

INTERRELATIONSHIPS
BETWEEN
HEALTH PROGRAMMES
AND SOCIO-ECONOMIC
DEVELOPMENT



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PREFACE

The technical discussions at the World Health Assembly are an annual event. They are not, however, a formal part of the proceedings. All participants in the Assembly—delegates, representatives of associate member states, observers, and representatives of other organizations—may take part and they attend informally, not as delegates of their governments or as officials of their organizations. The subject of the technical discussions is one of general medical interest, selected in advance. A background paper prepared on the basis of the comments of governments and intergovernmental and non-governmental organizations provides a starting-point for the discussions.

The subject selected for the technical discussions at the World Health Assembly in 1972 was The Contribution of Health Programmes to Socio-Economic Development. The present title was considered by the participants at the discussions as a more suitable one. There were 241 participants who, after the general chairman had delivered an address, divided up into eight discussion groups, each of which considered an aspect of the subject. A session of all the groups was then held and a joint report was prepared.

This volume contains the background paper, the chairman's address, and the report of the meeting as a whole, as well as an annotated bibliography. The subject is of such vital importance to countries, particularly to developing countries, that it is felt that all public health administrators will be interested in the views expressed during the technical discussions.



INTRODUCTION

It is now recognized that the distinction between economic development and social development is no longer tenable, even in terms of productivity and profit. Nevertheless, development has often been conceived of primarily in economic terms, since substantial economic changes are necessary for the achievement of many social goals.

Socio-economic development includes development in the health field. Every sector of the economy has a health component of such importance that it cannot be disregarded in any major socio-economic development. The health component and other components of the total system necessarily interact. Health not only affects the remainder of the socio-economic complex but is also affected by it, sometimes favourably, sometimes unfavourably.

Nevertheless, it is convenient to consider health programmes and other sectors of the economy as separate entities and to concentrate mainly on the contribution of health programmes to development, while neglecting the contribution of development programmes to health.

There are difficulties in this. The benefits accruing from health programmes are often difficult to identify and even more difficult to measure. It is rarely, if ever, possible to identify all the consequences of a health programme, especially the long-term consequences.

As health care is essentially a social service, health programmes are mostly established because they contribute to the satisfaction of primary human needs, irrespective of economic considerations except in so far as they can be afforded and constitute an asset for the future. For this and other reasons the cost and other data required to evaluate the contribution made by health programmes to development are rarely completely available, even when it would be feasible to obtain them.

Within these limitations, it is useful to distinguish certain categories of contribution, though they are admittedly somewhat arbitrary:

- (1) the contribution of programmes whose primary purpose is to maintain and improve the level of health;
- (2) the contribution of services whose primary purpose is to increase productivity;
- (3) the contribution of services that play a part in the control of health hazards and of environmental deterioration;
- (4) the contributions that play a supporting role or exert a beneficial influence over a wide field of human activities. With these contributions it often becomes meaningless to inquire whether it is the health services that contribute to the other socio-economic elements or *vice versa*.

As well as personal health care services and traditional public health services, health programmes include medical information systems, bio-medical research, and the education and training of health personnel. In addition to those of developing countries, the problems of highly industrialized affluent countries also claim attention.

A question of practical importance is whether the proportion of national resources devoted to health programmes is commensurate with their importance as actual or potential contributors to socio-economic development and, if not, how the deficiency might be corrected.

This question leads to a consideration of national and other planning organizations and procedures, of the manner in which priorities are decided within the total economy and within the health sector and, in particular, of the opportunities for stating the health case in the planning process and the kind of case likely to attract support for the health sector in development planning.

Finally, although most health proposals do not need analytical support or are such that they cannot receive such support, it is proper to give such quantitative information as is available when stating a case that is inevitably mainly qualitative. In this connexion, even when cost/benefit methods are feasible and relevant, their limitations in the health field should be recognized.

THE CONTRIBUTION OF HEALTH PROGRAMMES TO SOCIO-ECONOMIC DEVELOPMENT ¹

WHO Member States and intergovernmental and non-governmental organizations were invited to reply to the following questions:

(1) If you distinguish between economic and social development, what specifically is included under the term "social development"? What are the implications for action of this distinction? For example, is economic development seen as more fundamental and hence as deserving higher priority than social development? Or do broad social objectives provide effective directives for the execution of plans for economic development?

(2) How are the overall goals of the country's health programmes related to national development objectives as defined by the responsible authorities? Is closer integration of health programmes within the total development plan indicated and, if so, how is this being approached?

(3) For what purposes is it necessary to define the interrelationships between health programmes and socio-economic development, i.e., is this necessary as a basis for deciding allocations between the health sector and other sectors of the economy in order to ensure the inclusion of the health component in economic development projects, or for the more limited purpose of providing a general guide for health planners in programming and evaluation?

(4) What criteria and procedures are used by the national decision-making body in deciding the apportionment of resources between the health sector and other sectors of the country's economy? For example, is the criterion a proportion of the national budget or of the gross national product? How are priority decisions made within the health sector? Are cost/benefit ratios a significant factor in this process and, if so, how are these ratios assessed?

¹ This paper, based on the replies of governments and of intergovernmental and non-governmental organizations, sets out the background of the subject. It was available to participants in the technical discussions.

(5) Can you describe particular programmes in your country—such as those concerned with rural health, occupational health, or health problems of urbanization or migration—to which special attention has been given because of their particular relevance for socio-economic development?

(6) In addition to traditional health indicators, such as life expectancy and infant mortality rate, have other indicators such as nutritional status been used in your country for relating health status to socio-economic levels? Have differences been discerned between rural and urban populations? Has it been possible to establish a significant cause-and-effect relationship between changes in health status and socio-economic levels and, if so, has this relationship varied according to the level of development?

(7) How is the ministry of health represented on the national planning body? What is the mechanism for coordination between health planners and development planners? What has been your experience in stating proposals for health programmes in terms acceptable to development planners?

(8) In the strategy now adopted for development planning, including allocations to the health sector and for the determination of priorities within the health sector, how far is it the practice to rely on (a) economic arguments, (b) social arguments, and (c) demands for services? Has there been any significant change in the criteria and approaches by the national planning authority in recent years?

(9) Can you provide examples from your own country, based wherever possible on quantified studies, that might serve to justify increased allocations to health services in view of the short-term or long-term economic and/or social benefits that could accrue?

HEALTH PROGRAMMES IN RELATION TO DEVELOPMENT POLICIES

It was apparent from the replies of governments that the questions about the interrelations of health programmes and national development plans were of limited applicability in many countries. There are certainly some countries in which national development objectives are defined, a national planning body exists, and overall development plans embodying health development plans have been adopted. There are also countries which, though setting targets for the growth of the economy from time to time, have no defined and comprehensive national development objectives, no planning entity with a comprehensive mandate, and no formal overall development plan.

Nevertheless, broad national health objectives were referred to in almost all the replies. In planned economies these objectives are characteristically stated in national development plans—short-term, intermediate, or long-term. Here social development is regarded as a primary objective of the development plan, with economic development as a means to that end. This principle reduces the problem of health planning to one of balancing the health requirements of the population fully and effectively against the available public resources and the development of other sectors of the economy, or of providing the highest standard of health compatible with the economic development of the country without discrimination of any kind. In this view, it is taken for granted that socio-economic development implies appropriate health development and that health programmes are not in competition with socio-economic development but are an integral part of any rational development policy.

In countries where there is no explicitly defined set of national objectives there are often, none the less, agreed overall goals for national health programmes, in some instances embodied in legislation. For instance, a declared objective in such countries may be to encourage both social and economic development or to allocate as high a provision of resources for social development as is consistent with the economic development of the country. Since there is no formal overall development policy, each sector initially defines its policy objectives independently.

All the replies confirmed that the cost of such traditional public health services as sanitation, environmental health, and disease control programmes is everywhere met almost exclusively from the public purse. The main difference between the planned and the less planned economies is in the area of personal health care services. Under the former system a full range of personal health care is provided for the whole community as a matter of principle. In countries with a market economy, on the other hand, where varying proportions of health care are provided privately in response to demand, governments are often mainly concerned with providing for the less well-to-do or for the deprived sections of the community and with setting minimum welfare standards; in some of these countries, however, complete and comprehensive personal health care services are provided by legislation and other means.

Arrangements for the representation of health interests in overall planning and government policy-making differ in detail from country to country, but in general the secretary of state for health or social services is the person concerned with government decisions on the allocation of resources over the whole public expenditure programme, and he is usually represented on the national planning body when such

a body exists. The extent to which health is represented on planning bodies concerned with agriculture, industry, transport, public utilities, etc., is less clear.

There was little in the replies to suggest that the interrelations between health programmes and socio-economic development play a significant part in national budgetary procedures. There was also general confirmation that, with the exception of the economic effects of incapacitating disease, no general relationship between health status and socio-economic level has been demonstrated and that, with limited exceptions (e.g., occupational health), the goals of health programmes are not explicitly related to economic objectives.

There was near unanimity that the integration of health programmes with overall development plans is not as close as it should be, although not for the same reasons in all countries. In planned economies any failure to define explicitly the relations between the objectives of health programmes and development policies might be expected to arise mainly out of the difficulties inherent in the problem; indeed, in some of these countries, extensive studies and research are being undertaken to improve the data and the methodology. In countries without an overall development plan the technical difficulties are much the same, but in some there are also extraneous obstacles associated with the organizational and administrative structures of mixed or market economies.

A number of those replying remarked that, when the utilization of available resources in the health field is less than optimum, this is often partly because no explicit health development policy has been formulated within the framework of broader policies. Attention was drawn by one contributor to the growing gap between economic and social development in the implementation of short-term and intermediate-term plans; and another pointed out the risk of creating unforeseen and sometimes intractable new problems unless health care programmes are related to broad objectives.

There appears to be wide recognition that more complete integration of health programmes with overall development policies is a desirable objective, and that there are demonstrable advantages in having plans prepared jointly by health planners and development planners. Suggested measures to improve integration include: a more detailed analysis of resource use alternatives (including a more detailed specification of expected benefits); the development of more accurate measures in monetary terms of the direct economic impact of expenditure on health (while recognizing that such measures always underestimate the socio-economic impact of health programmes); the assessment of health requirements in relation to overall development planning at each level

of government; a switch, where necessary, from financial planning to resource planning; and the explicit definition of health and other social goals in long-term plans.

ALLOCATIONS BETWEEN THE HEALTH SECTOR AND OTHER SECTORS OF THE ECONOMY

As a basis for deciding budgetary allocations, various replies mentioned the principle of harmonious development, balancing the health requirements of the population against those of other sectors of the economy. It appears, nevertheless, that there is no formal process of decision-making in this area. To a considerable extent ceilings and apportionments of resources are decided at a high political level, on the basis of experience, and are related as far as possible to the total situation.

The fundamental criteria that determine the amount allocated to the health sectors were identified as: (a) established need; (b) community expectations; and (c) budgetary priorities. In a number of countries the proportion of the total budget allocated to health tends to remain at a fairly stable level, which means in practice that health allocations tend to increase as the economic level and government revenues rise.

The options at the national level in relation to the reallocation of resources, it was remarked, are usually marginal because of the relative inertia of existing programmes. Thus, a large fraction of the money spent on health services is necessarily absorbed in maintaining established services and providing for the necessary expansion to meet population increases, leaving only a smaller fraction for new programmes, improvements, and extended coverage. The criteria used as a basis for resource distribution in one country were: a *pro rata* distribution based on distributions in the previous year; allocations in accordance with long-term growth estimates; and allocations for new projects and expanded activities.

In another they were expenditure for operational needs and expenditure to implement projects included in the national development plan. Mention was also made of possible economic and social benefits as a ground for increased allocations, and of the short-term influence of the emergency situations that arise from time to time.

A predetermined proportion of the gross national product is little used as a criterion; in only two instances was mention made of the use of a stated percentage of the national budget as a guideline.

Cost/benefit ratios are not a factor of much significance, though in one instance cost/benefit analysis was said to be one of the deciding factors in changing the funding levels of existing programmes.

In general, it would seem from the replies that the demand for services, as expressed politically, is the main factor in deciding how much public money should be spent on health. The amount spent is subject to the constraints imposed by the health service structure, existing institutions, and feasibility considerations such as the level of professional manpower resources.

ALLOCATIONS WITHIN THE HEALTH SECTOR

Replies to the question on how priority decisions are made within the health sector showed that much the same considerations apply as in intersector allocations. Within the health sector also, decisions are made in accordance with complex processes that are not easily described and for which the guidelines are largely based on past experience. Public demand and the prevailing social concepts are obvious major influences, and the relations between health programmes and socio-economic development probably play a part also, although less explicitly. Proposed developments and operational needs are both taken into account in deciding allocations between programmes and services.

A few countries report that cost/benefit arguments linked with planning, programming, budgeting systems (PPBS) are used at the programme level for increasing the overall efficiency of services and, in some instances, as one of the bases for choosing between alternative feasible programmes for achieving the same objective.

In countries where a national development plan prescribes the main trends for development in the health sector as well as generally, the task of considering various aspects and branches of the health service is facilitated.

In countries where quantified parameters derived from the data provided by specially designed health surveys of populations are available, a greater degree of objectivity can be introduced into policy and priority decisions.

Among the factors cited as influencing decisions about priority are: the administrative feasibility and probable impact of the proposed action; the expectation that preventive programmes will increase the capacity of the labour force and lead to higher levels of production; the need to expand the education and training of medical and allied manpower because of the severe restrictions imposed on service development by

existing inadequacies; and the objective of integrating rural populations into the national life. It was also mentioned that many socially desirable programmes, such as health screening, have to be excluded on economic grounds so long as an unsatisfied need for basic health services and major disease control programmes exists.

The areas of high priority identified in the present inquiry correspond closely to those identified at the technical discussions on health planning in 1965. In order of frequency of mention they were:

- (1) Disease prevention and control, especially the control of communicable disease.
- (2) Personal health care services for rural populations, deprived sections of the community, and other special groups.
- (3) Maternal and child health services.
- (4) Education and training of medical and allied personnel.
- (5) Environmental health services (including the control of environmental pollution).

Nutrition, occupational health, rehabilitation, mental health, veterinary public health, the reorganization of services to improve their efficiency, and biomedical research were also cited by a smaller number of countries as priority areas.

It is noteworthy that, in the experience of many countries, the case for communicable disease control programmes requires little substantiation in order to satisfy the planning authorities. It was also remarked that in this area, where the benefits are eminently measurable, they are paradoxically regarded as self-evident.

QUANTIFICATION, INDICATORS, AND ANALYTICAL METHODS

The number of comments on the problems of quantification and analytical methods was considerable and included a number of closely reasoned analyses of cost/benefit methods, the gross national product as an indicator of national productivity, and the status of models in the socio-economic field.

While the broad lines proposed in the outline proved acceptable as a basis for discussion, there was one issue on which substantial reservations were expressed. A view advanced by a number of governments was that the treatment of the analytical approach in the outline understated the value of socio-economic models in the planning process and failed to draw attention to their potentialities. It was remarked, for instance, that the method of approach in the outline is open to the criticism of being made in the wrong direction. This particular reply

then went on to advance the argument that, instead of moving from the bottom upwards, an approach could be made with advantage from the top down; that the need is for a hierarchy of models starting at the highest level which, using relatively simple data, could be used to throw light on the allocation of priorities between sectors of government. They would not be used to put a value on objectives in different sectors because, as the outline pointed out, this would be impossible. In essence, the argument is that different levels of health planning have to be undertaken separately, and that models exist which can be used for some purposes at the highest administrative level. It was also suggested in this reply that the possibility of obtaining data it is considered not feasible to obtain at present—for instance, on human feelings and peace of mind—should not be dismissed.

While there appeared to be general agreement that cost/benefit analysis is of limited usefulness, it was pointed out in one or two replies that this should not prejudice attempts to define areas where it can be useful.

In a reference to national accounting systems, attention was drawn to the fact that they not only operate under the disadvantage that there is a substantial discrepancy between their requirements and the statistical information available, but also that their value is limited by the fact that they are designed for particular restricted purposes and not for systematic quantifications and evaluations of a sufficiently comprehensive character.

It was also pointed out that the use of the concept of the gross national product has been under heavy criticism for a long time. Two difficulties are particularly important in countries where services are included in social accounts: the evaluation of the contribution of services to the gross national product is made from their cost of production, so that an increase in productivity results in a diminution of their value; and services within the family, for example by the housewife, are not included. The gross national product cannot, therefore, be used as a complete indicator of national productivity.

Mention was made by a number of governments of the introduction of systems of programme analysis and review, an important feature of which is the scrutiny of objectives and outputs. Mention was also made of decisions to introduce planning, programming, budgeting systems to assist with resource allocation decisions within and between health programmes. The establishment of these systems is said to be leading to a consideration of the kinds of measures of output that should be used in the future.

On four points there was virtual unanimity: that analytical methods are not used extensively or not used at all in most countries at any stage of the planning process; that economic criteria are used increasingly

alongside social criteria in the health field; that economic arguments will be increasingly demanded in support of proposals for increased health and other social expenditure; and that analytical socio-economic studies should have high priority in health practice research programmes.

The quantification of relationships between health programmes and socio-economic development for planning purposes claimed a great deal of attention, and the obstacles that now exist to adequate quantification were referred to in many replies. They include:

(1) The inadequacy of health statistics in all countries and of demographic statistics in some countries. One or two developing countries mentioned that their statistics of births and deaths are so incomplete that even traditional health indicators cannot be established. In such circumstances, it is unrealistic to discuss the development of sophisticated indicators and analytical methods. The lack of adequate data was also identified as a serious impediment to quantitative studies of social change and of the consequences of social (including health) policies.

(2) A too exclusive reliance on input indicators. Indicators in current use in the health field relate mainly to inputs rather than outputs, e.g., the physician/population ratio, hospital beds per 1000 population, or the health manpower strength. Such input measures are commonly used as substitutes for output measures. The obstacles to the development of output measures include not only difficulties of definition and standards but also the conceptual difficulty that many quantifiable ends are intermediate.

(3) The lack of an adequate single measure of the development of the national welfare.

(4) The tendency of scientific disciplines to proceed in isolation from political science, economics, and sociology in studies that require a many-sided, comprehensive approach.

In relation to the question of the further studies needed to overcome these and other impediments to a comprehensive quantified approach in health planning, a number of priority areas for research were cited:

(1) The methodological problems inherent in multidisciplinary approaches to problems.

(2) The development of adequate instruments for analysis and mathematical models for use in the main health sectors at the national level.

(3) Quantitative estimations (including cost/benefit analysis where it is realistic) and the use of cross-section time-series approaches.

(4) The construction of a valid measure of national welfare development.¹

¹ The problem has been approached by attempting to construct a concept of total consumption of goods and services by the population, but even if this were achieved the distributive aspects of consumption would still not be covered.

(5) The construction and testing of social and health indicators; particularly, the development of indicators of "positive health" or well-being in addition to indicators of morbidity levels, service utilization, mental health, nutrition, socio-economic conditions, the quantity and quality of the health services provided, etc.

(6) The elucidation of social relationships and the development of social models to pave the way for the formulation of general theories of social change. In this connexion, it is suggested that economic theory relating to economic models and economic indicators and relations might serve as a conceptual framework for developing quantitative social assessments and indicators of social conditions, changes, and problems.

(7) The further development of professionally conducted mass periodic examinations as a basis for measuring the health status of populations.

EXAMPLES OF PROGRAMMES AND STUDIES

Governments were invited to give examples from their own countries, based whenever possible on quantified studies, that might be used as arguments for increasing health allocations on economic or socio-economic grounds. Not unexpectedly, many of the examples did not include references to quantified studies, although it would appear that they are usually based in greater or lesser degree on such studies.

Reference was often made to health surveys, nutrition and dietary surveys, and studies of working conditions and of the working environment that have served as bases for action in matters of social security, wages and labour conditions, and the welfare of immigrants and deprived sections of the population. Other replies reported that such surveys have been made but have been little used, even to arouse awareness of the social and economic problems of ill health, malnutrition, and adverse working conditions.

In some instances the health protection of workers has been an important factor in maintaining an efficient labour force in vital industries. Working days lost as a result of industrial injuries have been reduced by occupational health services in conjunction with other methods. Welfare services, such as the provision of meals at plants, help to promote productivity as well as health. Generally, occupational health services are reported to have improved industrial productivity.

Health control at seaports and international airports has become increasingly important with the development of faster means of transport and a quick turnover of passengers and cargoes. The part it plays in

the detection, prevention, and control of communicable diseases has commercial as well as health significance.

Health programmes involving the detection in the field of childhood diseases, nutritional deficiencies, leprosy, glaucoma, and alcoholism have, along with health education, assisted in the socio-economic development of isolated and backward populations.

There is evidence that in many countries the present high incidence of sexually transmitted diseases leads to a considerable loss of working hours and thus interferes considerably with a country's socio-economic potential. Health services, in the widest sense, are the main instruments for controlling these diseases.

The iodization of salt for goitre control, the fluoridation of water supplies, measures for the early detection of diabetes and other diseases, and sports medicine were cited as examples of health services that contribute to the improvement of health and wellbeing and hence to socio-economic development.

The contribution by rural health services to the safe use of agricultural pesticides has been important in relation to agricultural development.

The elimination of associated health hazards has contributed to the success of such development projects as irrigation schemes and artificial lakes.

Although dental health is not so obviously related to socio-economic development as the control of communicable diseases, sanitation, and so forth, there is no doubt that it contributes to, and forms part of, health in general. To this extent, dentistry, especially preventive dentistry, contributes to socio-economic development.

BASIC HEALTH SERVICES, WITH SPECIAL REFERENCE TO RURAL HEALTH SERVICES

The development of basic health services, especially in the rural areas, is fundamentally important in developing countries. It should have a high priority during the early stages of socio-economic development. In these circumstances, however, it is particularly difficult because of the shortage of qualified personnel and the tendency for them to practise in the towns and cities. Rural economic development cannot be accelerated, nor can the objective of assimilating the standards of rural populations to urban populations be achieved, without the development of adequate basic health services. In general, special programmes for the control of malaria, tuberculosis, and other communicable diseases cannot be instituted without a supporting infrastruc-

ture; and lasting effects can only be achieved if the basic health services are adequate. Basic health services for rural populations make an important contribution to the economic objective of developing the agricultural sector of the community in areas where ignorance, malnutrition, and hazardous environmental conditions are the rule. The lack of health care seriously impedes the socio-economic development of the nation. In this connexion it is recalled that in many countries rural populations constitute, and will for many years constitute, a high proportion—as much as 80-95%—of the national population.

DRUG DEPENDENCE AND ABUSE

The self-administration of dependence-producing drugs is now so widespread in many countries of the world as to constitute a major problem. The adverse physical, social, and economic consequences, both to the user and to society, are well known. The multidisciplinary and multi-organizational approach needed for prevention, treatment, rehabilitation, and control have an important health component and are the subject of intensive health efforts in a number of countries.

Alcohol should be included under this heading as a dependence-producing drug with enormous socio-economic implications.

FAMILY PLANNING

The fundamental importance of family planning in socio-economic development was stressed by a number of contributors, who pointed out that it affects not only the health of the mother and child but also the health and welfare of the family and community. An uncontrolled population growth may make it impossible for the community to provide adequate food, housing, schools, and health services and annul the benefits of socio-economic development.

Especially in countries with a low *per capita* income and a slow rate of capital formation, a rapid rate of population growth may constitute an obstacle to social and economic development. Health services have an essential contribution to make in this connexion.

(1) Though opinions differ on matters of technique and practice, it is generally accepted that advice on birth spacing, the avoidance of unwanted pregnancies, family size, and sterility is an essential part of a comprehensive maternal and child health service.

(2) Safe and effective family planning, whether provided through maternal and child health services or otherwise, necessarily depends greatly on biomedical research, medical surveillance, and the contribution of health services to changing attitudes and motives.

(3) A consideration of the contribution made by family planning programmes to socio-economic development should include both the benefits resulting from improved maternal and child health and the socio-economic consequences of smaller family size, a reduced rate of population growth, and a changed population structure.

(4) Any realistic consideration of the question should also take account of the time factor, i.e., delays in programme implementation and the period of years that elapses before the full demographic impact is felt. Account must also be taken of the cost of transferring resources from other programmes to family planning programmes when personnel is limited.

HEALTH EDUCATION

It is appropriate to recall the increasing importance of the attitudes and behaviour of the individual in health promotion and disease prevention and consequently the significance of health attitudes and behavioural patterns as factors in socio-economic development. In this context, the importance of health education is self-evident. It is also worth emphasizing that changes in mass attitudes brought about by health workers can and should assist materially in bringing about socio-economic changes. Health campaigns that include the right kind of health education are a powerful means of convincing people that the future can be different from the past, a step of importance in disease-ridden countries, where a fatalistic attitude is the rule. Until such attitudes are changed, no population can make the effort needed for development. Thus the health campaign, especially in its educational aspects, can be a weighty element in the early stages of a coherent development policy.

FOOD HYGIENE AND FOOD STANDARDS

The importance of public health, especially of the hygiene of food and water, for the development of tourist industries requires little emphasis. In the replies this subject was enlarged on to the effect that the rapidly expanding tourist traffic and other population move-

ments, such as those associated with migrant labour, create potential health hazards, such as food-borne diseases, not only for travellers but also for the populations of the countries to which they return.

The point was made that national and international provisions for controlling food-borne infections and intoxications, though primarily public health measures, are virtually indispensable in the socio-economics of the modern world. The large international trade in human foodstuffs and animal feeds requires extensive controls and standards for commercial as well as public health reasons. The progressive centralization of, and new technologies in, food production, processing, and distribution and the growth of canteen and similar methods of preparing and serving meals for large numbers of consumers are associated with a variety of preventive measures taken on both health and trade grounds. The motivating forces behind the development of international food standards can be identified as the concern to protect the consumer and the need to facilitate international trade in foods.

Food-borne diseases, which are reported to be on the increase, can be a substantial obstacle to the economic development of the countries involved. Control measures include an infrastructure of food hygiene practices and health education at the sources of production and during manufacture, processing, storage, transportation, and distribution.

In many communities, recent advances in science and hygiene have diminished some of the previous risks of food adulteration and contamination. However, these changes have often been accompanied by new hazards resulting from environmental contamination with agricultural chemicals (pesticides and antibiotics), industrial chemicals (salts of heavy metals), and even radionuclides.

The maintenance of a high level of reporting and diagnostic practices and close collaboration between veterinary and public health services are among the measures regarded as essential for providing the basis for international standards of food control, such as those promulgated by the FAO/WHO Codex Alimentarius Commission. Any plans for a food hygiene programme have also to be kept flexible to take prompt and full account of technological, ecological, and population changes (migration, tourism, urbanization, etc.).

NON-COMMUNICABLE DISEASES IN DEVELOPED COUNTRIES

The economic losses caused by cancer and cardiovascular disease in the developed countries are enormous. It is estimated, for instance, that the cost of treatment and the loss of production due to cancer of the lung is upwards of \$ 10 per annum per person in many countries.

The magnitude of this problem has been demonstrated by clinical, statistical, and biomedical investigations. Public awareness of the health risk of excessive cigarette smoking is also due largely to health studies and publicity based on them. In the present state of knowledge the prevention of lung cancer is largely a matter of health education. The cost of health education and of further research is small compared with the improvement of the national economy that would result if cigarette consumption was substantially reduced.

At present, coronary disease, in common with many other cardiovascular diseases, is not preventable. It is, however, believed by many experts that biomedical research will point the way to reducing its incidence at a cost that would be small compared with the benefit accruing in purely economic terms.

Clinical, laboratory, and statistical research in the health field has made notable contributions to socio-economic development and will doubtless continue to do so. Almost every technological and social development in the past has created new health problems requiring new health policies and measures of control to safeguard not only health but also the effectiveness of the development itself; and there is every reason for believing that this will continue to be so in the future.

PHYSICAL AND MENTAL HANDICAP AND REHABILITATION

In developed countries the problems of disability are increasing as a result of greater industrialization, road accidents, and improved life-saving medical techniques. The problem is also increasing in developing countries, where as many as 10% of all children suffer from severe malnutrition, educational levels are minimal, and disabling diseases remain uncontrolled. The overall incidence of disability is probably about the same in developing as in developed countries.

In estimating the effect of disability on the national economy, developed nations have traditionally relied upon measures such as the cost of treatment per patient, the cost of long-term maintenance and public welfare payments, the loss of projected income and tax revenue, and the effect of withdrawing incapacitated workers from the labour force. It has been shown, for example, that in the USA every case of severe mental retardation prevented saves the country almost three-quarters of a million dollars, and every dollar spent on rehabilitation returns between \$ 17 and \$ 35 to the economy. In Europe, it has been estimated that disability may reduce the economically active proportion of the population from roughly 35% to 28%. In the USSR it has been

calculated that 66 roubles were saved for every rouble spent during an 11-year national poliomyelitis vaccination campaign.

The technical feasibility of restoring physically disabled persons to a useful and active life is now accepted. Often a physical handicap that is not in itself significant may become totally incapacitating if associated with poor education and unemployment. However, the advantages of rehabilitation weigh less with governments in developing countries, where a substantial proportion of the labour force is either underemployed or unemployed.

From the information available it is clear that the payment of disability pensions is not a satisfactory answer to the problem of occupational incapacity and that the whole field of rehabilitation should be regarded as an essential socio-medical activity.

RADIATION MEDICINE AND THE CONTROL OF ENVIRONMENTAL POLLUTION

The meticulous control of the applications of nuclear technology, to which radiation medicine has made an essential contribution, has virtually averted the hazards of ionizing radiations ever since nuclear power was developed as a controlled source of energy and radioactive isotopes came into wide use. It affords, perhaps, the best example of the development of a vast new technology without environmental contamination or injury to health either to those at occupational risk or to members of the general public. The development of nuclear power also contributes towards a cleaner environment inasmuch as it replaces conventional thermal sources of energy, which still, though to a diminishing extent, are serious sources of pollution.

It is appropriate to add that the environmental pollution which, without adequate controls, will follow upon rapid industrialization is likely to have grave consequences in many developing countries because of the relatively fragile ecological equilibrium that commonly exists in them.

THE PROBLEM OF INTEGRATING HEALTH PLANNING WITH SOCIO-ECONOMIC PLANNING

DR ESTHER AMMUNDSEN¹

As the subject for these technical discussions, which are taking place in the twenty-fifth year of the life of the World Health Organization, the Executive Board has selected *The Contribution of Health Programmes to Socio-Economic Development*. I cannot help wondering what the founders of the Organization would think of this choice and how they would react if they could hear the forthcoming discussions; for it will be shown without any doubt that their successors—the health administrators of developed and developing countries alike—are chiefly concerned not with technical or research or even purely medical matters but with fitting health programmes into the general pattern of community services and with the growing difficulty of establishing priorities within the health services themselves, taking into account the money, the facilities, and the personnel that can be made available.

The last decade especially has made it clear that careful planning of the use of both natural and human resources is indispensable. Such planning is not made any easier by the growing demand of the population for a better health service, by the advances in medical science that have made nearly everything theoretically possible or, I feel compelled to add, by the failure of a majority of the medical profession to appreciate the difficulties of planning.

The choice of this subject shows WHO's flexibility and modernity of outlook, for it reflects the realization that health services can only be looked upon as a part of society and must follow—and if possible influence—the development of that society, learning to use principles and methods that are commonly used in other fields to describe and govern development.

I shall not try to describe the excellent background paper that has been prepared for these discussions. The paper speaks for itself and

¹ Director-General, National Health Service, Copenhagen, Denmark. Dr Ammundsen was General Chairman of the technical discussions.

is of considerable interest not only to the members of health administrations present here but also to economists, ministers of finance and budgeting, and community planners.

In part the paper is based on the response of a number of countries to an "outline document" circulated by WHO. The overall impression is that there is an enormous need to develop methods and principles for the long-term planning of health services that will permit comparison with planning in other areas and can be understood by economists. This is necessary to attain the objective that must underlie all health planning: to ensure that the health services make an optimum contribution to the development of society.

It must be borne in mind that, despite the enormous differences in levels of development, certain characteristics and aspirations are common to practically all countries. Although they are following different paths at different paces, all countries subscribe to the same goal of providing health care for their populations within the limits of feasibility and resources. They are no longer content with piecemeal development. They have been increasingly compelled to interrelate a multitude of innovations and to look beyond the present. Premeditated development on a national scale, in some instances on an international scale, has replaced the haphazard development of former times. Governments have been compelled to plan, first in the economic field and somewhat later in most cases in the wider field of social services.

Moreover, they can no longer disregard the human, environmental, and ecological consequences of the application of new technologies, the introduction of new industrial processes, and a new social and organizational alignment. Nor can they ignore the major problems of our time—the rate of population growth, rapid industrialization and urbanization, social instability, environmental pollution, and the growing disparity of material living standards between nations.

The problems of environmental pollution appear in some respects to press harder on the highly industrialized countries than on those at earlier stages of industrialization. However, the background paper makes the point that potential dangers are no smaller, and are in some respects greater, in the developing countries than in the most highly developed.

These are among the considerations that determined the progressive obsolescence of exclusive economic planning and its replacement by socio-economic planning, that is, planning for social goals, with economic development as a means rather than an end.

For health administrators it is natural and gratifying that experts in economics and politics seem to be becoming more and more dissatisfied with national *per capita* productivity or gross national product as

useful measures of development in a community. We in the health field have known for a long time that a purely economic factor cannot be used as a measure of variations in the living standard or the well-being of a population—on the contrary, steps to improve conditions of life may well limit productivity, as in the fight against pollution, and it is well known that much expenditure on the health or social services does not result in improved productivity. For example, a growing number of the working population are engaged in the care of the aged and infirm, and no longer participate in economically productive activities.

It is well known that the proportion of the gross national product spent on health programmes in all countries is more or less stable, often about 5%. However, an increasing problem in many countries—both developed and developing—is that even if the money is available there seems to be no possibility of recruiting or educating the manpower required to keep pace with the future development of the health services. Total planning of our health programmes and of all aspects of their relation to the community is becoming an absolute necessity. However, with the present methods of planning and perhaps especially of evaluation of results in the health field, this is a task for which we are ill equipped. The background paper goes relatively deeply into this problem, and also describes the difficulties in using cost/benefit analysis and similar techniques.

One of the major questions you will probably wish to discuss is how far analytical methods are feasible, realistic, justifiable, or even desirable in health planning and management in different circumstances. There may well be differences of opinion on this, but there appears to be general agreement on three points. First, analytical methods cannot provide the whole answer to questions of priority and efficiency; they do nothing, for instance, to overcome the obstacles attributable to organizational policies, professional resistance, and drug misuse. Secondly, the sophisticated methods used to good effect in some highly developed countries are at present inappropriate and unrealistic in many developing countries. Thirdly, the far-reaching impact of health programmes on every aspect of social and economic life is unquestioned, although it cannot be specifically identified or measured.

Other difficulties result from the different systems used in various countries.

In all countries, as far as I know, the services traditionally called public health services really are public. They are directed towards the whole population or groups thereof and are financed by public funds.

The same is not true of personal or individual health care, concerned with the treatment of diseases. The systems vary from free services

wholly financed from public funds, via many variations and combinations of free and privately paid services, to systems where public money for personal health care is available only for those who have no money themselves. It is quite obvious that these last-mentioned systems present extra complications for comprehensive health planning, but the general impression is that the trend is towards more support from the public purse for personal health care, thus facilitating planning in this field.

It would be superfluous to describe in detail the conflict that faces all health authorities. They are torn between the wish to allocate money and personnel to the popular tasks that produce spectacular results, such as some complicated hospital procedures, and the duty to take care of preventive work that is less spectacular but may save many more lives. WHO, by constantly emphasizing this conflict and by providing advice and warnings to Member States, has undoubtedly had considerable influence on the health policy of the world.

However, the problem is not yet completely solved. Indeed, I feel tempted to say that what was once a problem for developing countries with a severe shortage of personnel and money is today a problem for the highly developed industrialized countries as well. The populations of the latter countries are used to the highest standards of treatment and care, and may have been indoctrinated by the medical profession with the belief that they are individually entitled to this; however, such care can be bought on a large scale only at a cost in manpower and money that the community cannot afford without depriving other fields, chiefly industry; so a vicious circle is about to be formed.

In this situation the regrettable fact is that we still lack the methods to describe in the usually recognized terms of planning how different measures will influence the socio-economic development of a given country or community.

In a way it seems incomprehensible that the medical profession, which for centuries has been trained to evaluate the clinical results of a given treatment for a specific disease, has made so little attempt to evaluate the results of its work for the community as a whole, and that concepts like operational research and operational analysis, which have been used with variable results in nearly all fields of community life, are practically unknown as methods of evaluating the total value of health programmes.

Admittedly some research has been carried out in this area in recent years, but the amount of personnel and money invested in it has been astonishingly small compared with the enormous sums devoted by all Member States to health programmes. One result of this has been a certain distrust among economists of the will and ability of doctors to participate in a critical way in the future planning of health services.

The explanation must be that there was formerly no special need to develop evaluation methods because (1) health expenditure was more or less accepted by the budgetary planners, presumably as unavoidable, and (2) the finance was provided from many different sources: by state or local authorities through tax income, by insurance schemes, by private individuals, etc., thus obscuring the overall picture of rapidly rising costs. Today, however, the truth has come to light: taken together, these expenses double during very few years unless they are somehow stopped.

The result of this lack of foresight was that any money available was rapidly invested directly in new programmes—always a popular thing—instead of in a slow and perhaps depressing evaluation of what might or might not be achieved by building a new hospital, or introducing a new and costly therapeutic procedure, or perhaps launching a mass examination or a mass campaign of some sort.

Consequently, I believe it is no exaggeration to state that one of the gravest deficiencies of present-day health administrations is the lack of a sufficient number of qualified persons who can work out methods of analysing and evaluating health programmes—methods that combine the knowledge of the medical profession with that of economists and community planners, for neither group can do the task alone.

The group discussions in which you are about to take part are highly complex and will no doubt range from the mathematical to the historical, from the philosophical to the mundane. Guided by your varied background and experience and by the paper in which your several and collective views have been assembled, the attention given to different aspects of this enormous subject will doubtless vary greatly from group to group. You may, nevertheless, consider it appropriate to make recommendations on future research requirements.

REPORT OF THE TECHNICAL DISCUSSIONS

THE SCOPE AND CHARACTER OF THE PROBLEM

There was complete agreement among the participants that health needs and health programmes cannot be considered in isolation and that health programmes necessarily form a part of an interacting pattern of national programmes. On this account, although it was felt by some that the advertised title had certain advantages, there was general agreement that a more appropriate title for the discussions would be *The Interrelationships between Health Programmes and Socio-Economic Development*.

Because of this interrelationship, economic development cannot be isolated from the social context. If the interrelationship is not taken into account, material advances may be accompanied by loss of social cohesion, insecurity, delinquency, mental stress, and other social ills. In fact, the trend is now for economic planning to give way to socio-economic planning that involves planning for social goals, with economic development as a means rather than an end.

Socio-economic development consists of various elements related to the productive and service spheres of activity. Health programmes cannot be related unilaterally to either the economic or the social spheres, as they influence both and are influenced by both. The interrelationship between socio-economic development and health is seen in the health consequences of socio-economic development, such as environmental health hazards and the health problems arising out of urbanization, industrialization, pollution, and the opening up of new territory.

The major areas in which health has a contribution to make to socio-economic development include problems arising out of the rate of population growth, rapid industrialization and urbanization, mental stress and social instability, environmental pollution, and the growing disparity of material living standards within and between nations.

It is recognized as a basic principle that health programmes are rarely justified solely on economic grounds, but rather as a means of maintaining and improving health, which is perhaps the most important single factor in improving the quality of human life. As an example, the provision of health care for the aged does not yield obvious or immediate economic returns. Nevertheless, programmes for the aged that are justified on the basis of improving the quality of human life will yield considerable economic and social benefits in the long term, although in some countries such programmes understandably attract a relatively low priority at present. It is accepted without question that health is an objective in its own right and represents one of the most important manifestations of social progress.

In considering the benefits that accrue from health programmes, account should be taken of the fact that usually many sectors of the economy are involved in improving and maintaining health or, in other words, that the contribution is only rarely made exclusively by health programmes. Agricultural development, for example, is often a vital factor in improving nutrition, and housing, water supply, and sewage disposal have close interrelations with health although they do not necessarily appear in a health budget.

It is especially important that the authorities in countries in the early stages of industrial development, where a shortage of resources and other significant constraints often exist, should understand that, although an increased production of material goods is the basis of improving living standards, these standards cannot be raised without a concurrent amelioration of conditions of work and life.

There was general agreement among the participants that their discussions should cover the planning process, the ensuing operational activities, and their results. Questions that needed emphasis in the discussions were the role of medical research in socio-economic development, health planning methodology, and the further development of standards, indicators, and analytical methods.

HEALTH PLANNING AND HEALTH PROGRAMMES IN RELATION TO DEVELOPMENT POLICY

Some form of national planning is generally accepted as government policy, whatever the social and economic system of a country, and in all countries the approaches to health planning and evaluation have a great deal in common. There are, however, great variations in application, according to the country's socio-economic system and level of economic and industrial development.

In socialist countries, health planning and social planning are already an established and fundamental part of national planning and of the policies on which it is based. In most countries arrangements exist for planning bodies or agencies and thus for the integration of sectoral plans into an overall plan embracing economic, social, educational, health, and cultural aspects. The organization for planning is usually multitiered, commonly with a cabinet or presidential level, a ministerial level for sectors within the control of individual ministers, and a variety of regional, state, provincial, and local levels. The planning process requires the participation and cooperative action of sectoral administrators, and is a multidisciplinary process in which development planners, economists, financial officers, health administrators, and other specialists take part.

Since the ultimate aim of any development plan is to raise the level of living of the population, health promotion and protection are a necessary element of the total plan. The health sector must keep abreast of contemporary refinements of economic planning not only for the purpose of supporting its claim for resources but also because this will permit health administrators to make allocations within the health sector more effectively. It is also necessary that the health sector be involved not only during the development of the plan but also during its execution and evaluation.

To ensure the integration of health programmes into general development plans, the health sector should be fully represented in the planning process from the outset. There should, moreover, be a close liaison between the ministries and other bodies concerned, in order to ensure that the health aspects of the development plan are adequately provided for.

As a rule, priority decisions are unavoidably complex. In the preparation of a health plan, for instance, a study and definition of health problems, an explicit statement of objectives and goals, the design of the operational programme, and its implementation and evaluation are all factors that should be taken into consideration. In deciding on priorities within the plan, the magnitude of the problem, feasibility questions, cost effectiveness, probable benefits, and urgency are among the factors to be taken into account. The background of the decision-makers and the difficulties involved in a multidisciplinary approach to planning are among the admitted constraints that have to be faced.

In the experience of some participants, criteria normally used for budgetary allocations are not particularly appropriate for allocations as between the health sector and other sectors of the economy. Budgetary allocations in the health field are unavoidably influenced in greater

or lesser degree by overall development policies. In some countries it appears that allocations for health are relatively low in the list of priorities. Moreover, within the health sector itself, the priority given to disease prevention tends in many countries to be too low. In fact, the demand for curative care is sometimes so great as to compromise the funding of preventive health programmes. Reasons for this seem to be the attitude of some health and national planners as well as the relationship between health planners and administrators and economists and others involved in the planning process. In some instances health administrators and economists fail to consult sufficiently with each other. The health sector sometimes tends to hold itself somewhat aloof, health officers failing to realize that resources for health are limited and that the needs and problems of other sectors must be recognized. Although it is true that the inadequate representation of health in socio-economic planning sometimes stems from the economists' lack of understanding of the importance of health, it is also sometimes attributable to a reluctance on the part of health workers to concern themselves with economic problems.

Economists and political leaders like to have hard facts and figures to justify health expenditure. Health planners should provide them as far as possible and should indicate clearly when they are unable to do so.

Because health programmes should not be justified solely from the economic viewpoint, it is necessary to convince the planners and economists of the role of health in socio-economic development, particularly in view of other priorities that have a place in planning for the socio-economic development of a country. Hence there is a need to develop principles and methods for health planning in a way that corresponds to planning in other fields and is understood by planners and economists. The aim should be to ensure that health services make an optimum contribution to socio-economic development. This is also necessary so that health programmes can achieve optimum efficiency consistent with the concept of health as defined by WHO. Only when the various socio-economic impacts of health programmes are generally recognized will the programmes be organized in the most efficient way.

QUANTIFICATION, INDICATORS, AND ANALYTICAL METHODS

Although some health programmes require no economic justification, there is a need to quantify the benefits of health programmes so as to enable a fair appropriation of financial resources to be obtained for them. However, basic health and socio-economic data and indices are not available for various reasons, such as lack of properly trained personnel,

of equipment, and sometimes even of understanding of the value of these indices.

The participants noted the existence of non-measurable effects of health services, particularly such subjective elements as improvements in the quality of life and contributions that develop as relatively long-term chain reactions.

The difficulty of quantifying social indices of change was also noted, and it was concluded that there is room for further research in developing socio-economic theory and indicators to measure change. Probably no single measure would suffice. It would be very useful if common measures of social change could be developed. In this respect, experience has shown that, when health programmes constitute an integral part of general socio-economic development plans, they can be assessed from the point of view of their influence on all fields of national economy and culture.

Basic data or statistics

Basic data or statistics found to be lacking or inadequate include:

- (1) *demographic information* (differential mortality and fertility rates, the long-term demographic pattern of the country);
- (2) *health statistics* (morbidity rates, including data on absenteeism, invalidity rates, occupational diseases, health care statistics);
- (3) *health knowledge*, e.g., knowledge of the interactions of different diseases or of the true consequences of a given disease;
- (4) *data on environmental health* (water supply, sewage system, pollution, etc.).

It was remarked that the situation is more favourable in countries where state-organized health systems provide services for the whole population, as recommended by the World Health Organization.¹

Economic indicators

The economic indicators used at present have certain inadequacies:

- (1) Gross national product (GNP). The GNP is inadequate as an indicator of national productivity for the following reasons:
 - (a) It does not take account of the productivity of services. The service produced by a hospital is counted in the cost of functioning; improving the hospital's productivity tends to diminish its contribution to the GNP.
 - (b) It does not take account of a great number of health realities, e.g., the impact on health of the accelerating pace of work in indus-

¹ Resolution WHA23.61 (*Off. Rec. Wld Hlth Org.*, 1970, No. 184, p. 34).

try or fatigue due to long journeys to and from work. On the contrary, the expense of private or public transport results in an increased GNP.

(c) It confuses what is produced by a country and what is used for the improvement of the quality of life.

(2) Total consumption of goods and services. This is also not entirely satisfactory as an indicator, as there are goods and services that may not be marketed. Examples of these are education and certain aspects of health care. Moreover, a growth in the consumption of medical care is not necessarily an indicator of better health. The economic effect of health programmes is not the growth of health expenditure but the improvement of the health situation.

On the question of the inadequacy of economic indicators, the following difficulties in making an economic evaluation of health programmes can be mentioned:

(1) Lack of knowledge about the economic consequence of health insufficiencies; for example, the impact of poor nutrition on working capacity, the impact of endemic diseases (malaria, schistosomiasis) on productivity.

(2) Lack of quantified knowledge of the interaction of health and economics; for example, the low productivity due to an endemic disease may constitute an obstacle to economic investment.

(3) The existence of long time-lags between a health action and its economic impact.

(4) The absence at present of comprehensive models of accounting prices, which the economist would like to have.

Use of analytical methods

Modern analytical methods have been used in some countries to provide bases for decisions on alternative approaches to health problems or to justify expenditures. They could be used in other countries provided that the necessary information and trained manpower are available, but it would be unwise to apply the methods used in developed countries to developing countries without considering the data and manpower available. Moreover, quantification and evaluation in health economics require further refinement and development.

Methods to rationalize health expenditure. Among the methods proposed are:

(1) *The cost-effectiveness method* (rationalization of budgetary choices or the planning programming budgeting system).

This makes it possible to establish the most effective and economic means for achieving a given result, either at minimum cost or with the best use of the available medical and monetary resources. The method

permits the discovery of linkages between different objectives and hence the improvement of the efficiency of the expenditures. It is recognized that its utilization is highly complex and presupposes considerable resources in qualified staff and very thorough and costly preparation. While the method cannot perhaps be used generally at present, even relatively simple applications are often well worth while.

(2) *The establishment of norms.* As a first step it can be useful to analyse in depth the available resources (different kinds of medical and paramedical personnel, equipment, etc.) and the possible activities that can be undertaken with those resources. This is the best way to achieve their optimum use, even if a reconsideration of objectives is not possible.

It is now explicitly recognized that certain classical indicators (cost per hospital day, doctor/population ratio, bed/population ratio, etc.) are no longer valid as economic indicators; on the contrary, they often represent contra-economic criteria.

None of the above methods can replace decision-making in choosing between alternative objectives, either in the health field or, *a fortiori*, in wider fields.

Methods of comparing health and other programmes from the point of view of their relation to economic efficiency. Some participants noted that the definition of the volume of resources available for health programmes cannot be derived from a mechanistic model. It was observed that the general allocation of resources as between different sectors is necessarily a political decision. Nevertheless, it was felt useful to examine a number of model types that are often proposed to assist this process.

(1) *Cost/benefit analysis.* The applicability of cost/benefit methods was questioned on the ground that they presuppose:

(a) That all costs and all benefits can be measured at the real price. This is impossible because of the nature of international prices, the influence of monopolies, etc.

(b) That all the costs and benefits incurred or obtained at different times can be made comparable at one and the same point of time by means of a discounting rate that allows for future depreciation.

Economists are not able to agree on any such rate. Health administrators should also be aware that theoretical economists contest seriously the applicability of this method in the general economic field.

(2) *Socio-economic models and stimulation models* are useful tools for elucidating socio-economic mechanisms and are interesting analytical exercises. Nevertheless, the lack of precise information limits the value of this approach.

(3) *Systems analysis* puts health in its socio-economic context but does not presume to rely on a single consolidated index to represent a multiplicity of interactions. Examples will be found in the following section.

CONTRIBUTIONS OF VARIOUS HEALTH PROGRAMMES TO SOCIO-ECONOMIC DEVELOPMENT

It was not possible during the discussions to examine in detail all the kinds of contributions that various health programmes might make to socio-economic development. It was recognized that every rationally planned and properly implemented health programme does in fact contribute to socio-economic development. Examples of such contributions are given below. The question of what is sometimes called "the negative economic impact" of health programmes was also examined.

Examples of contributions

Personal health care programmes. Illness is a major burden for the individual and his family, reflected in a reduction in productive capacity. Consequently there is a need to devote substantial resources to treating disease early and restoring people to full productivity speedily. Early diagnosis also reduces the fatality rate.

Programmes for the control of communicable disease. It was generally agreed that specific preventive measures (eradication, immunization, etc.) undoubtedly reduce mortality and morbidity substantially, though some participants referred to the difficulties of measuring this contribution. Others discussed the use of systems analysis methods for the purpose of demonstrating various kinds of economic impact made by such programmes. One of the working groups, taking malaria as an example, referred to the following results obtained from antimalaria campaigns:

- (1) improvement in production through increased working time in agriculture and in industry, and improvement in the productivity of workers;
- (2) impact on the material factors of production, particularly the reclamation of arable land after malaria eradication;
- (3) effects on school attendance;
- (4) increase in socio-cultural inducements to economic progress;
- (5) increase in confidence among the population in a better future;
- (6) better tourist facilities; and
- (7) improvement in the efficiency of the health system itself and an increased willingness among the population to use the services provided.

Programmes for the control of non-communicable diseases (including malnutrition). Numerous examples were cited of programmes related to malnutrition, cardiovascular diseases, nervous and mental disorders, etc. It was accepted that every policy of prevention was able to reduce mortality, to save cost in hospital bed utilization, and to reduce absenteeism in industry. Particular attention was drawn to the importance of nutrition programmes as a means, *inter alia*, of increasing productivity and reducing the impact of various other diseases, e.g., intestinal infections and infestations.

Family planning. A variety of opinions were expressed by participants, but on some issues a consensus was reached:

(1) Even if a given rate of population growth is neither a factor in nor a manifestation of development, a reduction of the rate is not *per se* sufficient to contribute to development unless accompanied by measures to improve material production.

(2) If a programme of family planning adapted to the local situation is to constitute an aid to economic development (by reduced education expenditure, reduced unemployment, etc.) and to bring about an improvement in the health of mothers and children, the following points must be taken into consideration:

(a) The cost of family planning to the community is not exclusively a monetary cost (e.g., the sociological impact, the mobilization of propagandists, and the burden on health services are also involved).

(b) There is a considerable time lag between the initiation of a campaign and the first demographic results and again between the results and the economic consequences.

(c) Many programmes require to be re-examined to improve their effectiveness.

Occupational health services. Poor working conditions, high working intensity, and long hours have serious repercussions on family and community health. The socio-economic impact of measures taken by occupational health services is evident, and has been amply demonstrated. The beneficial efforts of occupational health services include:

(1) reduced absenteeism and improved productivity, which result in increased profits and wages;

(2) saving of lost working time and improvement of production capacity;

(3) reduction of personnel turnover and better organization of the work within the individual plant;

(4) saving of hospital expenses and of compensation payments;

(5) saving on occupational re-education;

(6) reduction of sickness, disability, and mortality.

Environmental health services. Badly planned urbanization and industrialization entail a serious deterioration in health conditions for people moving from the country to the town. This results in absenteeism, high personnel turnover, and lower productivity, and is an obstacle to new investment in economic activities. In the health field it results in higher health expenses without any improvement in the level of health of the community. Pollution due to such urbanization and industrialization contributes to the degradation of natural resources: water, air, and soil. Sooner or later, if adequate prevention measures are not taken in good time, the need to protect the population will make it necessary to institute a very costly environmental health programme. Agricultural pollution calls for close coordination with the health service in order to ensure high agricultural productivity without health hazards to people and livestock.

Health education programmes. Health education is a prerequisite for obtaining the people's participation in various health programmes, especially those of a preventive character. Health education programmes are particularly valuable in making people aware of the relationship between better health and socio-economic development.

The "negative economic impact" of health programmes

This critical question was raised frequently. It is beyond doubt that accident prevention in industry, vaccination programmes, better nutrition through irrigation schemes, etc., have positive effects on economic development. But it is often argued that some health programmes have "negative" effects on economic development, e.g., that pollution control inhibits industry, that care of the aged extends the life of economically dependent people, that health programmes absorb highly qualified manpower, and that a reduction in morbidity increases unemployment.

The discussion demonstrated that such arguments represent only one facet of the problem and that priority choices are unavoidable when resources are limited. It is not pollution control that is uneconomic but uncontrolled pollution resulting in, for example, the Los Angeles smog. Pollution entails a high cost for the community, and that cost has to be met sooner or later. For the sake of better health and its socio-economic implications, it is better and cheaper to meet the challenge early.

GENERAL CONCLUSIONS

A number of general conclusions were reached in the group discussions and in the general discussions that followed the presentation of

the group reports. They are referred to directly or indirectly in other parts of this report, but it is convenient to bring them together here.

Health and health services are interrelated and interreact with all social development. To speak of health as contributing to socio-economic development is artificially restrictive. It is also clear that many sectors of the economy other than the health sector make an essential contribution to the maintenance and improvement of health. Agricultural development and, more remotely, irrigation projects, for example, are often one of the bases of programmes for improving nutrition.

As all sectors of the economy are subject to the common constraints imposed by financial, manpower, and technological resources, two-way communication and participation by health departments and other major departments and ministries engaged in central planning is essential. Only in exceptional cases should health action be carried out in isolation.

In a number of health areas, favourable cost/benefit ratios have been amply demonstrated and documented. Primary prevention and surveillance activities, such as smallpox and malaria eradication, immunization, nutrition programmes, and sanitation projects are the most obvious examples in this category. Even in these areas, however, efforts to achieve the objective with maximum effectiveness cannot be dissociated from wider economic considerations.

Curative services and particularly comprehensive health care services are very costly and usually absorb a large fraction of the total cost of health services. They vary greatly in effectiveness and efficiency, and cost/effectiveness and cost/efficiency analyses are therefore of great value. Certain health care services with a defined and limited scope are relatively inexpensive, but are nevertheless highly effective for specific purposes in appropriate circumstances. School health services, student health services, and occupational health services are notable examples.

A health plan is necessarily unique to the country to which it relates, whether developing or developed. It is true that some general principles of approach and method in planning are universally applicable, but local circumstances and priorities differ greatly because of such factors as demographic patterns, disease patterns, resources, social and political philosophy, general social system, existing health services, organizations, and the form of existing institutions. Health planning is most effective when it is a part of overall planning.

The experience, including the mistakes, of the developed nations can be useful to countries in earlier stages of development. The less developed countries should not fall into the error of copying uncritically

the institutions and practices of the developed countries, where the system is often outmoded and in the process of being radically amended.

Health education has an essential part to play both in the health services and in wider socio-economic spheres. As major policy decisions are in the last analysis mainly political, and therefore subject to the pressure of public opinion, identification of the right priorities depends to some extent on the public being sufficiently informed to demand the right thing and to avoid, for example, demanding highly expensive remedial procedures when well-tried preventive programmes would yield much greater benefits. It is also self-evident that a great deal of serious disease and costly medical care can be avoided if the public knows what steps to take on its own behalf and is motivated to take them.

The education and training not only of health workers, including practising physicians and health administrators, but also of economists and others involved in planning leave much to be desired. Only about one-third of the world's schools of public health at present include health economics, sociology, organization and management, and research methodology in the basic postgraduate public health course for physicians and others, and there are relatively few advanced courses in these subjects. Yet all public health administrators require knowledge of these subjects at a basic level and senior health administrators and planners require greater knowledge. Economists involved in planning also require a background knowledge of health and health services.

Advanced training, in particular, requires an interdisciplinary approach and is often most effective when studies are pursued by multidisciplinary groups.

While the advisability of introducing health economics as a subject in the undergraduate training of physicians is perhaps open to question, undergraduate medical education should include an orientation towards community health and an introduction to the doctor's responsibilities in organized health services.

Scientific and applied research is greatly needed and must have a multidisciplinary basis in order to provide factual and statistical information about all the various impacts of health programmes (health statistics, evaluation methods, behaviour, etc.) and a better understanding of the factors linking health and other socio-economic fields.

Much of this work could be done by university teams, at least partly as academic work. Such a procedure would contribute to better practice by improving theory and would reinforce theory by testing it in application.

Work should continue on the promotion, encouragement, and support of research on the standardization of nomenclature, systems of health statistics, indices of health and socio-economic development,

evaluation methods, and health economics theory and practice. Of particular value would be:

- (a) a manual or guidelines for textbooks and other teaching material on health economics; and
- (b) a continuing bibliographical service to countries on this subject.

ANNOTATED BIBLIOGRAPHY

Abel-Smith, B. (1963) *Paying for health services*, Geneva, World Health Organization (Publ. Hlth Pap., No. 17)

The aim of this volume is less to compare the cost and means of financing health services in the six countries considered than to help establish a common language. Clear definitions are given of the economic concepts considered in regard to costs (investment expenses and everyday running expenses) and sources of financing (direct and indirect payments). Medical concepts are also defined, the broad categories considered being medical care, public health activities, training, and research.

Abel-Smith, B. (1967) *An international study of health expenditure and its relevance for health planning*, Geneva, World Health Organization (Publ. Hlth Pap., No. 32)

This study aims both at collecting comparable data on the sums spent by the different countries on health services and at establishing a standardized system of national accounting that will make international comparisons possible. An analysis of 33 countries shows a great diversity in the total amount and the breakdown of health expenditure by country, arising less out of real needs than out of economic conditions and cultural and historical influences. The national accounting systems in force in the different countries are such that it is not possible to determine the total health expenditure. The author stresses that a study of the cost of health services is of limited interest in the absence of a parallel study of their effectiveness, i.e., of the benefits received from them.

Banerji, D. (1967) Health economics in developing countries. *J. Indian med. Ass.*, **49**, 417-421.

The author stresses the role of health as a contributor to economic growth and the need to integrate health activities into general economic activities so that the former do not interfere with the latter or vice versa. The tasks assigned to health economists in cooperation with planners include the development of instruments for measuring social phenomena; the identification of the fields of health where the maximum results can be obtained with the available resources; and the provision of aid in improving the management of health services (e.g., in hospital establishments).

Barlow, R. (1968) *The economic effects of malaria eradication*. Ann Arbor, University of Michigan School of Public Health (Bureau of Public Health Economics, Research Series No. 15) 167 p.

This study presents a methodology for measuring the long-term effects of malaria eradication on per capita income and applies that methodology to Ceylon for the period 1947-1966. It is based on the conclusions of P. Newman in regard to

the demographic consequences of eradication (held to be responsible for 60% of the increase in the demographic growth rate observed in Ceylon). The author uses a simulated model for measuring the effects of a health programme on economic growth. When applied to eradication the model reveals the effects on the per capita income, the manpower available, and capital. The results indicate that eradication leads to a short-term increase and a long-term decrease in per capita income. The validity of the results depends on the validity of the model; the model employed seems unable to reflect the true situation, especially as regards the long-term aspect and the structural changes and interactions between demographic and economic changes.

Bogatyrev, I. D. & Rojzman, M. P. (1969) Methods of studying the economic benefits of disease control. In: WHO Regional Office for Europe, *Health economics. Report on a seminar, Moscow, 25 June-5 July 1968*, Copenhagen, pp. 32-35

The authors describe the application of cost/benefit analysis in the USSR to the campaign against poliomyelitis carried out in 1955. The effect of the measures was observed over the period 1958-1965. The costs of the campaign include those of the research operations effected as from 1955, vaccination, and treatment (medical visits, transport, hospitalization). The losses prevented by vaccination were estimated by evaluation of the number of new cases that would have developed if the 1958 morbidity rate had continued. The overall losses avoided included: the cost of treatment and rehabilitation; losses due to the incapacity or reduced activity of a certain number of patients and comprising the pensions paid and the loss of revenue resulting from the fall in activity; and losses resulting from deaths. Losses connected with reduction in manpower were assessed on the basis of the national income per worker (and not on the basis of the average wage). In this particular case the ratio between costs and benefits was 1:66.

Brunet-Jailly, J. (1971) *Essai sur l'économie générale de la santé*, Paris, Cujas, 928 p.

This economics thesis is an important contribution to the field of health economics and to knowledge of the health system in France. The instruments available for analysing the health sector are inadequate—particularly the national accounting systems—and do not make it possible to show how health activities are integrated with the economy. The author makes a structural analysis of the health sector. The first part studies the structure of the production units in the health sector (medical profession, establishments, etc.), their characteristics, and the manner in which they are organized to produce medical services. The second part studies the mechanisms of the health sector so as to show how the provision of medical services operates. The input is represented by work and capital (including research and teaching), the output by medical consumption, this depending on certain variables (income, urbanization, etc.). The analysis of financing reveals the decisive role of the state in the field of health and raises the problem of the rationale of state intervention. The third part considers health within the broader framework of the whole economic system. Economic analysis has recently endeavoured to define the concepts and clarify the measurements of two groups of problems: the benefits from expenditure on health and the economic value of man. The author studies in detail the cost of economic activity to man (effect of working conditions on demography and the state of health and the economic cost of disease at the national level).

Correa, H. (1963) *The economics of human resources*, Amsterdam, North Holland Publishing Company

This work analyses the economic aspect of human resources, which affect economic life as production factors and as the final benefactor of socio-economic

progress. Although centred on the economics of education, it is of considerable interest methodologically in relation to health economics. The productive function of work is analysed, i.e., the factors governing the quantity and quality of the labour force. Indices established for several countries reveal differences in working capacity resulting from variations in health status or nutrition, or both combined. The quality of the labour force is governed essentially by education, which is studied in detail from two points of view: the interaction between socio-economic phenomena and the demand for education, and the link between the process of education and the qualifications obtained. The study also analyses the connexion between total production and labour from different angles, especially the influence on production of the characteristics of the labour force (health, education, etc.) and the decisive role of education as factor in economic development.

Correa, H. & Cummins, G. (1970) Contribution of nutrition to economic growth. *Amer. J. clin. Nutr.*, **23**, 560-565

The effects of malnutrition are well known, but only limited information is available on the link between improved nutrition and increased productivity. This study, covering 18 countries for the period 1950-1962, reveals that in 9 countries of Latin America an increase in calorie intake made a contribution of nearly 5% to the rise in the national product, whereas the contribution was zero in the economically developed countries. The poorer the country, the greater the role of improved nutrition in its development.

Crystal, R. A. & Brewster, A. W. (1966) Cost/benefit and cost/effectiveness analyses in the health field : an introduction. *Inquiry*, **3**, No. 4, 3-13

This article is an introduction to the cost/benefit and cost/effectiveness analysis techniques used to an increasing extent as an aid to decision-taking, especially as concerns health programmes. Cost/benefit analysis in the health sector enables the benefit to society resulting from the implementation of a given programme to be determined. Cost/effectiveness analysis comprises the use of analytical and mathematical procedures for making a choice between various alternatives. Cost/effectiveness models for each alternative can be constructed in three steps (definition of aims, evaluation of alternative means, and definition of the resources necessary). These techniques, although helping to clarify the issues, do not dictate decisions to the planner but enable a certain amount of rationality to be introduced into a system only too often characterized by its irrationality.

Destanne de Bernis, G. (1966) *How to integrate health planning into the planning of economic development as a whole.* Unpublished WHO document.¹

The improvement of health planning and its better integration into economic planning as a whole calls for a definition of the links between economy and health. This article is the contribution of an economist to the economic analysis of health. Health is a means of development as well as a consequence and one of its aims; from the viewpoint of economic analysis it is neither pure consumption nor pure investment. The traditional economic classifications do not make the economic nature of health very clear; health is an "incompressible consumption" necessary to ensure the survival of the individual and the population, and also a "development consumption", i.e., a benefit that ensures economic development because it makes individuals more productive and raises the level of satisfaction of the population. The economic effects of health expenditure are both direct—increased satisfaction—

¹ A limited number of copies of this document are available on request to persons officially or professionally interested in the subject from Community Health Services, World Health Organization, 1211 Geneva 27, Switzerland.

and indirect— increased inducement to change, increased production because of the increase and improvement in the labour force and the application of new resources. Measurements of these effects poses many problems connected with indirect effects, the assignment of certain effects to a given cause, comparisons in time, and the fixing of costs. The fundamental difficulty is the impossibility of assigning a value to certain factors—such as human life—which yet play a central part in planning. The links between health and economics have other aspects: the improvement of health following changes in the environment outside the health sector (nutrition, sanitation, etc.), and the endeavour to increase the effectiveness of an activity by linking it with general activities (health education with education as a whole, for example).

Drewnowski, J. & Scott, W. (1966) *The level of living index*, Geneva, United Nations Research Institute for Social Development (Report No. 4), 90 p.

One of the aims of the United Nations Research Institute for Social Development is to study the links between economic and social development. Its efforts have centred on the clarification of certain basic concepts (level of wellbeing, social capital, socio-economic development, etc.) and their quantification. A level of living index was prepared and applied to certain countries. The level of living is defined as the level of satisfaction of the needs of a population ensured by the flow of goods and services it enjoys over a given period. The general level of living can be divided into several components corresponding to different groups of needs: physical (nutrition, housing, and health), cultural (education, recreation, security), and others. The final level of living index is the weighted result of a number of intermediate indicators. Statistical and theoretical problems arise, especially in relation to the weighting of the various factors. The study attempts to apply such an index to 20 countries with varying socio-economic levels. Despite the limited conclusions that can be drawn from it, it shows the importance of such an index in the measurement of levels of development.

Feldstein, M. S. (1967) *Economic analysis for health service efficiency: Econometric studies of the British National Health Service*, Amsterdam, North Holland Publishing Company, 322 p.

The author's aim is to evaluate economic information that would render it possible to improve the effectiveness of the National Health Service (NHS) in Great Britain. In view of the special features of the NHS (absence of market mechanisms, decentralization of decisions), the classic regulators of economic activity do not apply. By means of economic analysis the health system can be analysed, its effectiveness measured, the optimum combination of production factors (staff, equipment, etc.) determined, and the goals of production fixed. In the first part of the study the author analyses the hospital as a production unit. He assesses the costs and productivity of 177 hospitals treating infectious diseases on the basis of three indices: a cost index, a hospital productivity index, and an input effectiveness index. The influence of the size of the hospital on costs is then analysed. The author next constructs a number of econometric models for determining the optimum allocation of resources and draws attention to the importance of medical staff expenditure in increasing the effectiveness of the hospital system. Different factors govern the extent to which hospital beds are utilized and it is shown that increased effectiveness is possible without the provision of new beds. The study deals with confinements in hospitals and the factors involved (membership of a well-to-do class, nearness to hospital, and the attitude of doctors play just as great a part as the possible risks of confinement at home). The second part deals with the planning of the health system as a whole. It is impossible to determine the

level of hospital bed needs from demand, since demand is closely linked to supply, as is shown by regional inequalities. A general model of the health system including, besides hospitals, domiciliary care and services given by practitioners is needed to give a better picture of the functioning of the health system as a whole and serve as a basis for sound planning. The author proposes a general model and suggests ways of making it an operational instrument.

Huszar, T. & Todor, A. (1969) Etude des conséquences d'une maladie chronique pour l'Etat et pour la famille. *Santé publ. (Buc.)* **10**, 203-215

This paper describes a methodology for the evaluation of the financial and social cost of ulcers, for the state as well as for the patient's family. The state expenses are of three kinds: loss of production because of reduced working capacity, health expenses, and welfare expenses (pensions, etc.). The family must, apart from direct expenses (cost of treatment, cost of replacing an essential person, etc.), also cope with a fall in income. The methodology was applied to 50 patients hospitalized for ulcers, but a certain number of costs could not be evaluated (especially the economic cost of premature retirement or a fall in output).

Klarman, H. E. (1963) The distinctive economic characteristics of health services. *J. Hlth hum. Behav.*, **4**, 44-49

The author describes the specific economic characteristics of health services that differentiate them from other services. Medical care corresponds to an objective need, not linked to ability to pay, and is regarded as having priority. Illness cannot be foreseen in terms of individuals but can be foreseen in terms of groups, so that the financial resources to cope with it must be calculated on an overall basis. The "consumer" has no clear idea of the effectiveness of medical care, which he can judge only with difficulty. The profit motive is lacking in certain cases and cannot be used to explain behaviour. Health and education are sometimes "linked products", in the case of university hospitals for example. Economic systems play an important part, especially in the field of prevention.

Langer, A. & Henshaw, P. S. (1955-1956) The interacting effects of public health, fertility behavior and general economy on standards of living. *Amer. J. med. Sci.*, **230**, 119-127; 484-490; 605-621; **231**, 407-425

A global index was constructed by the authors for classifying countries in accordance with various factors (birth rate, mortality, population increase and density, calorie intake, energy consumed, income per head). Countries can be classified in broad categories in accordance with this index and the authors feel that the factor or factors stimulating or blocking economic development can be deduced. Different calculations are made in the study to discover how to maintain or improve the level of living in countries at different levels of economic development. Health activities should be undertaken in a planned and balanced manner. In the first stages of development they may well yield economic benefits as great as those of investment in other sectors.

Levin, A. L. (1968) Cost-effectiveness in maternal and child health; implications for program planning and evaluation. *New Eng. J. Med.*, **278**, 1041-1047

This study briefly discusses the results of cost-effectiveness analysis applied to 10 maternal and child health programmes. The results are presented in terms of deaths avoided, handicaps prevented, etc. The author stresses the limits of such a method of analysis as a decision-taking tool in the health sector. It is necessary, however, so as to arouse awareness of the lack of basic data, encourage the better use of resources, etc. It should find a place in the overall analysis of the health system of which the various special programmes form part and should stimulate research on health indicators.

Logan, J. A. (1963) The quantitative relationships between community water supplies and economic development. *Int. Rev. trop. Med.*, 2, 27-40

The author stresses the different economic aspects of water supply and the contribution of water to general socio-economic development—agricultural development, the establishment of industries using water or producing hydraulic equipment, and health improvement. It is difficult to assess the role of water supply in development from the health angle, since knowledge of the part played by water in the improvement of health is unsatisfactory. The author mentions, however, calculations already made concerning the economic effectiveness of water supply (number of deaths and diseases avoided, savings made by health services).

Macchiavello, A. (1962) La evaluación del impacto económico de las actividades sanitarias. *Bol. Ofic. sanit. panamer.*, 52, 25-39

The differences and resemblances between the field of economics and the field of health and the economic and health situation of Latin America are described. An attempt is then made to set out the statistical data required for assessment of the impact of health activities on the economy. It is necessary to detail the public health programme of action and to know what activities are actually undertaken and what results obtained. The aim of evaluation is to check the degree of health improvement obtained by the activities carried out. Evaluation takes place at different levels of the activities, of the programme, and of the plan as a whole. As regards the economic effect, it is necessary to develop statistical research of a new type so as to measure both the health and the economic effect ("sanimetric" measurements).

Musham, H. V. (1970) Sur les relations entre la croissance de la population et le développement économique. *Population*, 25, 347-362

The controversy raised by the problem of population growth and economic development is long-standing (since Malthus) but is still topical. Many works dealing with developing countries (especially those devoted to the effects of health expenditure) consider that population increases lead to a fall in per capita income. The author analyses the two most recent theories in favour of this thesis: the theory of the hindrance to economic investment constituted by demographic investments, and the "mousetrap" theory formulated by R. R. Nelson, linking the difficulties of initiating economic growth with demographic tendencies. The criticisms of these two theories are insufficient in the author's opinion to invalidate them, but a more thorough analysis would make them more valid. In view of the lack of knowledge of demographic data and trends in developing countries (especially in relation to the demographic transition phase), these theories and the criticisms made of them cannot be subjected to empirical observation.

Mushkin, S. J. (1958) Towards a definition of health economics. *Publ. Hlth Rep. (Wash.)*, 73, 785-793

Health economics is concerned with the optimum use of the economic resources allocated to treatment of illness and promotion of health. The basic problems are of two kinds. One is the organization of the health services "market". This has specific characteristics (partial absence of the profit motive, role of prices, special behaviour of the consumer, etc.) and economists are little interested in it. The other is the economic effects of health investment; economists have considered various aspects such as the part played by population growth in economic growth, the "value" of human life, and the relation of cost to benefit. The author rejects the possibility of utilizing consumer's preference as a guide for the allocation of resources for disease control and health promotion, and stresses the need to take into account the effects of the health programme on production.

Mushkin, S. J. (1962) Health as an investment. *J. polit. Econ.*, 70, No. 5, Part 2, Supplement, 129-157

This paper is an important contribution to the analysis of health within the framework of the theory that considers man as capital necessitating investment (especially health and education) in order to make him productive. The first American studies on the formation of "human capital" centred on education (Schultz), and on the basis of these studies the author discusses the part played by investment in health. He analyses the similarities and differences between education and health, then the theoretical problems of health and work: those of assessing the gain to productivity from elimination of illness (effect of debilitating disease, combined effects of several illnesses, etc.) and of measuring the activity of women in the home, the potential length of the working life, etc.; and those of evaluating the benefits to production from improved health. Studies have been undertaken on the "developmental cost concept" approach, which aims at measuring the overall cost of bringing a child to the stage of being productive (once he is adult, his production is analysed as the return on the initial investment); on the "measurement of expected future benefits" approach, which originated in insurance practice but has aroused renewed interest as a result of cost/output analyses; and on the measurement of the contribution of the suppression of an illness to economic growth.

Myrdal, G. (1952) Economic aspects of health. *Chron. Wld Hlth Org.*, 6, 203-218

This article is one of the classics of health economics. It is among the first contributions by an economist to a study of the economic importance of health. The author stresses the difficulties encountered in the economic analysis of health problems and stresses the need, as a conceptual framework, for a dynamic theory of social evolution showing how changes in one of the elements of the system can cause a transformation of the whole system through its cumulative effects. A health programme acquires meaning only as part of a general programme. Failing the possibility of a global calculation of the economic effectiveness of health programmes, it is possible to employ various approaches that do not cover all the causes and effects involved in social life (cost of different programmes, effectiveness of management, etc.). Although these partial approaches are important, studies of the basic questions remain necessary.

Navarro, V. (1969) Systems analysis in the health field. *Soc.-econ. Plan. Sci.*, 13, 179-189

Health constitutes a system that can be broken down into subsystems (hospital treatment, domiciliary treatment, etc.). It is possible to study the movement of individuals through each subsystem (admission of patients, movements between departments, discharges). This article examines the application of systems analysis to the field of health service planning. The author reviews different planning models that have employed the systems analysis approach, and discusses their limitations. The essential difficulties stem from poor knowledge of the relationships between the various factors of the system and the results obtained (output). An additional difficulty concerns the definition of aims and the problem of selecting representative health indicators (mortality, morbidity, debility, dissatisfaction, etc.). The utilization of health status as an indicator of level of social development and the place of health in global development models are discussed.

Newman, P. (1965) *Malaria eradication and population growth with special reference to Ceylon and British Guiana*, Ann Arbor, University of Michigan School of Public Health (Bureau of Public Health Economics, Research Series No. 10), 259 p.

In this study an attempt is made to measure the effects of malaria eradication on the growth rate of the population in Ceylon and British Guiana, where eradication campaigns were carried out and caused a rapid drop in malaria prevalence. On the basis of demographic data for the period 1930-1960 and of a model for evaluating what the population growth would have been without eradication measures, the author concludes that eradication has played a major role; he estimates that 60% of the population increase observed is accounted for by the eradication campaign. Apart from its direct effects, the campaign has helped indirectly to decrease mortality since, he estimates, the deaths recorded as due to malaria constituted, before eradication, only one-fifth of deaths associated with malaria (the debilitating effects of the latter promoting mortality from other diseases). The study contains an analysis of interactions between malaria and other diseases, of probability of death by age, and of the effect of malaria on fertility in Ceylon.

Rice, D. P. (1966) *Estimating the cost of illness*, Washington, United States Public Health Service (Public Health Service Publications, No. 947-6), 131 p.

This study estimates the economic cost of illness, disability, and premature death in the USA for the year 1963. A distinction is made between the direct cost of illness (the running and investment cost of public and private health services), which is evaluated by type of service and by category of disease, and the indirect cost, the production loss due to disability and premature death, which is calculated on the basis of the number of years of work lost and the average annual earnings. Several problems of method are discussed: the presence of several diseases, non-quantifiable aspects such as suffering, the evaluation of domestic work by women, etc. The overall cost should include the present value of future losses brought about by a disease existing at the present time. The author considers that the planner should employ such evaluations in the allocation of resources to different programmes or in comparing alternative programmes. Such "economic arithmetic," however, is not the only factor to be taken into account in a health programme, in which factors such as the alleviation of suffering should be the prime consideration.

Rice, D. P. & Cooper, B. S. (1967) The economic value of human life. *Amer. J. publ. Hlth*, 57, 1954-1966

Quantification of the value of human life is not new (it is used by insurance companies) but it is encountered to an increasing extent in cost/benefit studies of health. The aim of this study is to provide precise estimates that could be used by planners. The economic value of an individual is defined by his productive capacity and based on the average income per age group, taking into account the average expectation of life at each age. Different values of human life are calculated for the USA in terms of age, race, sex, and educational level. Detailed tables are provided.

Robertson, R. L. (1967) Issues in measuring the economic effects of personal health services. *Med. Care*, 5, 362-368

This paper sets out basic concepts in relation to the measurement of the economic effects of personal health services, essentially in terms of the working time gained by the decrease in illness and accidents. Inputs are defined as the cost of services supplied and the problems envisaged are related to measurement, the combination of several inputs, and non-quantifiable inputs. Outputs (effects) are defined as working time saved, and a problem discussed is the fall in productivity due to a debilitating disease. Also discussed are the connexion in time between inputs and outputs and the existence of "disease complexes" making analysis of the effects of one disease difficult.

Scott, N. (1967) La planification et l'analyse coût-avantage des investissements sociaux. *Bull. Inst. internat. Etudes soc.*, No. 2, 4-54

The first part of this paper discusses general planning techniques and the different levels at which they are situated—global, sectoral (health for example), and production unit (project). The second discusses the role and limits at each level of cost/benefit analysis, defined as a method of expressing total costs and benefits in terms of social value or utility and not only of monetary values. The three chief questions are (1) the scope of such an analysis; (2) how the costs and benefits can be assessed—in the absence of market prices what nominal prices should be adopted and how can collective benefits be evaluated; and (3) as the investments are considered over a long period, how present costs and future benefits can be compared. A study is included of two concrete examples not concerning health (rehabilitation of manpower and rehousing).

Seale, J. (1963) Economic benefits of medical care. *Brit. med. J.*, suppl., 115-117

The author refutes the criticisms of those who believe that health expenses fail to contribute towards increasing the national revenue and that medicine, by increasing the inactive population, is leading to economic disaster. He stresses the role of health expenditure as investment expenditure and not merely as consumer expenditure. The increase in the inactive population has not been proved—advances in health have not had much effect in causing aging of the population, the drop in mortality affects various age groups, the concept of inactivity is linked to many other factors of a social nature, etc. Medical progress has helped especially to decrease mortality in children and producers of wealth. The prevention of child wastage and the reduction of the incidence of disease represent an economic gain for society. Health expenses will continue to grow, because the health aspirations of the population are increasing, the cost of services is rising, and populations with fewer deaths require more health care. It should, however, be borne in mind that the reasoning behind the decisions taken in regard to health is complex and that economic benefits are only a byproduct, not a primary aim.

Stich, Z. (1966) Health care and economic planning. *Santé publ. (Buc.)*, 7, 19-25

The author stresses the complex nature of the links between health and the economy. The usual approach of economists is to classify health expenditure as consumption expenditure because it produces no material goods; but the correlation between health expenditure and the maintenance of working capacity—the very basis of production—indicates that it must be regarded in part as investment. It is impossible to reduce health evaluation to monetary terms, but it is useful to estimate the economic loss caused by health deterioration.

Taylor, C. E. & Hall, M.-F. (1967) Health, population, and economic development. *Science*, 157, 651-657

The authors maintain that health is a particularly important asset for the peoples of the developing countries. The fact that economic growth has been below that forecast and less than the population increase has caused a reaction among some persons against health programmes, which they deem too effective. On the one hand, however, the positive results accompanying the development of health programmes are real: exploitation of new land, improvement of and increase in the labour force, and changes in attitudes and behaviour. On the other hand, the evidence shows that a minimum health level is necessary for populations to agree to limit or space births; moreover, a minimum organization of the health services is essential for the implementation of a family planning policy. In sum, the maintenance of health activities at a relatively high level in developing countries is justified not merely on humanitarian but also on economic grounds.

WHO Study Group on the Measurement of Levels of Health (1957) *Wld Hlth tech. Rep. Ser.*, No. 137

Among the problems of measurement of levels of living, that of the measurement of health levels occupies a central position. Health, a very broad concept, lends itself poorly to objective measurement; direct measurement of health status is often impossible and, in practice, indicators concern states that deviate from health but can be measured. Three groups can be distinguished: indicators of the health status of individuals or groups; indicators of environmental conditions that may have an effect on health status; and indicators of the activities of health services. This report reviews the indicators traditionally used and suggests that a search for other indicators should be encouraged (particularly for measuring the level of mental health or the influence of environmental factors).

World Health Organization (1962) *The economic value of preventive medicine and organized health services.* United Nations Conference on the Application of Science and Technology for the Benefit of Undeveloped Areas. (Document E/CONF. 39/F/145)¹

The contribution of preventive health services to economic growth is considered from two angles—first, the results obtained in the fight against malaria, tuberculosis, and other diseases (decrease in mortality and morbidity and estimated economic gains in certain fields); second, the health organization of four countries and the improvements in health that have been achieved (particularly the increase in life expectancy).

World Health Organization (1971) *The economics of health and disease.* *WHO Chron.*, 25, 20-24

This article summarizes the main findings of a seminar on health economics organized by WHO in Moscow in June-July 1968. The seminar discussed the role of health economics when confronted with increasing health expenses, especially in determining how best to use resources. Health economics has an essential task in relation to the management of the "health industry" and the effectiveness of health services. Furthermore, it supplies a basis for making a choice between several alternatives, once the goal to be achieved has been fixed. Studies of health economics are important in determining the economic advantages of disease control. In regard to planning, profitability or effectiveness studies are useful, but also have their limitations; problems they raise are those of identifying and measuring all the benefits and the period during which costs and benefits should be studied.

¹ A limited number of copies of this document are available to persons officially or professionally interested in the subject from Community Health Services, World Health Organization, 1211 Geneva 27, Switzerland.

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