement les membres de l'Association internationale des Femmes médecins, soit du point de vue général, soit en raison de la participation des femmes médecins aux programmes de recherche.
Chairman: Thank you very much, Dr Petitmaire. You have brought out a number of very valuable points and I think that each one of us would find them entirely acceptable. I just wish parenthetically to note that, as the representative of the International Women's Medical Association, Dr Petitmaire is a representative of a group that is rapidly growing, I dare say, in all countries of the world at the present time. In the USA, for example, the number of women in medicine and in medical schools has more than doubled in less than five years. In the entering class of 1976, over 40% of the admissions are women.

We have, to the best of my knowledge, one additional discussant who has asked to be heard and then I wish to open the entire area for general discussion. Professor R. Zetterström will present comments prepared by Professor Bengt Gustafsson, Secretary General of the Swedish Medical Research Council.

Professor Zetterström: The Swedish Medical Research Council agrees with the general statements that there is a mal-distribution of doctors in most countries and that there is a strong need for physicians trained to work in primary medical care and community medicine, such as general internists, general pediatricians, and family doctors. It is particularly important that the limited professionally trained manpower in developing countries should be directed towards preventive health care rather than highly specialized fields of curative medicine.

The Swedish Medical Research Council shares the opinion of many other European Medical Research Councils and of the National Institutes of Health in the USA that, in the field of biomedical research, the area of community medicine must develop parallel to that of the natural history of various diseases as well as that of the basic biological sciences.

In the Swedish Medical Research Council and in other Swedish agencies, means of promoting research of special relevance for the planning, organisation, and management of the health services, as well as for the evaluation of the efficiency and effectiveness of the health system, have been discussed during the last few years. As a basis for these discussions, the Council has decided upon activities aimed at promoting health services research, i.e., research on health needs and the efficiency of health care. While the Council is fully aware that research within this field has to be
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supported also by other agencies, it has the resources to contribute to the development of scientific methodology. The Council is also willing to take special responsibility for the training of research fellows in this field.

In addition the Council has decided to promote research in other areas of community medicine. Among these, the following may be specially mentioned:

(a) Patterns of disease and their relation to health needs. The results of epidemiological studies may give information about the importance of various environmental factors for the general state of health of a given population as well as of the health needs.

(b) Because of their importance for health planning, investigations are promoted on the demand for health care and how various subpopulations utilize the services offered by society.

(c) Studies to evaluate different organizational patterns for providing health care in a broad community perspective have been considered urgent. In the field of research on the economics of health, the development of economic techniques has obvious priority.

(d) The Council also promotes research to evaluate the cost-effectiveness of specific diagnostic and therapeutic methods in clinical as well as in preventive medicine. The Council has appointed special working groups to promote research in the areas of rehabilitation, perinatal medicine, the treatment of psychiatric disorders, orthopaedic surgery in degenerative joint diseases, and nursing care.

From this review of some of the activities of the Swedish Medical Research Council it is obvious that the Council is fully aware of the importance of the issues put forward in the statements made at the Ulm Conference and that it is now promoting research in various branches of community medicine. The Council, which has regular conferences with university authorities about how medical research can meet the needs of society also has the opportunity of giving its view on medical undergraduate and postgraduate education as well as the training of research fellows. There is general agreement that the way in which the curriculum of the medical school is outlined influences the research interests of the graduates.
In the summary of the Ulm Conference, the adaptation of pre-medical education and of the medical curriculum to meet the need for community health services is considered to be urgent. The Swedish Medical Research Council is of the opinion that most of the reforms listed in the summary have been carefully considered in Sweden and many of them have already been carried out. Recently there has been a reform of the selection process for admission to the Swedish medical schools which is rather similar to that proposed at Ulm. It will be interesting to see whether this change in the selection process will influence the direction of biomedical research.

The Swedish Medical Research Council has not noticed any resistance to institutional changes in medical schools in Sweden. For that reason, the Council does not consider research in Sweden on the causes of such resistance, and the processes whereby it may be overcome, of immediate interest. If such resistance exists in other countries, research to clarify its background may be of interest since it may mirror a much broader aspect of the cultural situation than just the limited problem of a rigid curriculum in medical schools.

The Swedish Medical Research Council supports the recommendation that research concerning communication pathways between health service authorities, practising physicians, and medical educators should be promoted. The Council also favours the suggestion than an inter-disciplinary group of medical educators and representatives of the social sciences and humanities should outline a course on ethics and the social aspects of health for medical students.

Chairman: Thank you, Professor Zetterström. And now I believe we can turn to informal remarks. I would first like to recognise Professor J. Cheymol, of the National Academy of Medicine of France.

Le Professeur Cheymol: Je voudrais indiquer très brièvement ce que fait l'Académie nationale de Médecine de France en ce qui concerne le problème qui nous préoccupe. Elle a, parmi ses commissions spécialisées, une commission qui s'occupe de la réforme des études médicales. Les travaux se poursuivent et les conclusions seront présentées en temps utile à l'Académie, qui les discutera et enverra ses conclusions aux pouvoirs publics dont elle est officiellement la conseillère. Je ne puis donc donner l'état de ces discussions, celles-ci étant réservées aux autorités de tutelle.
Il m'est cependant permis de dire que le problème du nombre des médecins à former la préoccupe beaucoup. Depuis 1968, le mot "sélection", sauf pour les grandes écoles, n’a plus cours dans notre pays, mais en fait celle-ci se poursuit, car elle ne peut être écartée. En France, elle est basée pour l’instant non sur le nombre des médecins du pays, ce qui serait logique, mais sur le nombre de lits de malades permettant des études valables dans les centres hospitaliers universitaires. Tout étudiant bachelier peut s’inscrire en faculté de médecine, mais un barrage est établi à la fin de la première année du premier cycle d’études et on peut dire qu’un étudiant sur quatre le franchit. Il vaudrait mieux évidemment que la sélection se fasse avant l’entrée en faculté et c’est l’objet de l’étude de savoir sous quelle forme - examen, concours - cette clarification du nombre d’étudiants devant poursuivre les études se fera.

Passons aux études proprement dites. Quatre points retiennent particulièrement l’attention de notre Académie. Le premier est le problème de la thérapeutique et de la pharmacologie, disciplines qui nous paraissent insuffisamment étudiées actuellement, ce qui est un véritable paradoxe alors que les médicaments sont de plus en plus actifs et chers et entraînent vite des réactions secondaires combien préoccupantes. Les pharmaciens ne se font pas fort de poursuivre la trace des actions combinées de plus de trois produits dans l’organisme animal et humain et nous voyons constamment des jeunes médecins, d’autant plus hasardeux qu’ils sont moins compétents, utiliser cinq, six, sept produits différents, ce qui est une source de danger considérable et de gaspillage d’argent incontestable. Deuxièmement, elle souhaite le développement de l’enseignement de la médecine préventive et de la médecine sociale, ce qui correspond à ce que vous avez souvent souligné. Troisièmement, elle étudie beaucoup les différentes formes qui permettront la formation continue du médecin. Pour la sécurité des soins, c’est en effet une exigence absolue, pour les facultés c’est une obligation institutionnelle (elles sont là pour ça) et pour les médecins c’est évidemment une obligation morale. Cette formation continue du médecin doit être à la fois organisée et contrôlée. Enfin, le dernier point que vous avez soulevé, et que tous nos collègues ont soulevé car il existe dans tous les pays, est celui de la répartition très difficile des jeunes médecins entre les carrières de spécialiste et de généraliste, un trop grand nombre d’entre eux optant pour celle de généraliste.
Chairman: It is interesting that Professor Cheymol mentions the problem of the admission to medical schools of a greater number of students than can be adequately trained. It is possible, it seems to me, that the meeting might, after deliberation, make a general recommendation that in all countries the admission of medical students be kept to the number that can be adequately trained. This might be of value for policy-makers in countries that would like to have such a restriction but find it difficult for political reasons. I would like to call on Dr B. Kwaku Adadevoh from the Medical Research Council of Nigeria.

Dr Adadevoh: One of our problems is that all specialties are very important. At least this is what we are told when the question arises. Each new specialty—and there are many of them cropping up every day—fights to get a place in the overcrowded curriculum in the medical schools. And, of course, each new specialty is very important—some of them tend to be more important than the traditional departments of medicine, surgery, obstetrics, and paediatrics. The curriculum itself is very crowded. We all say this all the time.

Listening to the President's own speech, I was attracted by the idea that medicine should be seen as coming from the level of the individual to the community to the nation and then to all the peoples of the world. I think I would like to stress the community aspect because, unlike what most people may think when we talk of community health, it in fact refers to the type of medicine that should be practised everywhere in the world and not necessarily in the developing countries alone. I think medicine is community medicine, anywhere you are. You must relate your patient to the environment he comes from; and I think that some of the problems which the developed countries have met with in the evolution of their medical practice occur because, in the last few years, or maybe in the last decade or two, over-specialisation in medicine has tended to concentrate too much on the individual, making use of all the fancy gadgets available for quick diagnosis, but often forgetting where the patient comes from.

There is another big problem, and that is teaching and motivating the teachers themselves for their new educational roles. I think most teachers are very resistant. The system of promotion in the universities enhances this, because the teacher finds that if he spends his time in research and publishes a number of papers he can get to be a professor more quickly than his mate who is more interested in student problems. Or a teacher finds that, by getting his specialty well-known, he becomes the pride of the medical school and the
students talk about him even though they may not learn much from him. Now, what I am trying to get at is that the solution, as far as some of us here see it, is to get involved in integrated teaching. Then the specialist will not see his subject in isolation from the other specialist subjects and the student will grow up in a milieu in which he sees medicine as a whole. I know that it is very difficult to integrate teaching but it has been done in some of the new schools. For those who do not know about it, Professor Monekosso and his team in Yaoundé are doing this. The advantage of integrated teaching is that it can take care of some of the problems that have been raised in terms of student/teacher populations.

We must not forget that most medical schools cannot staff their faculties in the basic sciences or in the preclinical sciences effectively. The problem is even greater in the developing countries. On the other hand, there are very good neurosurgeons and there are very good neurologists who can teach the physiology of the nervous system and perhaps teach it better in an applied way. So when we talk of teachers we generally ignore the question of student ratio. We have to bear in mind that we are probably only neutralizing some of the staff who do not belong to the traditional compartments or departments as we know them. Some of us, even though we have our specialities, have taught our course disciplines, and this is the sort of approach I am putting forward.

Finally, I think that, since the government or the consumer himself is not without blame, the government attitude to doctors is something to which medical educators have to give serious consideration. When a young doctor qualifies, irrespective of where he is but perhaps to a greater extent in the developing countries, he is thrown into the world and a great deal is expected of him even though he has done only one year’s internship. And for the developing countries, where there is an acute shortage of doctors, he is the obstetrician, he is the paediatrician, he is everything. Yet the same government will refuse to permit a situation like this, for example, in the area of external affairs. If you are to be employed as a young graduate in the foreign office of your country, the government has the wisdom to send you through an intensive training programme, perhaps because a favourable external image of the country is considered more important than the risk of a young doctor making mistakes in obstetrics.

Chairman: Thank you very much, Dr Adadevoh. I would like to call on Dr R. Cumming of the National Health and Medical Research Council of Australia.
Dr Cumming: I am speaking partly on behalf of the National Health and Medical Research Council of Australia but I must admit partially also from my personal point of view.

The remarks that I have heard this afternoon from the lead speakers and from the documents fit in very well with a number of developments in Australia at the moment. We have a number of curricular changes going on in our medical schools, and I must admit that I felt considerable sympathy with Professor Baumann earlier on when he talked about the competing pressures from teaching, administration, and research on the teachers in medical schools. This is something that is worrying us very much at the moment, and we are trying - with some success, I hope - to get the emphasis back on teaching. We have looked at the President's summary of the Ulm Conference and I must congratulate you, Sir, since I feel that this document is a most useful one that should get considerable distribution. We agree basically with most of the document, though we have a few minor points to raise.

I find myself in partial agreement with my Swedish colleague with regard to whether the resistance to change is all coming from within the medical schools. From our own experience in Australia, the resistance has not been quite so much from the medical schools as from the medical profession as a whole, feeding back perhaps into the medical schools. I was particularly taken with the annex to the summary statement and feel that particular attention should be drawn to the part that discusses the obstacles to change in medical education.

Regarding the absence of generalists and primary care physicians on the teaching staff, one of our problems is, of course, that our medical students do mould and model themselves on the teachers that they see revered and honoured within the medical school. I am afraid that, today, even when we have a department of community medicine within a medical school, the director of that department does not have the same prestige as those in charge of some of the older and more established specialties, and our medical students notice this.

I was particularly pleased to see international health and education dealt with in Section III of the annex. In this connexion, I am also particularly glad to see that we now have a representative of such a significant developing country of the Third World as Nigeria on this Council. His contribution brought home to us some of the wider problems that we in the developed world sometimes tend to forget, but they are problems...
that are common to all of the world and I think his statements were very salutary.

In the section of the annex that deals with international health, I notice that the last statement points out the lack of sufficient effort to develop national medical scientists who will specifically concern themselves with national health and medical problems. I think this is a particularly important statement. A number of us have for some years been concerned with the brain drain - the expression is so overused that I must apologize for mentioning it again, but one of the major problems here, and one of the major causes of the drain, has been the inappropriate training of medical graduates in the countries concerned. If medical graduates are trained for the job they are to do when they leave medical school, trained for the conditions of work into which they will go, the brain drain, I am quite sure, would be considerably diminished, and I think this point perhaps needs some further emphasis.

I think it essential to keep in mind the need for closer cooperation and closer links regarding the problems of the developing world and those of the developed world in the area of medical education, where, if we do nothing else, we of the developed world should try to make quite sure that new medical schools do not follow some of the mistaken pathways which we may have taken ourselves.

Chairman: Thank you very much, Dr Cumming. Your remarks are very helpful. I would only like to call attention to the fact that many of the comments that have been made this afternoon demonstrate that the problems of the so-called developing and developed world have more similarities than dissimilarities. Dr Adadevoh pointed out the necessity for physicians trained in Nigeria to be sensitive to community problems and equipped to deal with them. We are saying that in the developed countries many of our graduates are trained as specialists and are not adequately trained to deal in a broad sense with the common problems of the community. So in a way we have problems of the same kind. In any event, your comments are helpful in clarifying some of our concepts. I now call on Professor M. Bettex of the World Federation of Associations of Paediatric Surgeons.

Professor Bettex: I am speaking here on behalf of the World Federation of Associations of Paediatric Surgeons, and as you have already heard today from many speakers, the maldistribution, overproduction, and overspecialisation of physicians in
the world are very important problems. Our Federation was confronted with these problems many years ago and is now trying to find out how many paediatric surgeons are needed in any given community in order to plan the training of young paediatric surgeons. We realized very soon that the needs in a developed country are quite different from those in developing countries. In Europe and in North America paediatric surgery is very sophisticated, including open heart surgery, kidney transplantsations, microsurgery, and many other types of operation. In developing countries the needs are much more basic ones, and the training of young surgeons from developing countries in Europe or North America seems to be inadequate to meet them. We have observed two developments that are undesirable: first, on coming back to the countries of their origin, the trainees try to do the same sort of surgery they learnt with us, thus neglecting the basic needs of the population; or, secondly, they never go back to their country of origin but stay indefinitely in the highly developed country where they did their training. Both ways are wrong, of course. We therefore think that training should be organized directly in the developing countries by teachers sent into those countries to adapt paediatric surgery to the real local needs. The teacher must first be aware of the changed priorities. This new form of postgraduate training would have certain political implications, and our Federation would be glad to have the backing of the CIOMS.

Chairman: Thank you very much indeed. I should like to call now on Dr S.G. Browne who is Secretary-General of the International Leprosy Association.

Dr Browne: I feel somewhat diffident in addressing an audience composed principally of representatives of specialist medical organizations. In a way, and having worked for 30 years in Africa, I represent about three-quarters of the world's population who urgently need health care to be provided by medical workers conscious of the need to close the glaring gaps between what is known and what is being done. We in Britain, I readily admit, have not been conspicuously successful in educating our own medical students to deal with diseases imported by our population of one and a quarter million immigrants from the Third World or by the almost two million British residents who are every year exposed to the health hazards of countries outside the British Isles. The overburdened undergraduate cannot face any addition to an overfull curriculum, we are assured, as each specialty competes for the available teaching time.
The great scourges of mankind that the world faces are malaria, schistosomiasis, onchoceriasis, intestinal parasites, tuberculosis, and leprosy. What is the average medical student learning about these diseases, and their control and prevention?

We doctors have a grossly exaggerated idea of the importance of our influence on health and disease, on the well-being of populations. We are self-centred, self-satisfied, and . . . self-reproducing. Others may be able to have a greater effect on the community. May I put our discussion in the setting of the major problems that medical education ignores at its peril? These are:

1. the psychological and social attitudes to disease and health;
2. the essential contribution of the sanitary engineer - bringing piped water to households, and taking soiled water from them;
3. food and agriculture; soil conservation;
4. overpopulation.

Are the doctors of tomorrow being prepared to face these problems? Successful solutions will require an application of existing knowledge; an introduction of intermediate technology; a deployment of trained and supervised auxiliary personnel; health education that will change traditional life-styles and practices.

Thus, the future doctor must, in addition to having a knowledge of the indispensable basics, be a teacher, organizer, and supervisor of a health team, willing and able to enlist community participation, and thinking of water and food - its production and conservation, its preparation and distribution. It will not be easy to change traditional curricula, either in the industrialized West or in the countries of the Third World. Some few medical schools - in the west and in Africa - are experimenting along these new lines, but I fear that the new Heads of Departments are in many cases "plus royalistes que le Roi", as they subscribe to, and teach, the old subjects in the old way. This is a critical period in the history of many of these institutions. We must help them now.

But how? For us - as for them - an open-ended expensive system of highly developed curative medicine is impossible to achieve.
Discussion

For us - as for them - esoteric research may be interesting, even fascinating, but it may be irrelevant to local needs. I admit that new knowledge may prove to be invaluable, as in immunology and microbiology in leprosy; but poor countries simply cannot afford that kind of research.

For us - as for them - the greatest tribute to a teacher may not be a reproduction of his kind, but a stimulus to face the local problems with an enquiring mind.

This, then, is an ideal for medical education with special relevance to the developing countries: a multidisciplinary and community-oriented approach, despite the vested interests of practising physicians and specialists, and of politicians. And we, in the countries of the West, have a responsibility as we teach postgraduates from the other countries, to give them something that they can apply in their homelands, and to encourage them to teach this kind of medicine, not as an optional extra, but as an attitude incorporated into the whole medical curriculum.

Chairman: Thank you very much, Dr Browne. I should like to call on Professor Albert Renold of the Swiss Academy of Medicine.

Professor Renold: I cannot resist saying a few words in response to Dr Adadevoh whose point I think was well taken - that we need to take a more community-oriented approach to medicine - but he did imply that one of the difficulties was the resistance of teachers, and he mentioned especially young teachers who consider that they might be better served by accumulating publications and research than in teaching. Now I honestly do not believe that this is true. The idealism of the younger teacher especially is quite high, but younger teachers are also endowed with common sense and they resent having to spend too much time in arriving at what seems to be a simple and single modern idea of education and it is quite likely that there is no such thing. It is a function of government to state the aims of medical education as well as the aims of medical services. Once these are stated, then it is up to the teachers to implement the objectives. The greatest degree of autonomy must be given to medical schools in outlining their programmes, encouraging different models for achieving the goals of medical education. Younger teachers are rightly resentful of having to spend large amounts of time in committee to try to arrive at a single model when every one of us here knows that a single model does not exist.
Chairman: Thank you, Professor Renold. Professor T.M. Fliedner of the German Research Society.

Professor Fliedner: I think we should now turn to the question: how do we put all these nice thoughts into operation? One of the highlights of the conference in Ulm was when one of the delegates said, "All of what has been said has been said ten times over - and what do we do about it, what action is being taken?"

I think one of the first steps is to ask what are the health needs of a particular community and, more important, what are the health needs of the individual, because I think that we must not forget the very ancient, fundamental relationship between a patient and a doctor. That is the basis of all our activities and this is perhaps the reason why many of our young colleagues are somewhat reluctant to enter the fields of preventive medicine or of public health, because here this most ancient tradition of the patient/physician relationship seems to be distorted. In principle, the patient comes to the doctor and asks him for help to deal with a particular problem that he has. In public health and preventive medicine it is not the patient that comes to the doctor - it is the doctor who, on the basis of community action, has to do something, has to propose something, has to do some health education, has to conduct certain survey studies, has, in occupational medicine, to examine people to determine whether they are suitable for a particular job. This, at least initially, gives the young colleague a distorted picture of the physician, and it has to become clear at what point and in what way his is still a medical task.

So I think it then becomes very important to define what is the domain of the physician within a health care team. I was very much interested in the paper by Dr Papavassiliou who suggested the creation of schools of hygiene and preventive medicine. The question here is: what is to be the product of such schools? Physicians? If so, what then is the common basis of all people who call themselves physicians? We must define what a physician is and what he should know.

Chairman: Thank you, Professor Fliedner. I should now like to call on Dr D. Lehmann from the International Federation of Societies for Electroencephalography.
Dr Lehmann: I think the basis of much of our discussion is a general malaise about the way medical people treat their patients, and there appear to be two major problems: one is that there is too much money for too little health delivery; in other words, the patient or the patient's insurance company pays too much for what he gets in terms of health. The other problem is that the patient feels that he is falling into the hands of a machine instead of into the hands of a physician. We are all patients as we all, I suppose, have experienced this, namely being subjected to numerous highly complicated examinations whose final goal becomes blurred by an examination procedure that continues over days and days.

The remedy for the two problems is, I fear, not less education, but more education. The physician will have to become alert as to how much things cost and he will have to be told about it. We are very idealistic in our medical schools - we never talk about money. We are also rather generous in our medical schools - we quite generously apply examination procedures that cost a lot of money in instances when we know there is very little to be expected from our operations. The other source of concern - namely the feeling that the physician is merely the operator of a machine, or even disappears behind a machine - could, as far as I can see, be dealt with only by more psychology and more psychiatry in the medical man’s training. When it comes to telling people what is bad for them, preventive medicine has very little success if this is merely done in terms of statistics. People like to smoke cigarettes, to race cars, they climb mountains, they start wars. All these things are terribly dangerous for health, and they are being done all the time. Everybody knows that he should keep to a decent diet and that he should exercise, but nobody does it. Obviously it is not enough to tell people and to give them the figures - something else must be done. The only thing which I see is that we need more psychiatry and more psychology in our physician’s training. Now these two points are very much on my mind - this is my personal opinion and should not be taken as representing that of the Federation.

I have a last plea - I wish people would recognize the usefulness of research for teaching. I think a teacher who only teaches becomes a terrible bore within a very short time. Primary school teachers are good examples of this, and I think all of our money-making colleagues out in the country have at least once in their lives experienced a little bit of the excitement that research brings with it through reading lectures by someone who also does research. So I think we should have
an equal balance — that has been said before — between research and teaching and not only teaching.

Chairman: Thank you very much, Dr Lehmann. Dr M. Belchior of the Federal Council of Medicine of Brazil.

Dr Belchior: Mr President, I would like to say a few words about a point mentioned in your report, namely the lack of co-ordination in the planning, education, and management of health manpower and also between these three elements and the development of health services. At the time of the CIOMS meeting held in Rio de Janeiro in 1974 we had a definite lack of co-ordination in Brazil. But this meeting was attended by people in the Social Security Agency and the medical schools. The Social Security Agency is the greatest provider of medical care in Brazil and, because of this meeting and because of what they heard at the meeting, they decided to make some agreements, and under these agreements there is now a perfect correlation between medical education and medical care. The Social Security Agency is receiving medical students in its hospitals, and about 80% of the population in Brazil is covered by social security. So the medical students are having a chance now to see what they really are going to find in medical practice. This was a great achievement of the CIOMS, through the Rio meeting, and I am sure that you and the people in this group would like to know that.

Chairman: Thank you, Dr Belchior. Dr C.D. Burrell from the Sandoz Foundation, New York.

Dr Burrell: My background, incidentally, is also that of an Associate Clinical Professor of Medicine in New Jersey and I have been adviser to the American Medical Students Association, so I am not speaking really from the Foundation’s point of view.

A major problem that I see is the competition that exists for inclusion in a core curriculum. All departments in a medical school feel obliged, I think, to maintain or even increase the number of hours or days during which they have teaching contact with medical students. They do so almost as a means of justifying their continued existence, one feels. There has been a problem in the USA, and I presume elsewhere, with regard to fashions in medical education. The fashions at times have been related at one end of the scale to the availability of Federal funding, and thus indirectly to political pressure, and at the other end of the scale perhaps to the power of medical political pressure at the local level — the
power in fact of a head of a particular department in the medical school. Dr Adadevoh touched on this type of problem. To give you an example, though not a surgeon, I must confess to having been horror-stricken to learn from a recent past President of the American College of Surgery that there are eight medical schools in the USA from which a student may graduate without having had a single lecture in surgery, seen a single demonstration in surgery, been near an operating room, or indeed had any instruction whatsoever in surgery. In such schools, where the emphasis has been on community medicine, the curriculum has been so skewed as to create a disservice to the very people that are supposed to be served. It is not, in the words of my colleague from Nigeria again, an integrated curriculum.

Let me go back though to something Professor Gellhorn said earlier and point out that it is possible to introduce change. At the medical school which is situated right in the ghetto area of Newark, New Jersey, we have been able to squeeze four weeks out of the final-year medical school programme. We have zeroed in on a course that we call the Art and Practice of Medicine. One way in which we were able to sell this to other specialties within the medical faculty was by identifying specific gaps in the total teaching programme. Within this new course at the moment we concentrate on the area of medical ethics and on community medicine. We use small group teaching, we have a student/teacher ratio of greater than 1:1 - we are fortunate to be right in the middle of a metropolitan area. We run panel programmes that involve lawyers and priests, experts in ethics, and patient representatives. We try to teach the realities of medical practice, we engage in role-playing experiences - for example, getting students to pretend they are a hospital board seeking approval from a government agency to introduce some new sort of technology.

We enable - or perhaps I should say we force - the students to discover what it is to be a non-English-speaking patient in a community or hospital that is purely English-speaking. We force them to find out what it is like to be in that impersonal machine that a modern hospital really is and what it is like for a patient to be going to a general practitioner, what it is like, in short, to be out - as a patient or as a doctor dealing with patients - in every imaginable sort of circumstance that normally has not been touched on, at least in our curricula.
I could go on, but the point that I am trying to emphasize is that it is possible to develop these more meaningful integrated curricula, but this demands, as a previous speaker pointed out that specialists should suppress their own special interests and that the senior faculty should not play politics. Then, in line with what I think were Dr Browne's wishes, it will be possible to get well-trained, rounded physicians to be able to perform in the ghettos of big cities or in the affluent suburbs, in the developed or in the Third World, because the basic knowledge of practical medicine will be there and they can build on that whatever specialties they need.

Chairman: I would like to call on Professor F. Vilardell from the World Organization of Gastroenterology.

Professor Vilardell: I am going to speak as a physician, not as Secretary-General of the World Organization of Gastroenterology, because we have a research and an education committee dealing mainly with listings of training problems all over the world. As a teacher I must confess that I am training too many people very inadequately to meet the needs of society in my country. Nobody knows very well what these needs are. We are training enormous numbers of people without knowing what they are going to do later on. I have been listening to Dr Tejada-de-Rivero, and a few months ago I read Dr Mahler's famous paper that raised a great controversy, and I wonder whether the word physician really applies to the people we train. In Latin languages "medicus" means "physician" and "medical" means "of doctors", so medical school means a school for physicians, but is that really what is intended in the future? I attended the meeting of the European Society of Medical Education a month ago in Berne, and I was brought to a workshop where we discussed what primary health care meant, or what community medicine meant, and we agreed on very little, surprisingly. Everybody had his own ideas. We could not even agree whether primary health care is a sort of philosophy to be applied to all medical schools or whether it is a new specialty. There were some general practitioners there, and they fostered the idea that it was a new specialty.

Another thing I would like to say is that specialization obviously has deep roots, it involves maybe social advantages, maybe economic advantages too, and it is difficult to rearrange this. Another thing that is difficult is to find out what should be taught in medical school, and how much. I entirely agree with what Dr Baumann said earlier. We started a new medical school in Barcelona a few years ago with very few
Discussion

people. I started teaching physiology and gastroenterology, then general pathology, and then clinical medicine; two or three years later, even the brightest students had forgotten almost everything. Because many things had changed already, there was no disadvantage whatsoever in the fact that they had forgotten, because the whole thing was passé. But, in spite of that, how much should they know?

The way we are treating people at this moment, I rather suspect that a very good nurse could become an intern with a crash programme of very short duration. I certainly believe that we should try to decrease the number of medical students, because that is the only thing we can do at the moment and if our President proposes it, I would strongly endorse the proposal.

Chairman: Thank you, Professor Vilardell. You have brought out some of the prevailing uncertainties and confusion regarding the definition and characteristics of a primary care physician. Whether there is a need to decrease the number of medical students who will ultimately become the same sort of doctors as are now being produced by medical education or whether we need to change medical education so that the distribution of physicians among the specialties favours primary care physicians is the central issue of our discussion. In any event, the number of medical students in a particular school should be decreased so that the education provided is compatible with the physical and faculty resources of that school. Professor Fliedner has asked for the floor.

Professor Fliedner: Just a brief comment. Dr Belchior told us about the outcome of the CIOMS conference in his country; I thought the group might like to know that one of the outcomes of the Ulm Conference was that our local medical students approached me with the proposal to set up a student group to discuss the implications of the discussions at the Ulm Conference. First they calculated the period over which they would practice medicine, and this turned out to be the years 1986 to 2026; they then asked themselves what the health needs of society might be during those years. Then they wanted to find out where the gaps are in present-day training for practicing medicine during that time. I am fully in support of this project. We do not need to force them, they do it themselves.

Chairman: It would seem to me, Professor Fliedner, that if the medical school at the University of Ulm has that sort of crystal ball, we would all wish to invest in it and have some for our own schools as well.
Dr Lehmann: One could also ask what the needs are today. It has been said that 50% of all the patients who see physicians have psychosomatic problems. We are totally unprepared to meet those needs, as far as I can see, in general practice.
Resolution

At the conclusion of the Scientific Session, the following resolution was unanimously adopted:

Medical Education

The Xth General Assembly of the Council for International Organizations of Medical Sciences,

Having examined the Summary Statement of the CIOMS Round Table Conference on the "Health Needs of Society: A Challenge for Medical Education", and having considered the opinions and views expressed during this Session,

Recognizing that the role of medical education is of paramount importance for the development of the medical sciences and the improvement of health services,

1. Observes that a great deal of work has been done by national and international organizations to develop new systems of medical education to meet the needs of society;

2. Recognizes, however, that many thoughts and concepts have failed to become translated into practice because of obstacles of various kinds;

3. Urges the CIOMS Member Organizations to intensify or initiate programmes on the implementation of new concepts in medical education in general and in their own disciplines in particular;

4. Requests the Executive Committee to reactivate the CIOMS Committee on Medical Education and to elaborate in close collaboration with WHO, UNESCO, and the World Federation of Medical Education a programme of activities in this area.
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