HEALTH SERVICES:
CONCEPTS AND INFORMATION
FOR NATIONAL PLANNING
AND MANAGEMENT

Experiences Based
on the
WHO/International Collaborative Study of Medical Care Utilization

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FOREWORD

A large comparative study of health care services in 12 study areas in seven countries was begun in 1964. Known as the World Health Organization/International Collaborative Study of Medical Care Utilization, its report was published in 1976 under the title Health Care: An International Study.¹ This presented the results of research on population groups representing more than 15 million people in an attempt to answer questions relating to the health care needs of populations, the organization, resources and use of health services, some factors influencing the patterns of use, and some methodological problems. The study is briefly described in Chapter 3 of this volume.

The World Health Organization felt that the main study report was too detailed and voluminous to be immediately useful to some health policy-makers, administrators and planners and encouraged a subgroup of the study collaborators to prepare the present volume, which attempts to link some of the thinking and findings to the wider national concerns of many countries. Those whose interest it has aroused or who seek further details will refer to the main study.

No two readers of any book see quite the same things in it or put it down with quite the same understanding. What may be highly relevant and interesting to some may be regarded differently by others. However, in this volume there is a consistent thread and a message which appears to be important and which warrants examination and action.

There do appear to be a series of health service crises in different countries in the world as health-related needs change; and the acceptable responses to them also change, as judged by our awareness of their usefulness, their applicability and their acceptability. At the same time the social injustice of the maldistribution of health care is becoming unacceptable in many national contexts. While the necessary adaptations of health care systems to these pressures are clearly as much a political as a technical process, the investigators argue in this book that such adaptations can be planned or influenced by "intelligence". They make a distinction between "data", "information", and that blend of information with perceptions of social and political values which they call "intelligence". In making this claim they propose some essential preconditions that affect all levels of this pyramid of knowledge designed to influence the form of a decision, and the primary one is that it should be population-based in addition to using data from users or institutions, so that the two can be related. Their argument seems sound and conceptually links health service thinking with that of epidemiology and health statistics.

If this central idea is accepted, the reader can enjoy himself with the examples. He may well say that the questions asked are not the most relevant questions in his national setting or that this or that indicator or form of presentation is unsuitable for him and another will need to be produced. I am certain that the authors would encourage such an attitude and might even themselves urge that new questions be asked and new indicators used. What they would argue for would be that a continuation or elaboration of such thinking could result now, with our present knowledge and methods, in many forms of meaningful action that could be taken to assist in choosing among a wide range of possible decisions. If their argument proves persuasive, this volume is clearly useful.

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CHAPTER 1

CONTEMPORARY PROBLEMS
AND ISSUES IN THE HEALTH SERVICES

WORLD-WIDE CONCERN ABOUT HEALTH AND THE HEALTH SERVICES

The need for new ways of thinking about the problems of health and health services stems from world-wide concern for social justice and for improvement in the well-being of all people, but especially of the disadvantaged. This concern is increasingly expressed as dissatisfaction with the uneven distribution, rising costs, and uncertain outcomes of health services. It takes different forms in different countries, regions, and areas, but certain common problems have been identified in recent work of WHO,1 the United Nations Research Institute for Social Development2 and the UNICEF-WHO Joint Committee on Health Policy.3 Four themes recur throughout these and other publications that justify the application of the term “crisis” to the present state of affairs.

First, there is a feeling of helplessness and doubt about whether useful and usable scientific knowledge, or even appropriate care, will ever be brought to bear on the great bulk of health problems that affect most of the people most of the time. Second, this widespread feeling has led local and national communities to take action to fulfil human needs and aspirations and to emphasize self-determina-

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tion as the relevant political mechanism. This in turn stimulates demands from the periphery, generating political forces that push those responsible for planning in all sectors, but especially in the health sector, to reconsider goals, objectives, and priorities in the light of local, regional, and national values and expectations. Fourth and finally, these processes find their dominant contemporary expression in the renaissance of basic or primary health care as the fundamental service in any balanced health care system.

WHO'S CURRENT CONCERN WITH WORLD HEALTH PROBLEMS

WHO and its Member countries are increasingly aware that the health of populations is the result of many influences and involves many sectors concerned with social developments other than health; effective planning for health therefore requires coordination between the health and other sectors. The problems involved have many dimensions that are specific to each individual country and to each local area within a country, but they all fall under three major headings:

1. The need for improvement in the coverage and content of health services;
2. The need for improvement in the concepts and processes used in planning health services;
3. The need for improvement in the form and content of the information available for the planning and evaluation of health services.

MAJOR PROBLEMS AND ISSUES IN THE PROVISION OF HEALTH SERVICES

These shifts in priorities, and the urgency with which they are applied to health care systems, stem only partially from the increase in the cost of services and dissatisfaction with their distribution. They have other causes, some of which, as suggested by the experience in the WHO/International Collaborative Study of Medical Care Utilization1 on which the present work is based, are amenable to assessment.

Equity of distribution and adequacy of coverage in relationship to need

The large proportion of the population in many countries lacking any possibility of contact with the health services is a matter of world-wide concern. In all countries the increasing proportion of health care services paid for from public funds, through either general taxes or deductions from pay, justifies according high priority to equity of distribution and adequacy of coverage. In fact, the health care system is being subjected to the same social, economic, and political pressures in relation to distributional equity as already exist for income, social security schemes, housing, and work. No longer are communities prepared to accept the distribution of health services and access to those services as a matter of chance or as an expression of distorted local priorities, pressures, or privileges.

To the extent that efficacious care exists, it is of great importance that all who can benefit should be provided with services that are not only effective, but are also distributed in an appropriate and adequate manner. Services of dubious value should not be continued, and the unwarranted use of expensive services by the few should be severely curtailed or terminated, especially when it is at the expense of useful basic services for the many. The International Collaborative Study has demonstrated how differences in the coverage of services by age, sex, and levels of perceived morbidity can be measured and compared and, to a limited extent, how differences in health care systems and their priorities are reflected in differences in use.

Efficacy of intervention and benefits derived in relationship to resources allocated

Many doubts are being expressed about the intrinsic benefits and relative value of specific forms of preventive, curative, and restorative intervention, and about the efficacy of individual tests and treatments. What exact evidence is there that a particular drug or operation is useful for the purposes for which it is advocated rather than harmful or useless? How does it compare with measures it is designed to replace or even with doing nothing? This is an arena for the objective assessment of benefit and it covers the use of randomized controlled trials and other scientific methods of evaluation. In all countries those responsible for planning and managing health care systems should ask for scientific evidence, instead of pronouncements claiming
authority, on which to approve decisions to pay for new procedures from public funds or even to approve their introduction for use by anyone.

*Effectiveness and efficiency of health services in relation to use*

Technology may be of benefit in contributing to increases in the gross national product where this has been a societal goal; but where distributional equity, adequacy of coverage, social justice, and improvement of the net economic welfare of all the people are the aim, most new technologies in health have to be regarded critically. Thus, a distinction has to be made between what has been called "half-way" technology and a fundamental technological advance. The former is represented by the "iron lung", a mechanical device for managing afflicted poliomyelitis patients, the latter by the Salk vaccine, a method of prevention based on fundamental research. An assessment also has to be made of the utility of a service. The fact that a new test can be performed by a labour-saving automated machine with a reduction in unit cost is not a sufficient reason for introducing it and thus increasing the number of tests performed unless it can also be shown that useful treatment at reasonable cost can be provided through an effective health care system for the larger number of persons that can be tested. Moreover, the financial and clinical impact of the introduction of half-way technology affecting large numbers, or of fundamental technology affecting a few, must always be weighed against the loss of contact this may involve between people who work in the health care system and those whom they serve. Proximity to a personal source of care or an appropriate entry-point to the health services may be of greater benefit to the population than the availability of sophisticated but remote equipment and care.

As a smaller and smaller proportion of many populations seems to be consuming an ever larger proportion of the resources available, there is a need to see that efficacious forms of intervention are provided for all those in the population who could benefit from them or to whom they could be effectively applied. Priority should therefore be accorded to technological and organizational solutions for the important problems that affect large numbers of the population. Sometimes there is no known effective solution, in which case more biomedical or health services research is indicated. More often than not, however, what is required is a change of priorities or the recognition that change of the system is needed in order to make
use of present knowledge. The result achieved by any health care system should be an improvement in the level of health of the whole population. The improvement is a measure of the effectiveness of the entire health care system and must be judged in terms of physical and social dysfunction as well as of satisfaction and comfort. The extent to which beneficial outcomes are distributed equitably among all those in the population who are in need and by means of the optimum allocation and use of resources is a function of how efficient the health care system really is. An efficient system that manages to provide beneficial services equitably is also an effective system.

The conventional medical model in comparison with behavioural and sociopolitical models

The conventional medical approach to the problems of health and disease has tended to emphasize the role of single causal agents, especially microorganisms, and in the past to minimize the role of the environment and of personal or host factors in the genesis of disease. Extended to the use of health services, this approach has again emphasized the role of biologically defined disease and underplayed the role in the genesis of ill health of psychological, social, and cultural factors such as emotional reactions, inadequate housing, and attitudes towards smoking. The implication of this approach when applied to the political and social sphere is that ill health consists of "diseases" whose "cure" or "eradication" will maintain or restore "health".

Contemporary biological and psychological thought, increased interest in systems theory, and mounting evidence from clinical, organizational, and political experience favour the use of much broader conceptual models for understanding the manifestations of health and illness, the use of health services, and the deployment of resources to maintain, restore, and improve levels of health. Each individual possesses psychological and physiological sensing devices and controls which interact with each other and constantly determine how his body will respond to internal awareness and experiences and to external stimuli from other individuals and from the social and physical environment. This psychobiological approach can be extended to a behavioural one which looks at how an individual behaves in the presence of health and sickness, and thus how he uses or does not use the health services. Finally, such an approach can be extended still further to a "societal" or "political" context, in which appropriate sensing devices collect and produce information which is eventually used by decision-makers to assess the utilization by
whole populations of the health services and to control the organization of health care systems and the allocation of resources to or within them.

Information about the perceived health needs of populations is seen to be an essential requirement for the final stages of decision-making. Although these stages are basically political in nature, the decisions can be guided by evidence and logic and should be influenced by the contributions of both the biological and social sciences.

OBJECTIVE OF THIS VOLUME

Our objective in this volume is to present and extend the conceptual, methodological, and empirical findings of the WHO/International Collaborative Study of Medical Care Utilization that are considered to be relevant to health services management and health systems planning. The comparison in that study of human needs with the use of health care resources in 12 diverse study areas in 7 countries was instructive in disclosing important differences and similarities in the organization of health care arrangements. The comparisons resulted in the development of some basic principles that could, in the opinion of the study participants, contribute to a more rational resource allocation and health care organization. The sharing of information based on the use of a common language can accelerate the application of new knowledge about health services, in a manner analogous to that of the international biomedical community, which has flourished by sharing its knowledge through the use of a common scientific language and standards.

It is the purpose of the present small volume to extend the findings of the International Collaborative Study in order

(1) to make widely available a number of practical strategies for incorporating selected information on perceived health needs and on the use of health services as a basis for guiding resource allocation in the context of behavioural and sociopolitical models supported by empirical research;

(2) to describe the elements and indicators of a practical information base for decision-making in the health sector; and

(3) to demonstrate the relative utility of some of the concepts and methods used in the International Collaborative Study in health care organization, in making plans and choosing among competing alternatives for the allocation of resources, and in managing systems in order to improve their structure, functioning, and results.
It should be emphasized that this is not intended to be a handbook on health planning or management. It does not seek to describe plans for providing health care or methods for developing such plans, nor does it offer any ready-made solutions. It does aspire, however, to being a guide to strategies of planning based on firm sociopolitical, logical and, to a considerable extent, empirical foundations—strategies that deserve further testing and implementation in a wider range of national and local settings.
CHAPTER 2

PROBLEMS OF INFORMATION
IN HEALTH SERVICES ADMINISTRATION
AND PLANNING

Health planning at present is too often restricted to the health sector and is usually based solely on mortality and morbidity statistics, to which are sometimes added data on physician and hospital use. It should instead be based on measures of the health and health care needs of the total population, users and non-users of the health services alike. Moreover, policy decisions in other social sectors affect both the level of health of the population and the type and amount of health services needed. Consequently, since the health planner and health administrator do not operate in a vacuum, the solution to health problems should reflect the social, political, and economic values of society as a whole. To solve health problems the planners must have access to the administrators, and planning must be an integral part of administration. This implies a planning organization built into the administrative structure at each level. If decision-making is decentralized at national, regional, and local levels, planning will be needed at each of these levels, the information required for planning varying in accordance with each level. At the national level, the problems are general and often normative and strategic; at the regional and local levels, they are more of a tactical and operational nature.

There are some rational planning strategies already available which draw heavily upon economic and epidemiological models, computer
simulations, and operations research. ¹,²,³ The application of scientific methods to decision-making would on first reflection appear to render decision-making more objective. Yet the allocation of resources is affected by value judgements about, for example, doctors or hospitals. Moreover, for an administrator of a region or area to approach health care decision-making solely on the basis of the application of scientific method by his planning staff implies or requires acceptance of priorities for resource allocations that have been debated at a higher level, usually at the multisectoral level of government policy-making councils or national planning boards. Is there any hope that decisions at these levels can be improved by country-wide planning?

If planning is to be based upon the needs of a population and to be integrated at each level with social and political values and priorities, it requires an information system that will instruct decision-makers sufficiently. How can the capacity for decision-making be improved? What are the key questions that need answers?

IMPROVING THE CAPACITY FOR DECISION-MAKING

The information systems needed to support decisions on the allocation of resources are different from those needed for planning the operation of a component of the system. They require a different type of analysis before the appropriate decisions can be taken, and they cover many economic and social sectors. Data and information, often implicit, about health, health needs, health services, and the broader manifestations of the quality of life are part of this intelligence system for policy-making.⁴ The same data are often part of the information used directly in the management of an operating health service. While ideally the two functions of decision-making and management should be served by the same types of data, both the quality of the data and the ways of handling them differ; the speed with which decisions must be made and the nature of the evidence required to make changes are markedly different at the two levels.

The development of suitable techniques for a health information system is therefore an important way of improving a country's

² Modern management methods and the organization of health services, Geneva, World Health Organization, 1974 (Public Health Papers, No. 55).
³ KLEczewski, B. M. Planning and evaluation of the community health care programmes. Santé publique, No. 3: 259-278 (1971).
⁴ Quality of life: social goals and measurement, Helsinki, Economic Planning Centre, 1972.
capacity for making appropriate policy decisions. It involves creating a data acquisition system that will monitor what is happening in the area or country, and research and development groups that will undertake analytic functions for the policy-makers. This might be called policy-responsive research, research that will sift the evidence and present it in terms of policy options (each with a rough estimate of the cost in human or economic resources and of time) and analyse the appropriateness of previous policy decisions. In a model for this purpose (see Fig. 1) educational, research, evaluative, statistical, planning, and decision-making processes must be integrated. These will be based on information on societal priorities, health needs, current resource allocation and patterns of services use, as well as on information on feasible alternative courses of action.

However, the existence of an information system and of research and development groups is meaningless without a commitment by administrators and decision-makers to use the information constructively. This should increase concern about the appropriateness and quality of the data, the reliability and utility of the evidence, and the validity of the conclusions. Efforts to improve the capacity of those responsible for planning involve a commitment to improve the decision-making system at national, regional, or community level,
regardless of the sophistication of the health information system. It is better for decision-makers to use the available information sensibly and logically than to construct complex data collection systems that are not capable of improving the quality of decision-making. In short, it is better to be roughly right than to be precisely or elaborately wrong.

QUESTIONS THAT NEED ANSWERS

Every decision taken as a result of planning is one in which alternative courses of action have been weighed in the context of very tangible constraints in manpower, money, and time. Decisions often called "political" in a derogatory sense are really responses to societal values and goals. Because it considers all sectors as parts of a total system, the planning approach implies a series of deceptively simple questions that need direct answers. They will be illustrated in a practical fashion by data collected through population survey and resource statistics in the International Collaborative Study, but these are by no means the only ways in which data can be provided for decision-making.

How to answer the relevant questions depends upon the methods used by the technical staff. Distinctions between styles and stages of the planning process have been the subject of several volumes in the WHO Public Health Papers series.\(^1\),\(^2\),\(^3\). Because there is no general agreement either on the terminology or on the process, it seems better here to describe a very simple approach that can provide the policy-maker with a framework for seeking answers that can set planning in motion. The technical staff supporting the policy-maker should have more sophisticated skills to provide the answers to the following basic questions.

What is the population's need?

The population's need for improved health can be assessed in different ways. As a guide to some relevant concepts and their indicators, policy-makers and planners should examine the model of health, illness, and use of health services that has guided the International Collaborative Study. Essentially, this model asks individuals,

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\(^1\) HEILBRON, H.E., RAKEHUS, A. & THOMAS, W.C. Approaches to national health planning, Geneva, World Health Organization, 1972 (Public Health Papers, No. 46).


\(^3\) Modern management methods and the organization of health services, Geneva, World Health Organization, 1974 (Public Health Papers, No. 55).
whether patients or potential patients or not, to describe their health and health care needs as they perceive them.

As shown in Fig. 2, man’s psychobiological system equips him to perceive and interpret information from internal and external sources and to employ this information in decision-making and in the regulation of his behaviour. He has the capacity to receive and communicate information, such as symptoms, from the psychobiological system; to compare it with information received from the exterior and with information stored in his memory; and to detect possible imbalances. The model covers the individual’s connexions with his family, the neighbourhood, and the community generally and postulates the existence of social interactions that influence his well-being and health and his use of the health services.

An individual’s perception of internal or external disturbances gives rise to the distress and discomfort that provide the stimulus for intervention by society to correct dysfunction. The recognition of disorders constitutes perceived morbidity, which initiates the internal tension that in turn leads to behaviour aimed at diminishing the tension. The major processes involved in maintaining health, coping
with illness, and seeking health care are, therefore, to be seen as essentially adaptive and regulatory, the corresponding behaviour being either in terms of the individual's psychobiological system and directed towards seeking treatment or in terms of altering the system of social interactions and compensatory change, or some combination of the two. The existence and organization of a health care system can themselves influence both the individual's perception of need and his use of the system.

This simple model lends itself to many applications in planning for health. It suggests that illness can be described in terms of three concepts: the traditional medical model, a social interaction model, and a model based on individual and collective perceptions of ill health. The expression of these depends both on the kind of disturbance in the system and on the means by which it manifests itself. Each of these three concepts of illness can be assessed operationally and stated as an indicator of dysfunction or morbidity. The selection of the specific concept of ill health and, correspondingly, of its indicators should depend on the purpose for which the information is needed, and none should be considered generally more valid than another; all should be taken into account in planning a health information system. For the purposes of the International Collaborative Study, perceived morbidity and the related perceived need for the health care of the population were regarded as the appropriate type of information about ill health to be used in an analysis of the use of health services in relation to morbidity.

*Are health needs related to the performance of sectors other than health?*

Since ultimately the investment in health care should be reflected in the improved capacity of a country to achieve its specific national goals, health policy-making involves weighing the effects of more than one sector. The kinds of information needed include data on social and physical functioning (e.g., time lost from productive work or the need for household help) and on factors associated with geographic location. Usually, this type of information is both qualitative and quantitative, and the precise assessment of the effects of other sectors is made in the context of overall social planning and policies in relation, for example, to agricultural development or industrialization.

The decision-maker also needs indicators reflecting the social, cultural, and economic setting in which people live. These include measures of educational achievement, exercise and recreation, nutri-
tion, transport and communications, housing, delinquency, criminality and the working of the judicial system, productivity, consumption, and economic welfare. It is this information, considered along with the values and aspirations of the community and its resources, that will help the policy-maker decide what emphasis is to be placed on the health sector.

*Is there an efficacious solution to the need?*

A policy-maker should confine the allocation of scarce resources to meeting those needs for which an efficacious form of intervention is possible (i.e., one that has been shown to be beneficial by scientific means and will, if applied, improve the health and well-being of the population). He should not merely rely on crude lists of mortality rates or surveys of disease in the population (often euphemistically called “health surveys”). An efficacious intervention is not only the one that “cures” disease; clearly a preventive measure is the wisest choice. Such an approach would be based on an understanding of the fundamental biological or disease process involved.

The evidence that there is an effectual solution to a problem comes from the use of randomized controlled trials and quasi-experimental studies that provide objective measures of the relative benefits and risks of old and new forms of preventive, diagnostic, therapeutic, and restorative procedures, treatments, drugs, reagents, and devices. A problem for which there is no demonstrated solution normally requires more research in order to find a solution; but not all countries can afford this type of social investment, nor is it necessary for each country to duplicate all the research conducted in others. What is needed for decision-making and planning is access to the results of research in libraries, the publication of bibliographies, and dissemination of the findings internationally.

*Does the solution meet other needs?*

Policy-makers are bound to be attracted by an investment in one sector that affects other sectors favourably. The relationships between health and social productivity or regional disparities in health expenditure and employment are examples of ways in which solutions to problems in one sector can be evaluated at the regional or national level in terms of other sectors. The consideration of and decision-making in multisectoral cost-benefit issues require a multisectoral intelligence system. The unit of observation
common to all sectors is the individual citizen, as user of the various social systems, producer or consumer in the various sectors, and participant in the collective life of the community. The population survey and the linkage of administrative records are but two of the techniques developed to help those advising on policy to find solutions that may satisfy many needs. In the International Collaborative Study, the household survey was used in an attempt to provide planners in a number of areas with this background; information was collected not only about the perceived availability of health and medical resources but also about social functioning, such as the days individuals were in bed or restricted in activity because of illness. The personal or financial cost of illness can in this way be assessed in terms of employment, social productivity, or well-being.

In which sector lies the solution?

In choosing among alternatives for the development of health services decision-makers must take into account the fundamental values of society. This becomes evident when the consequences to health of decisions made in fields of policy outside the health care system are considered. In present health policy planning, and especially in health care policy planning, hardly any consideration has been given to the fact that such planning ranges widely over the whole field of public policy and that indeed health policy decisions are necessarily general political decisions. In this connexion, it is important to recognize that the health care system is merely one component of an overall system that must reconcile needs, demands, and supply in a variety of sectors through decisions based on the social, political, and economic values that prevail in a society.

Although a case is sometimes made for the view that health problems are best resolved by the health care sector, careful study of the decline in death rates has repeatedly demonstrated that social and economic progress, e.g., in nutrition or standards of living, has achieved more in the long run than have in general medical technology and health care systems. Epidemiological evidence on accidents, for example, could be used to create a policy establishing emergency medical care with specialized personnel and elaborate electronic communication networks. However, a successful reduction of accident mortality should be sought by a preventive approach in other sectors, such as transport, education, or law enforcement. The issue is one of the appropriateness of the solution to the need and its political feasibility within the value system of society.
Much information already exists about measures of the quality of air, water, and soil, of radiation, noise, exposure to toxic substances, additives, and occupational hazards. Changes can be achieved here through regulation and general education. Health goals

"...should be built into and realized through policies in such other fields as rural water supplies, amounts and kinds of agricultural production, food distribution systems, education, etc., as well as through direct health services; and health programmes in turn should serve to help raise productivity of low-income producers, open up areas for more intensive settlement and exploitation, and provide a more suitable human environment for development in general."

But there must also be mechanisms whereby such fundamental human needs are met as those embodied in elementary but essential questions like: "Where can I go for the relief of pain and suffering?" and "What can I do to live a healthy life?".

Is there a target population?

Although social policy often appears to emphasize equity, the constraints of time and money usually result in the allocation of resources on the basis of the greatest demand. In epidemiological terms this means the identification of the populations at greatest risk of illness by such simple criteria as age, sex, occupation, geographic location, and income level. Total death or sickness rates obscure the need for focusing health care upon special target groups. In the International Collaborative Study several target groups were identified and studied by examining the perception of need for care (associated with the level of severity of the illness, its chronicity and related disability) by age and sex, but other groupings, such as of nomads, residents in remote rural areas, or urban slum dwellers, may be used to define such target groups. The International Collaborative Study did not use a particularly refined way of defining its population base. Separating it into children, productive adults, and the elderly and into urban and rural study areas none the less provided a useful way of describing and comparing relative priorities within and among study areas.

Target populations can also be defined in functional terms, i.e., attributes may be expressed as rates per 1000 population to describe

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the prevalence of the disabled, the chronically ill, and the "anxious", of those desiring to make contact with the health care system, or of those with symptoms associated with specific diseases resulting in high morbidity and mortality. For such measures, the basic data must be obtained from population samples. The International Collaborative Study shows that this need not require a physical examination and laboratory tests; much useful information can be derived from the perceptions and experiences of respondents in a survey.

What are the options for substitution?

Health care requires a substantial investment of human effort and of capital; a well-expressed population need, even if limited to a target population and translated into a policy of action within the health sector, could be met by various combinations of available resources. What mixture of primary health care workers, nurses, pharmacists, infirmary beds, and hospital beds should be used? Can substitutions be made between these? Should a developing country as a rule use expensive resources such as hospitals or physicians to obtain and maintain the population's health, to the possible neglect of agricultural production? Should a society provide medical care for diseases believed to be associated with destructive behaviour or with life-styles that are inimical to health? Answers to these questions can be given in terms of the effectiveness and efficiency of various combinations of social and health services and resources in relationship to the values and aspirations of each society.

What resources are available?

Data on manpower and resources are frequently lacking unless a country has developed a reporting system. However, the existence of such a system does not by itself ensure the reliability of the measures employed or the validity of counts, because of the variety of functions and activities for which resources may be used. While censuses and regular licensure would appear to provide the basic data for planning, the population survey as used in the International Collaborative Study can be used to collect information on the officially unrecorded resources provided by informal health care systems (e.g., unregistered practitioners, healers, and persons trained to give injections) as well. It also provides information on the population's perception of the accessibility of resources. The information obtained on manpower and resources may lead to a consider-
ation of three possible strategies: the production of more resources, the redeployment or even reduction of existing resources, and the dissemination of information about a more appropriate use of available resources.

Human and physical resources also possess a structural distribution; they are organized, coordinated, and integrated through informal and formal links. While it proved difficult in the International Collaborative Study, which covered 12 areas in 7 countries, to define these in terms of a coherent organizational theory, this should be less difficult within a single area or country.

An adequate information system, therefore, requires some measure, even if rudimentary, of the functional, geographic, structural, and perceived distribution of an area’s or country’s resources.

What is the potential for resource development?

More, or different, resources may be required to meet an established need satisfactorily. The cost of providing such resources in manpower, capital, and time should be included in policy and development plans, particularly in developing countries. Data are needed on such matters as students, attrition rates, the length of training, the size of the applicant pool, the length of time spent in the labour force, the career expectations of health care workers, and the determinants of career or specialization choices, all of which may affect development. Similarly, in the development of facilities, the building, medical supply, and pharmaceutical industries all limit the flexibility of a country’s health care plans and may impose structural impediments that are both expensive and counterproductive.

Throughout the various steps of planning an estimate, even if crude, must be reached both of the potential for the development of resources and of the time for the execution of plans. Information and intelligence systems must provide the data required for this purpose.

What is the projected cost?

Planning requires some estimate of the cost of each option presented. Emphasis on monetary factors can be misleading, since money is merely an inadequate reflection of human and social investment and the expenditure of energy. The cost of action in monetary terms must be weighed against the cost of deferred action measured in the less tangible terms of human suffering or societal pressure. The principal advantage of cost-benefit analysis of a number of options is that it encourages a more rational selection, not only of specific
options within the health sector but also of the competing requirements for funds of various sectors. Planners in every country are required to provide precisely this type of cost-benefit assessment for politicians, ministers, or heads of departments, i.e., the decision-makers, when budgets are being prepared for the different sectors. Decisions about health budgets are more likely than not to be improved by usable information accompanied by cost-benefit analyses.

*How well is the programme operating?*

Once a programme has been set in operation, an information system is required for the evaluation of how well it has been executed. The practical questions needing an answer in an evaluation programme are exceedingly simple:

- What are the aims of the programme or programmes in question?
- How many people, and of what kinds, are potentially eligible for help from the programmes?
- What proportion of these people actually get help?
- What kinds of people are they, and who fails to get help?
- What determines who gets this help and who does not?
- Does the service do any good or make any discernible difference? To whom?
- What does the service cost? How do these costs compare with those of potential substitutes?
- Who pays?
- What does the public—those served, those eligible but not served, and those ineligible—think about the service?
- What impact might the service make on the demand for and the effectiveness of other services?

To answer these questions one must study both the use and the non-use of the health services. In countries where there is full insurance or social security coverage of the population, the forms and records completed as a by-product of administration will contain some of the answers; for others a population survey is required, especially if measures of non-use of and of satisfaction with the services are to be collected, the compliance of the population is to be measured, or the effectiveness of the services is to be assessed.

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Evaluation is concerned with assessing the results of increasing or diminishing the resources or altering their distribution, and changes in personal attitudes, expectations, and perceptions must therefore be measured and taken into account. For such evaluation a population survey is indispensable.

Has the need changed since the introduction of the plan?

If the need has been met (especially by preventive action), should the policy-maker not make adjustments so as to mobilize scarce resources to meet other needs? The shift in health care from primary prevention by immunization to various forms of care for special target groups in some of the 7 countries represented in the International Collaborative Study constitutes a deliberate response the policy-makers in those countries have made to a changed need. The success of medical intervention should not lead to investment in more medical techniques without proper consideration of their relative effectiveness and efficiency. Evaluation must concentrate not merely upon the quality of processes; it must also examine outcomes, not only to determine the adequacy of the services but also to assess changes in need. This was schematically described in Fig. 1. The International Collaborative Study considered levels of health and perceived morbidity to be inputs (in terms of needs) into the health care system rather than outcomes. They might also have been considered as outcomes, since planning implies a feedback mechanism; the outcome of one policy becomes, after evaluation, the input into another.
CHAPTER 3

MAIN ASPECTS OF THE WHO/INTERNATIONAL COLLABORATIVE STUDY OF MEDICAL CARE UTILIZATION

International comparisons of health care have tended to cover countries rather than regions or local areas and to be descriptive rather than quantitative in presentation, ideological rather than conceptual in orientation. National comparisons, however, tend to obscure important local variations, and local rather than national decision-making is now regarded as essential for promoting judicious resource allocation and the appropriate use of services; therefore, relatively small geopolitical areas and populations also should be compared within and between countries. In all systems of health care the fundamental concept of need as perceived and expressed by the people has increasingly become the point of departure for allocating resources and evaluating the services provided. Not all perceived needs for health care can be or should be met by organized services; self-care still has much to commend it as a realistic approach when community resources are scarce. It is the main task of those responsible for planning health services to make them as rational as possible and to encourage their utilization in an appropriate way.

Population-based data (derived directly from the people themselves) should be distinguished from institution-based data (derived from places where services are given), since the latter cover only those people who use them. The limited utility of the collection and, more recently, the sophisticated mathematical manipulation, of such traditional institution-based data may be contrasted with the practical

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utility of population-based data in local and national planning. The task of health information systems is to improve the capacity for decision-making so that health needs, the available resources, and the use of services can be brought into equilibrium. If the perceived needs of people are to be met by effective services, some essential "data" related to those needs have to be transformed into summary statistics or "information". When placed in a broader context, this information can become knowledge or "intelligence" that can guide policy-makers, decision-makers, and planners. For them it is important to know which groups get what in the way of health services, where, from whom, and with what benefit, and also to know which groups get nothing or less than they need. Timely information about important health problems affecting populations should be capable of transformation into such intelligence, when combined with an assessment of the many societal and political values and aspirations of the communities or areas concerned, which are not easily expressed in quantitative terms.

In addition, it is essential to expand the domain of social arithmetic (e.g., the measurement of health status and of social well-being) to include the politics of health care (e.g., decision-making with respect to priorities and resource allocation). The mounting costs of services can no longer remain unrelated to measures of need and use. Need and use should be measured both by the number of persons using services and the volume of services used by them, since substantial differences are known to occur between these two measures; it is persons helped that count, not visits to physicians or days spent in hospitals. An essential prerequisite is uniformity of terms, definitions, and classification schemes at both the national and the international levels.

BACKGROUND OF THE INTERNATIONAL COLLABORATIVE STUDY

In all of the study areas and countries participating in the International Collaborative Study there was, even at the time of the feasibility study in 1964, a growing recognition that health information systems required radical rethinking if the information applied in planning, managing, and evaluating health services was to be useful. There was also the recognition that new concepts and theories about health and disease and about the form and structure of health care systems were essential if health services were to be moulded along more

rational lines. Governments and their advisers in all 12 study areas and all 7 countries involved in the study were looking for new approaches to the allocation of resources and the organization of services to meet the needs perceived by populations.

It was the conviction of the participants in the International Collaborative Study that they could learn from each other and collectively contribute to the development of new conceptual models and new methods of analysing their own national and local problems. In this way it was possible that they could contribute to the solution of problems that were perceived to be of growing importance throughout the world. This was the reason why WHO joined and supported the International Collaborative Study of Medical Care Utilization at its inception in 1964. The overall objective of the study—a population-based epidemiological and social survey of the perceived needs of populations, of resources, and of the utilization of health services—was to look into differences between areas in various countries in order to answer three broad questions:

- To what extent are differences in the organization of health care and its resources reflected in differences in the use of health services?
- What behavioural and social factors influence patterns of use in different regions?
- What methodological problems must be overcome before valid statements can be made regarding patterns of use in different regions?

An aim of the study was to improve understanding and communications among those concerned with the provision of health care to populations—the policy-makers, planners, and administrators in governmental and other health organizations on the one hand, and investigators and students of health services in universities and research institutions on the other. It was hoped to raise the level of empirical research on health services and to improve both the prerequisites and the capacity for decision-making and resource allocation. Although realizing that the organization of health services is governed predominantly by local or national traditions (whether those of the community or those of health professionals), the investigators wished to encourage the collection and use of information permitting objective comparisons over time and space.

It was believed that, with an expanded body of theory and methods from which new concepts and types of information could be derived, health services as social services should be able to answer better the needs of the people. In addition, there was the prospect that the findings of such a study might contribute to epidemiological and
social science theory. While the findings were of interest, the methods and concepts were considered to be of equal importance and utility, particularly to the extent that they were supported by the data; both illustrate the value of new types of information for planning.

The study began with the assumption that most formal health care systems have a common scientific basis. Differences in this respect among the participating study areas and countries were presumed to be small compared with the differences in the resources allocated for health services, in the combinations of personnel and facilities provided, and in the organizational arrangements. It was considered unlikely that there is an ideal or even a best way of organizing health services or of arranging a health care system. However, it was thought instructive to identify and compare needs, resources, and use in order to improve the process of choosing among alternative ways of decision-making and resource allocation. It was the function of relating these three elements (needs, resources, and use) that was subsumed under the term "planning and management". The participants in the study have left for future investigators the important task of linking these elements to outcomes of care and to improvements in the health status of the population.

ORGANIZATION AND METHODS OF THE STUDY

The International Collaborative Study represents a decade of effort that involved 12 study areas in 7 countries: 4 in Canada, 2 each in the USA and Yugoslavia, and 1 each in Argentina, Finland, Poland, and the United Kingdom. The study compared the use of health services and its determinants in these 12 different areas, an aggregate sample of almost 50,000 non-institutionalized persons being taken of the population of more than 15 million people. Because each study group participated for its own reasons, the 12 study areas were not intended to be representative of their respective countries or regions. Moreover, changes have occurred in most of the study areas since the field work was conducted (1968-69), and the findings may not in all instances be indicative of the present situation.

The primary source of data was a series of 4 consecutive quarterly household surveys, conducted in 1968-69, of the civilian population not residing in institutions in the 12 study areas. The overall individual response rate achieved was unusually high at 96.6%, with a range among the study areas of from 90% to 99%. In addition, data were gathered independently for the period in which the field
work was conducted on population composition, health care resources, personnel, and facilities (statistical adjustments being made for the import of services into and export from the study areas), and health services organization. Identical methods were used throughout, including methods for ensuring the comparability of the household questionnaires, which were translated into and retranslated from the four study languages other than English, i.e., Finnish, Polish, Serbo-Croatian, and Spanish.¹

A set of 9 procedural manuals¹ guided the work, all the supervisors were trained centrally, field workers were instructed by identical methods, and the study areas were visited by consultants. While cross-national data processing and analysis were largely centralized in Baltimore, the interpretation and presentation of the findings were shared by participants from all the study areas. A coordinating committee guided the study, and there was an explicit set of collective understandings and arrangements for decision-making and task assignment among the 90 professionals and 300 technical personnel involved. In all, some 24 international working conferences or meetings were held, and an extensive system of minutes and memoranda and a newsletter kept all the groups informed about problems and progress. A decade of collaboration and dialogue was an unusual educational experience for all the participants,² and most are persuaded that their own growth in attainments has enabled them to communicate many of the concepts that evolved to colleagues responsible for planning and managing health services.

The main results from most of the study areas were available for local and national use 2 years after completion of the field work.³ To a considerable extent, the findings of the study, particularly the local and national findings, have already been the subject of public discussion, and they have been incorporated in governmental position papers, policies, and administrative changes in several of the participating countries. A number of other countries and communities have used or plan to use the methods employed for the conduct of surveys or the development of health information systems. Although the international comparisons have taken a substantial time to complete, it was heartening to the participants to see the results used

¹ The English version of the household questionnaires and other survey documents and the translations of their first pages are shown in Appendix C of Kohn & Wurtm, op. cit.
² Lists of the study publications (including the procedural manuals) and of the repositories where the complete or reduced archive tapes of the International Collaborative Study and supplementary documentation are available are given in Appendices E and F.
locally and nationally so promptly after completion of the field work; this emphasized the practical implications of their concepts and methods.

THE STUDY MODEL OF HEALTH SERVICES USE

Some aspects of the theoretical model of the study, especially those related to perceived need and its significance in understanding the use of health services, have been discussed in Chapter 2. In addition, attention was also paid in the study to the so-called predisposing and enabling factors at the individual level. In accordance with the theoretical model, perceived need is the major prerequisite in generating demand for health care. It is at this point that both predisposing and enabling factors exercise their influence. The predisposing factors are mainly the individual's knowledge of and attitudes towards health, illness, and health services, and they are culture-linked. The enabling factors are mainly the availability of health services to the individual and the possibility he has of purchasing them, since they will involve, for example, opportunity costs (time lost from work, travel time, and opportunities foregone) as well as actual or out-of-pocket costs. Also involved is the individual's understanding about the availability of services and of insurance benefits or legal entitlements.

The analysis in the study of use and its determinants, among them the various predisposing and enabling factors, stressed the population point of view; the basic model employed is depicted in Fig. 3. The aim was to describe the structure and resources of health care systems by an analysis of those who do or do not use health services in relationship to their perceived needs.

The perception of morbidity as the source of perceived need for care involves the concept of "sickness behaviour", the seeking of care by an individual being motivated by a recognition that something is wrong with his health and the belief that relief is possible. Of course, not all contacts with a health care system are motivated by a perceived disorder; preventive and diagnostic services are often approached by individuals in the absence of illness to determine the state of their health. In the context of the study model, such "health behaviour" is viewed as an information-seeking process initiated by the consumer to maintain health or prevent disease or by the social system for administrative reasons that have similar or related purposes.

The individual may be fully aware of the costs and benefits of the health services, but he may prefer to do something else rather than contact a physician or other health worker. In such cases the
non-use of services may lead to informal health care arrangements, or to the use of home remedies including self-medication with traditional medicines, or to the adoption of “will power”, “faith”, or “wait-and-see” attitudes. It is possible that for most people most of the time these may be the most popular or the most accessible methods of dealing with the majority of perceived needs. On the other hand, the structure of medical care may also lead to undue reliance and unreasonable demands on the health care system instead of encouraging the use of simple coping measures.¹

**FIG. 3. MODEL USED BY THE INTERNATIONAL COLLABORATIVE STUDY IN ANALYSIS OF THE USE OF HEALTH SERVICES**

For those without access to, but with a demand for, formal health services, however, the supply and distribution of resources become critical factors. The availability, balance, and structure of resources (personnel, facilities, organization, and financing) can be so altered by the health authorities as to respond to such a demand. Usually, because of its nature and volume, the demand is greater than the supply and arrangement of resources can satisfy. As a result, there is a residual population group with an unmet demand. This makes the use of health services of critical importance in social planning as a whole. The entire supply side of the health care model may be seen as a subsystem involving health-oriented resources, in the context of other subsystems pursuing the same objectives but using other than health resources.

FIG. 4. ANALYSIS OF STAGES IN THE HEALTH CARE PROCESS

APPLYING THE MODEL IN THE ANALYSIS OF DATA

The theoretical model of the study related to the use of health services, as shown in Fig. 2 and 3, was applied in the analysis and interpretation of the data on the use of health services within each study area. Its application is further illustrated in Fig. 4, which shows the health care process as a series of interrelated stages. The probabilities $P_1$ to $P_6$, reflecting the moving of an individual from one stage to another, are influenced by several sets of factors: perceived need for care, predisposing and enabling factors, systems factors, as well as professional and administrative factors operating inside the health services system.

The process begins with an individual's perception of "disorder". If this perception and the factors interacting with it, e.g., the perceived availability of care or the level of his scepticism about the value of medicine, result in a decision to seek care from the health services system ($P_2$), then, depending upon the availability and the accessibility of the services, an individual may elect either not to use the health services (with a probability $P_3$) or to use them ($P_5$). Interaction between the individual and the health professionals will determine
whether there will be additional or derived use of services and the mixtures of services that will be employed in treatment (P₁, or P₂).

In the International Collaborative Study, the analysis and interpretation of the data were based on these relationships; information was collected corresponding to the model and compared among population groups within the study areas as well as from area to area. In this way, the factors affecting the probabilities could be assessed. Some information about these analyses will now be given, to illustrate the possibility of applying the approach made in the study to the analysis of health services systems in different countries.
CHAPTER 4

APPROACH TO THE ASSESSMENT
OF HEALTH CARE SYSTEMS
AND THE USE OF HEALTH SERVICES

PRESENTATION OF DATA

The results of the International Collaborative Study summarized here are restricted to the major findings bearing on medical care, with a few of the findings on dental care, use of medicines, vision services, and the use of selected non-physician health care personnel.¹

The study areas are identified by symbols (Table 1) on all the tables and figures, and the median rates and ratios for all the 12 study areas are identified by the symbol M. For the most part, only the total rates are given for events per 1000 population standardized for age and sex.² The standard errors of the standardized rates are provided for those interested in examining the statistical differences among study areas, but the investigators consider the replication of patterns and trends to be more important. Substantial errors no doubt remain, and readers may not agree with the concepts, indicators, and categories employed; but the claim of the investigators is rather one of objectivity and reliability, both in the application of the methods throughout the study areas and in the effort to reduce errors as much as possible.

In the present context, the statistical precision of the study is of less importance than are the opportunities it affords of drawing conclusions, asking questions, and arousing discussion by the display

¹ See footnote on page 29.
² In standardization an adjustment is made for differences among the study areas in the proportion of persons of different age and sex; the standardized rates, therefore, take account of these differences.
<table>
<thead>
<tr>
<th>Country</th>
<th>Study area</th>
<th>Symbol</th>
<th>Total population* No.</th>
<th>Surface area km²</th>
<th>Population density pop./km²</th>
<th>% urban</th>
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<td>448 300</td>
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**Median**

<table>
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<tr>
<th>M</th>
<th>565 130</th>
<th>3 304</th>
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<th>60.5</th>
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</table>

**Range**

| 11 100 | 7 868 300 | 259 15 026 | 4 205 1 | 15-100 |

* Based on census nearest to 1967-1968.
of patterns and trends among the many indicators of perceived morbidity, resources, and use, particularly the extremes. Indeed, it is these that frequently provide the greatest insights and indicate ways and means of guiding the planning of health care systems. No claim is intended or implied that the differences observed are absolute or even typical.

ASSESSMENT OF NEED

Before examining variations in resources and in their use, it is important to determine whether gross differences exist in the major indicators of health when the effects of different age and sex structures of the study area populations are removed. The geographic and demographic characteristics of the 12 study areas are summarized in Table 1. Five were large metropolitan areas (Baltimore, Buenos Aires, Liverpool, Helsinki, and Lodz), 4 were predominantly rural (Banat, Fraser, Grande Prairie, and Jersey), and 3 were mixed urban and rural (the Saskatchewan study area, Northwestern Vermont, and Rijeka). In general, the health status of these 12 populations did not differ greatly as judged by traditional mortality indicators (Table 2). Mortality rates standardized by age and sex have a narrow range (6.9 to 9.2 deaths per 1000 population about the median of 8.4); so does proportional mortality, i.e., the percentage of deaths

<table>
<thead>
<tr>
<th>Study area</th>
<th>Standardized mortality Rate/1000</th>
<th>Infant mortality Rate/1000</th>
<th>Proportional mortality %</th>
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<td>78.0*</td>
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<td>80.5*</td>
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<td>8.3</td>
<td>20.8</td>
<td>88.7</td>
</tr>
<tr>
<td>Helsinki</td>
<td>8.2</td>
<td>15.8</td>
<td>82.6</td>
</tr>
<tr>
<td>Lodz</td>
<td>7.9</td>
<td>44.7</td>
<td>81.3</td>
</tr>
<tr>
<td>Banat</td>
<td>9.1</td>
<td>47.1</td>
<td>84.1</td>
</tr>
<tr>
<td>Rijeka</td>
<td>7.5</td>
<td>19.2</td>
<td>89.4</td>
</tr>
</tbody>
</table>

Median | 8.4 | 24.5 | 82.0
Range  | 6.9-9.2 | 15.8-47.1 | 74.2-98.7

Data base: study areas, except * based on regional data.
of persons aged 50 years and over in relation to total deaths (range: 74.2 to 88.7 % about the median of 82.0 %). Only infant mortality rates (i.e., deaths of children under one year per 1000 livebirths) show a wider range (15.8 to 47.1 per 1000 livebirths about the median of 24.5); in this case 3 study areas have substantially higher rates than the other 9. In a sense, these rates may be regarded as outcomes of prior activities of the existing health care systems in the study areas; but they are used here to indicate the overall similarity of health status across study areas.

Of perhaps greater interest than these traditional indicators is the consistency among the study areas in the total standardized rates for those who were considered as “healthy” or “functionally healthy” (Fig. 5) in the study.1 There was a fairly narrow range of 120 to 164 per 1000 population for the “healthy” (largely children and young adults); the median rate of 143, in conjunction with the rates for the “functionally healthy”, which ranged about a median of 244, suggests that about 4 out of 10 persons were not, according to the indicators used, impaired in health just prior to or at the time of interview. It could be argued that the constancy of this measure over 12 such varied study areas does not support the widely held view that the demand for medical care arises from a bottomless pit of perceived need. There appear to be limits to the potential demand in each of these populations, at least when this is measured by the number of respondents who do not report health problems in an interview.

More variation is observed when the impairment among the approximately 6 out of 10 who were not considered “healthy” or “functionally healthy” is compared. One of its measures is sick days, i.e., days in bed and/or days of restricted activity within the 2-week recall period (Fig. 6). The total standardized rates for persons with sick days had a range from a low of 153 per 1000 population in Grande Prairie to a high of 280 in Lodz, about a median of 184. The rates for the volume of sick days, i.e., the total number of sick days for all persons with one or more, showed the same pattern but even greater variability; the range is more than twofold, from a low of 634 sick days per 1000 population, again in Grande Prairie, to a high, also in Lodz, of 1650, the median being 845. Notably higher

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1 Individuals were defined as “healthy” if they failed to report, at the time of interview or for a specified recall period preceding it, any of the following indicators of ill health: social dysfunction (bed days and/or days of restricted activity), perceived morbidity (illness or a chronic impairment that the respondent acknowledged during an interview), symptoms of specific psychologi-cal dysfunction (as defined by frequently used epidemiological questionnaires), or a perceived dental or vision problem. The “functionally healthy” included those who, while not reporting days in bed or of restricted activity, responded affirmatively to one or more of the questions concerning the presence of chronic conditions that were not disabling, and/or concerning the lowest levels of symptoms for one or more of the 5 indicators of psychobiological dysfunction, and/or perceived dental or vision problems.
FIG. 6. SOCIAL DYSFUNCTION WITHIN 2 WEEKS — TOTAL STANDARDIZED RATES AND STANDARD ERRORS PER 1000 POPULATION.

VOLUME OF SICK DAYS

PEOPLE WITH SICK DAYS

RATE/1000
rates were observed in Buenos Aires and the 4 continental European study areas than in the 6 North American study areas and Liverpool. Among the reasons may be differences in the cultural manifestations of sickness (the so-called “sick role”), rather than differences in what may or may not have been clinically defined morbidity.

A somewhat different but overlapping measure of the potential pressure on a health care system is the presence in the population of “chronicity with disability”, defined as a physical impairment or handicap and/or a long-standing health problem or chronic illness with some degree of resultant disability or loss of functional ability. This measure is shown as age-sex standardized rates per 1000 population in Fig. 7. Here the variation is indeed considerable; there is a fourfold range (77 to 304) about a median of 95 per 1000 population. The rates were relatively low and consistent in all but the 4 continental European study areas, where perhaps they reflected the direct exposure to the ravages of two world wars.

FIG. 7. PERSONS WITH CHRONICITY WITH DISABILITY — TOTAL STANDARDIZED RATES AND STANDARD ERRORS PER 1000 POPULATION

![Chart showing rates per 1000 population across different study areas.](chart.png)
The traditional way of measuring health care manpower is through crude head counts of physicians, nurses, and other skilled personnel. Although recognized as insufficient for health planning, this still represents the necessary starting-point and the most reliable index available at present.

Apart from the almost threefold variation among the 12 study areas in the overall ratios per 10,000 population of total physicians and of physicians in clinical practice (Fig. 8), there were wide ranges for the 4 physician subcategories shown. The range of general practitioners was almost sevenfold, from 1.4 per 10,000 population in Northwestern Vermont to 10.1 per 10,000 in Fraser, with 5 study areas close to the median (4.3). The range for specialists was even wider, more than thirtyfold, with 0.4 specialists per 10,000 population reported for Grande Prairie and 15.2 for Buenos Aires. The ratio of total physicians to those in clinical practice was highest in study areas that were sites of university medical centres. Buenos Aires was an exception to this pattern, which is also reflected in Fig. 8, where the ratios of physicians in training and in teaching, research, and administration are in general higher for those study areas that were the location of university medical centres.

The striking difference in the proportion of general practitioners to specialists is illustrated in Fig. 9, the former being predominant in the 3 rural Canadian study areas (Grande Prairie, Fraser, and Jersey) and, to a lesser extent, in the Saskatchewan study area, Liverpool, and Banat. This distribution may have something to do with the degree of urbanization, the location of university medical centres or, more likely, the overall organization of medical practice. It must be borne in mind that, especially in the 6 North American study areas, certain specialists like internists and paediatricians function largely as general or primary care practitioners.

Similarly, there was wide, about fivefold, variation in the supply of nursing personnel (Fig. 10); it remained wide even after the exclusion of nurses in training, who may also have been involved in providing services. If many of the nursing tasks traditionally performed by nurses can also be performed by assistant nurses or other nursing personnel, the data should reflect a hierarchy of skills, with the nurse leading a team of assistant nurses; but the data do not indicate that such a structure of nursing services actually existed in any of the study areas. It should be recognized, however, that nursing is in a state of transition; nurses are being relieved of less
professionally demanding tasks by assistant nurses, auxiliaries, and other health workers and are assuming a number of tasks traditionally reserved to the physician.

For the health services manager, the traditional capital resource unit is the hospital bed, the focus of most of his budget expenditure. Since the study population excluded people in hospital at the time of interview, the study could only provide a relatively static picture that fails to reflect much of the impact of chronic disease requiring long-term hospitalization. However, this limitation does not affect the data on the availability of resources in terms of total hospital beds which, as Fig. 11 shows, varied about threefold. There were, no doubt, differences among the study areas in the meaning of the term "long-term bed" and in the use of such beds.

FIG. 9. RATIOS OF GENERAL PRACTITIONERS TO SPECIALISTS

![Ratios of General Practitioners to Specialists](image-url)
CLASSIFICATION OF HEALTH CARE SYSTEMS

Health planning within a country requires some description putting the health system in its sociopolitical context. It is on the basis of values peculiar to a specific country or even region or area that planners and administrators assign priorities and allocate resources. The International Collaborative Study explored a number of pertinent concepts, such as the role in each health care system of “health as a societal value”, “collectivism versus individualism”, and “distributional responsibility”. To a limited extent it was also possible to examine the relative contribution of the public and private sectors in the provision of health care, particularly as it affected personal liability for health care expenditure.

The first concept, health as a societal value, reflects the extent to which health is a subject of societal concern and receives overall priority in the conscious allocation of total resources. The second, collectivism versus individualism, reflects the emphasis given by society to the overall control of the distribution of health care measures and resources. Distributional responsibility, the third concept, reflects the extent to which decision-making is centralized or decentralized. All three concepts are expressed formally through institutional arrangements and decisions, frequently at the government level, and all reflect social and political mandates of varying strength, impact, and accountability requirements.

It was found that study areas with the highest estimates of societal interest in health were also the study areas with the lowest totals for per capita health expenditure and health expenditure as a percentage of national income.

The systems were also described by composite resource scores, which attempted to take into account the total investment (training and capital) in health care resources as distinct from operating costs.

These concepts clearly need further refinement, and there is a need for new tools of comparative and evaluative research to deal with issues such as the distribution and optimal use of various categories of health manpower, the relationship of the clinical to the managerial profession, and the degree of bureaucratization.

SUMMARY OBSERVATIONS ON USE

In Table 3, the principal measures of use are summarized as total rates standardized for age and sex and standard errors both for persons using health services and for volume of services used. These
### TABLE 3. SUMMARY OF HEALTH SERVICES USE: TOTAL STANDARDIZED RATES AND STANDARD ERRORS PER 1000 POPULATION FOR PERSONS USING SERVICES AND VOLUME OF SERVICES USED

<table>
<thead>
<tr>
<th>STUDY AREAS</th>
<th>Total standardized rate</th>
<th>GP ±SE Rate</th>
<th>SA ±SE Rate</th>
<th>FR ±SE Rate</th>
<th>JE ±SE Rate</th>
<th>NV ±SE Rate</th>
<th>SE ±SE Rate</th>
<th>BA ±SE Rate</th>
<th>LI ±SE Rate</th>
<th>HE ±SE Rate</th>
<th>LO ±SE Rate</th>
<th>BT ±SE Rate</th>
<th>RI ±SE Rate</th>
<th>M ±SE Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons with physician contact*</td>
<td>136 4 152 6 152 5 153 5 158 6 202 7 197 6 179 11 120 5</td>
<td>156 6 167 5 149 7</td>
<td>125</td>
<td>180 8 224 12 220 8 210 9 226 12 305 14 306 13 239 18 158 7 218 10</td>
<td>263 11 234 14</td>
<td>225</td>
<td>156 5 125 6 139 5 150 5 142 6 99 5 65 4 79 8 114 4</td>
<td>101 5 86 4 95 5</td>
<td>108</td>
<td>189 114 1486 130 1608 102 1578 94 1183 87 1228 133 732 84 1148 261 1588 103</td>
<td>2399 191 1473 105 1456 130 1480</td>
<td>1920 17 1046 22 900 15 922 17 1202 26 1047 21 814 19 816 33 948 18 724 24 391 11 424 16</td>
<td>910</td>
<td>273 6 300 8 262 6 269 6 344 9 328 7 304 7 247 12 280 6 184 6 160 5 183 7</td>
</tr>
<tr>
<td>Persons using prescribed medicine*</td>
<td>273 6 300 8 262 6 269 6 344 9 328 7 304 7 247 12 280 6 184 6 160 5 183 7</td>
<td>271</td>
<td>273 6 300 8 262 6 269 6 344 9 328 7 304 7 247 12 280 6 184 6 160 5 183 7</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persons using nonprescribed medicine*</td>
<td>355 7 384 9 369 7 354 7 399 10 327 8 184 6 317 14 295 7 130 5 97 4</td>
<td>101 6 327</td>
<td>80 3 113 6 100 4 85 4 120 6 126 6 108 6 85 6 110 5 121 5 89 4 90 5</td>
<td>103</td>
<td>119 6 151 9 147 7 88 6 177 11 184 11 227 14 107 12 251 12 219 12 172 9 209 16</td>
<td>175</td>
<td>75 3 97 5 76 4 80 4 79 4 70 5 45 3 92 5 109 4 41 3 41 3 42 4</td>
<td>76</td>
<td>75 3 97 5 76 4 80 4 79 4 70 5 45 3 92 5 109 4 41 3 41 3 42 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persons with selected health care personnel contact*</td>
<td>75 3 97 5 76 4 80 4 79 4 70 5 45 3 92 5 109 4 41 3 41 3 42 4</td>
<td>76</td>
<td>75 3 97 5 76 4 80 4 79 4 70 5 45 3 92 5 109 4 41 3 41 3 42 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume of different medicines used*</td>
<td>99 6 141 10 165 8 111 7 129 9 101 8 71 8 125 13 167 9 62 6 93 7 77 9</td>
<td>103</td>
<td>99 6 141 10 165 8 111 7 129 9 101 8 71 8 125 13 167 9 62 6 93 7 77 9</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

NOTE: Numbers in **bold type** denote maximum and minimum rates for each variable.

* Within two weeks. **Within twelve months. ***Within two days. 
* Including birth control pills. **Within one month.
overall measures summarize the major statistical findings of this comparison of the use of health services in 1968-69 in 12 study areas and 7 countries with different health care systems. The following brief comments illustrate the kinds of question such findings can give rise to among policy-makers, planners, and managers. Comparisons and contrasts among local findings obtained as a result of a country's national health plan may well raise similar questions.

**Physician and hospital use**

The rates for persons with physician contacts varied less across the study areas than the volume of such contacts; the latter may have been more responsive to the mixture of different physician categories (e.g., general and specialist physicians) than to the total ratio of physicians to the population. Again, the differences between the rates for persons with contacts and the volume of contacts tended to be smaller within than among countries, suggesting the importance of systems factors, of financing mechanisms, or both. Two-week rates for physician contacts increased generally with respondent age, but the rates for persons with contacts within 12 months varied among the age groups and the study areas. Sex-specific rates generally showed higher rates of physician use among women than among men, except for physical examinations.

The central role of the physician in controlling the extent and nature of the use of his own and other services was particularly marked in respect not only of the volume of physician contacts and of referrals but also of hospital admissions, volume of hospital nights, and use of prescribed medicines. The mixture of different types of physician in clinical practice and of ratios of physicians to hospital beds appeared to be as important a determinant of the volume of hospital nights consumed as the supply of beds. Also, the way in which resources were made available and accessible was probably a more important determinant of the use of services than the absolute ratio of the resources to the population. Rates for persons hospitalized and volume of hospital admissions tended to be higher in the North American study areas, whereas the length of hospital stay tended to be greater and hospital bed turnover rates (the number of discharges per available bed per year) lower in the European study areas and Buenos Aires.

**Use of medicines**

The total volume of medicine use varied widely across the study areas, with variations among countries greater than within countries,
probably influenced by regulatory policies. The volume of prescribed and non-prescribed medicine use and the rates per person were highest by far in the North American study areas.

*Use of dental and vision services*

Dental and vision services appeared to be about equally distributed in relation to perceived need in most study areas.

*Use of other health care personnel*

Some categories of non-physician health personnel with both delegated and independent responsibility in ambulatory care, including nurses, seemed to be deployed differently in the various study areas.

**INFLUENCE OF SOCIAL AND BEHAVIOURAL FACTORS ON USE**

As stated before, the rates for persons with physician contacts were related to the rates of perceived morbidity and, to a lesser degree, to the supply of physicians, and neither these rates nor those for the volume of physician contacts could be explained by physician supply ratios alone. Since both rates tended to vary less within than among countries, the following can be postulated as among the more likely influences on the volume of physician contacts: financing and payment mechanisms, organizational arrangements, the balance between physicians providing ambulatory care and those providing inpatient care, and the relative availability of generalists and specialists. Acute and chronic perceived morbidity were found to be the major determinants of health services use, but the use was also slightly affected by such predisposing factors as perceived availability of care and scepticism about medicine and about physicians. The level of education seemed to exert more influence on the use of dental services than on the use of medical services.

The International Collaborative Study found that behavioural and social factors (which undoubtedly contribute to the genesis of much illness) had a modest predictive effect on the overall patterns of use as compared with the substantial influence of various forms of perceived morbidity. Perceived availability of medical care was a more important influence on the use of physician services by children than on their use by adults, and the identification of a particular physician or particular place for obtaining physician services was an important determinant of physician use. Overall, the association of anxiety

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1 Defined as an affirmative response to 3 or more of 10 questions forming an anxiety index based on the Cornell Medical Index.
### TABLE 4. MEASURES OF PERCEIVED MEDICAL NEED, RESOURCES, AND USE: INDICATORS AND MEDIAN RATES AND RATIOS

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Median rate* or Resource ratio* (12 study areas) (P = persons; V = volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceived Need</strong></td>
<td></td>
</tr>
<tr>
<td>Persons with sick days within two weeks per 1000 population</td>
<td>165 Sickle days (P)</td>
</tr>
<tr>
<td>Volume of sick days within two weeks per 1000 population</td>
<td>543 Sickle days (V)</td>
</tr>
<tr>
<td>Persons with perceived morbidity of high severity within two weeks per 1000 population</td>
<td>42 High severity (P)</td>
</tr>
<tr>
<td>Persons with chronicity with disability per 1000 population</td>
<td>93 Chronic with disabl (P)</td>
</tr>
<tr>
<td>Persons with 14 bed days within two weeks per 1000 population</td>
<td>11 Bedfast 14 days (P)</td>
</tr>
<tr>
<td>Persons with at least one indicator condition per 1000 adults</td>
<td>162 Indicat cond (P)</td>
</tr>
<tr>
<td>Persons reporting anxiety per 1000 adults</td>
<td>134 Anxiety (P)</td>
</tr>
<tr>
<td><strong>Resource and Organization Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Total physicians per 10,000 population</td>
<td>15.1 Total phys</td>
</tr>
<tr>
<td>Physicians in clinical practice per 10,000 population</td>
<td>9.9 Phys clin prac</td>
</tr>
<tr>
<td>Total hospital beds per 10,000 population</td>
<td>10.0 Total beds</td>
</tr>
<tr>
<td>Short term hospital beds per 1000 population</td>
<td>4.9 Short term beds</td>
</tr>
<tr>
<td>Pharmacists per 10,000 population</td>
<td>4.0 Pharm</td>
</tr>
<tr>
<td>Selected health care personnel (delegated responsibility) per 10,000 population</td>
<td>11.1 SHCP</td>
</tr>
<tr>
<td>Percentage of individual liability for personal health care expenditure</td>
<td>18.6 % ind liabl</td>
</tr>
<tr>
<td>Health expenditure as percentage of national income</td>
<td>6.5 Health exp as % nat inc</td>
</tr>
<tr>
<td><strong>Use</strong></td>
<td></td>
</tr>
<tr>
<td>Persons with physician contact within two weeks per 1000 population</td>
<td>155 Phys cont (P)</td>
</tr>
<tr>
<td>Volume of physician contacts within two weeks per 1000 population</td>
<td>224 Phys cont (V)</td>
</tr>
<tr>
<td>Persons with overnight hospital admission within twelve months per 1000 population</td>
<td>110 Hosp adm (P)</td>
</tr>
<tr>
<td>Volume of hospital nights within twelve months per 1000 population</td>
<td>1499 Hosp nights (V)</td>
</tr>
<tr>
<td>Volume of different medicines (including birth control pills) used within two days per 1000 population</td>
<td>861 Total med (V)</td>
</tr>
<tr>
<td>Persons using prescribed medicines within two days per 1000 population</td>
<td>259 Presc med (P)</td>
</tr>
<tr>
<td>Persons using nonprescribed medicines within two days per 1000 population</td>
<td>330 Non presc med (P)</td>
</tr>
<tr>
<td>Persons with selected health care personnel contact within two weeks per 1000 population</td>
<td>77 SHCP cont (P)</td>
</tr>
<tr>
<td>Volume of selected health care personnel contacts per 1000 population</td>
<td>103 SHCP cont (V)</td>
</tr>
</tbody>
</table>

* Median total crude rate. * Median ratio of supply of manpower and facilities.
with the use of medicine by adults was considerable, while with the use of physician services it was moderate. When the effect of anxiety was held constant in statistical analysis, the threshold at which people used medicines appeared to be unrelated to the availability of medicines by prescription only; this was found to a lesser extent for the use of physician services in relation to the ratio of physicians to population. Hospital use was found to be influenced by family type, perhaps reflecting the availability of domestic as opposed to institutional care for the sick.

Overall, however, the attitudinal and behaviourial factors (reflecting the so-called predisposing and enabling factors), which were given considerable attention in the study design, had slight predictive value in contrast to perceived morbidity. It seems possible that this reflects their actual impact and utility. Better variables could undoubtedly be constructed, but experience in the study suggests that, at least in a cross-national study of overall health services use, efforts expended in that direction may not materially increase the predictive yield. This is probably due to the fact that differences among health care systems tend to mask the effect of such individual level variables.

TWELVE CASE STUDIES: PATTERNS OF NEED, RESOURCES, AND USE

To compare the balance between perceived need, resources, and use within and among the study areas, the selected indicators shown in Table 4 were expressed for all the study areas as percentages of the median values of the respective rates and ratios. This set of arrays was designed to suggest patterns and possible alternatives for resource allocation. Clearly, these measures are at best proxies for the underlying concepts and variables, and causal associations are not intended or implied; also many caveats about differences in recall periods and measurements need to be entered. Nevertheless, the 12 sets of summary data taken from the study and shown in Fig. 12-23 should be illustrative. Since these overall comparisons are intended essentially to establish differences at the area level, the measures of perceived need and use are based on total non-standardized (or crude) rates as those most logically related to the resource ratios. Brief comments and questions reflecting the results for each study area will suggest the types of problems and related policy issues that may deserve further consideration and can be examined by means of health services research.

In Grande Prairie (Fig. 12), for example, did the relatively high allocation of short-term beds (149% of the median for all study
areas), in the context of a low allocation of physicians in clinical practice (66% of the median), contribute to the relatively high proportion of persons with hospital admissions but a rather lower consumption of hospital nights, i.e., to short stays? Were short-term hospital admissions used as substitutes for physicians in clinical practice and for the provision of ambulatory care? Were they associated with travel time to sources of care for those in a largely rural Canadian study area? These questions should be considered in the light of relative levels of need that were generally well below the medians defined for all study areas.

In the Saskatchewan study area (Fig. 13) all measures of need, except for 14-day bedfastness, and most measures of the more costly components of use (i.e., physician contacts and hospital nights) were close to the median level. Were then the high allocations of pharmacists and selected health care personnel cost-effective? Did the volume of contacts with selected health care personnel increase the productivity of physicians and hospitals or did it provide a substitute for their use? Was the population less seriously ill, since this study area (together with Buenos Aires) had the lowest level of persons with 14 bed days, or were there alternative forms of institutional care for this group of patients?

Fraser was one of the few study areas that, in terms of the measures used in this study, could be regarded as reasonably balanced with respect to comparative levels of need and use, all being close to the median (Fig. 14). Were Fraser's arrangements the result of market forces and an open system or have they evolved in accordance with some informal plan? Why should Fraser's relatively generous supply of physicians in clinical practice (as compared with the adjacent study area of Jersey) be associated with similar patterns of physician use?

Jersey (Fig. 15), in the face of measures of perceived need that were in all instances below the median rates, had a generous supply of total beds (particularly long-term beds; see Fig. 11). Did this reflect a real need of the population, or was the relationship spurious and associated with a heavy utilization by residents of Jersey of mental hospital beds located outside the study area? Since relative levels of anxiety were similar in Fraser and Jersey, but Jersey had a less generous supply of physicians, it may be asked whether they referred more psychiatric patients because they were busier. Neither the relative ratio of short-term beds nor the volume of hospital nights was notably different from those in the adjacent study area of Fraser.

In the USA, Northwestern Vermont (Fig. 16), a semirural study area not unlike the 4 Canadian ones, had an aggregated level of
anxiety that was the highest among the 6 North American study areas. In conjunction with ratios of physicians in clinical practice and of short-term beds that were close to the medians, did anxiety in the study population contribute to the highest level of total consumption of medicines and of persons using non-prescribed medicines among all study areas? Why was the lowest relative level of hospital nights for any of the six North American study areas found in Northwestern Vermont, and this in the face of the third highest level of persons admitted? Did the latter reflect short-stay hospital admissions for care by specialists and super-specialists or consultants for diagnostic purposes? This study area had the lowest ratio of general practitioners per 10,000 population (see Fig. 8) and, with Baltimore, the lowest ratio of general practitioners to specialists of all 12 study areas (see Fig. 9).

**Baltimore** (Fig. 17), the only metropolitan study area in North America, had a high relative level of persons with perceived morbidity of high severity, exceeded only by Lodz and Banat; the other measures of need were close to the medians. In spite of the second highest ratio of specialists per 10,000 population (Fig. 8) and, with Northwestern Vermont, the lowest ratio of general practitioners to specialists, levels of persons with hospital admissions and of volume of hospital nights were relatively low. On the other hand, it might be asked whether the relatively generous provision of physicians in clinical practice is associated with the observation that Baltimore (together with Buenos Aires) had the highest relative volume of physician contacts. Or was this high volume of use a response to high levels of perceived morbidity of high severity or a manifestation of the provision of preventive services or of more intensive ambulatory care substituting for hospital care? Was it associated with a predominantly fee-for-service system in a study area which, again like Northwestern Vermont, had the highest level of individual responsibility for personal health care expenditure as measured by national figures? How was a relatively modest provision of pharmacists per 10,000 population able to provide the second highest volume of medicine use if in Northwestern Vermont, with almost twice the pharmacist-to-population ratio, the level of medicine use was only moderately higher than in Baltimore? Would larger supplies of selected health care personnel provide more, different, or improved care for the relatively high proportion of persons with perceived morbidity of high severity?

**Buenos Aires** (Fig. 18), like Baltimore a metropolitan area, also
had a relatively high level of perceived morbidity of high severity and, in addition, high levels for persons with sick days and for volume of sick days. The other measures of perceived need—particularly for persons with chronicity with disability, persons bedfast for 14 days, and persons with one or more indicator conditions—were all relatively low, whereas the level of anxiety as measured in this study was fourth highest in Buenos Aires, exceeded only by the levels in Lodz and the two Yugoslav study areas. Again, it may be asked whether the relatively high volume of physician contacts (as high as that for Baltimore) was attributable to the fact that Buenos Aires had the highest relative level of physicians in clinical practice, by far the highest ratio of specialists per 10,000 population (see Fig. 8), and an open health care system with largely fee-for-service payment in ambulatory care. Was this trend encouraged by the relatively high levels of anxiety in the population, or by the fact that Buenos Aires had the lowest ratios of both total beds and short-term beds per 1000 population, a large portion of these in public hospitals? Or were both sets of factors important? Can all segments of the population have had equal access to health care when this study area had the highest level (after the two United States study areas) of individual liability for personal health care expenditure but ranked fourth lowest among all study areas in per capita health expenditure? Do relatively low levels of persons using non-prescribed medicines and a close to median level for total volume of medicine use suggest that patients tended to seek physician contacts rather than use non-prescribed medicines? Or must they seek physician contacts in order to obtain medicines, since the percentage of medicines available by prescription only was by far the highest among all study areas?

In contrast to the 2 metropolitan study areas in North and South America, Liverpool (Fig. 19) showed considerable balance between the measures of need, resources, and use employed. Were the relatively higher rates of persons with physician contacts and even of volume of contacts, in contrast to relatively low ratios per population of total physicians and physicians in clinical practice, manifestations of greater productivity or efficiency? Did they reflect the influence of a health care system that fosters continuity of care from general practitioners? By contrast, did the comparatively generous supply of total beds and a supply of short-term beds close to the median, in conjunction with relatively low levels of hospital use, suggest less hospital efficiency, as reflected by the lowest hospital bed turnover rate of any of the study areas? Or should it be expected that the relative levels of hospital use would have been lower and those for
ambulatory care (i.e., physician contacts) higher, since none of the relative levels of perceived need was particularly high in Liverpool?

Helsinki (Fig. 20) was unusual in having by far the highest level of persons who were bedfast for 14 days and a relatively high level of persons with chronicity with disability. On the other hand, the Helsinki study population appeared to manifest the lowest relative level of anxiety and of physician contacts of any of the 12 study areas. An unusually generous supply of pharmacists was associated with the highest volume of medicine use among the 5 European study areas — fourth highest among all study areas. It seems unlikely, however, that contacts with pharmacists were a principal substitute for physician contacts in this study area, since the level of persons using prescribed medicines was above the median and that of persons using non-prescribed medicines below it. Is it reasonable to assume that prevailing health attitudes, knowledge, and health education can explain the reported low level of anxiety and concern, as well as the fact that Helsinki had the lowest relative volume of physician contacts of any study area? Or are the rates for physician contacts explained simply by a relative shortage of physicians providing ambulatory care services? Helsinki had the highest level of contacts with selected health care personnel. Was this due to a comparative lack of availability and accessibility of physicians providing ambulatory services, or was the use of non-physician personnel a deliberate, and possibly more cost-effective, substitute? Were the relatively high level of hospital use and the low level of physician contacts in ambulatory care, in comparison with patterns observed elsewhere (e.g., Liverpool), a logical result of resource allocation policies and was this allocation cost-effective? Is such a balance of services clinically more or less effective than other arrangements? Among the study areas, the relative level of resources in Helsinki was in every instance above the median; the use of services, however, was relatively low in relation to measures both of perceived need and of resources, all in the presence of a level of individual liability for personal health care expenditure that, at the time of the study (1968-69), was the highest among the 5 European study areas.

Łódź (Fig. 21) is a study area in which most of the measures of perceived need employed were considerably above the median, with the levels for sick days, perceived morbidity of high severity, and the presence of indicator conditions highest among all study areas. By contrast, the expenditure on health care, when expressed as a percentage of the national income, and as far as this is reflected by national figures, was at a low relative level among the study areas,
FIG. 12. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — GRANDE PRAIRIE STUDY AREA.
FIG. 14. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND PERCENTAGE OF MEDIAN RATES FOR THE STUDY AREA.
FIG. 15. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — JERSEY STUDY AREA.
FIG. 16. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — NORTHWESTERN VERMONT STUDY AREA
FIG. 17. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — BALTIMORE STUDY AREA
FIG. 18. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — BUENOS AIRES STUDY AREA
FIG. 19. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) -- LIVERPOOL STUDY AREA
FIG. 21. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — LODZ STUDY AREA.
FIG. 22. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) —
BANAT STUDY AREA

HEALTH SERVICES
FIG. 23. RELATIVE DISTRIBUTIONS OF COMPARATIVE MEASURES OF PERCEIVED NEED, RESOURCES, AND USE AS PERCENTAGE OF MEDIAN RATES FOR PERSONS USING SERVICES (P) AND VOLUME OF USE (V) — RIJEKA STUDY AREA
while individual liability for personal health care expenditure was also low. What was the contribution to health care of the remarkably high supply of selected health care personnel, over twice that of any other European study area, since the number of persons in contact with them was at the lowest relative level (with Banat), and the volume of such contacts was by far the lowest among all study areas? Was the fact that Lodz has the highest relative volume of hospital nights and long lengths of stay, as indicated by a relatively low level of persons admitted, associated with the admission of patients who were sicker, or was it related to comparatively low productivity on the part of hospitals and their staff and the second lowest hospital bed turnover rate among the study areas? Or was it a mixture of several factors? Was the relatively ample supply of pharmacists cost-effective in relationship to low relative levels both of persons using prescribed and non-prescribed medicines and of the total volume of medicine use?

Banat (Fig. 22) also had levels of need that were consistently above the study area median and particularly high for 14-day bedfastness and chronicity with disability, the latter being at the highest level among the study areas. Banat also had the second highest level (after Lodz) for persons with one or more indicator conditions and by far the highest relative level of anxiety, as measured by the Cornell Medical Index, of any of the 12 study populations. By contrast, all resource supplies were at relatively low levels; health care expenditure as a percentage of national income was second lowest (the same as for Rijeka but higher than for Lodz), although financial barriers as measured by individual liability for personal health care expenditure were the lowest for any of the 12 study areas. Despite the relatively low level of supply both of total physicians and of physicians in clinical practice, it should be noted that the latter provided substantial services, as reflected in the levels of persons with physician contact and a volume of contacts above the median, possibly reflecting differences in productivity and efficiency. Since the high relative level of anxiety in Banat was associated with the lowest levels of persons using non-prescribed medicines and total volume of medicines used, it would be of interest to know how the population dealt with its health concerns. If people did use medicines relatively infrequently compared with other study areas, and if their contacts with physicians must be assumed to have been brief, while not infrequent (because this study area had a relatively low level of supply of physicians in clinical practice), how then did they cope when they also had relatively low levels of supply of selected health care
personnel? Was the manifestation of a high level of anxiety a reflection of the relative lack of availability of services, or was the response to the respective questions in the interview the result of cultural differences, similar to those which may have prevailed in Lodz and Rijeka?

The other Yugoslav study area, Rijeka (Fig. 23), also had levels of perceived need that were generally above the median, and clearly so for measures of perceived chronicity with disability and 14-day bedfastness; the level of anxiety was the third highest of any study area. Resource levels were relatively close to the median except for pharmacists, who constituted the third lowest supply among the study areas. Relative levels of use of services were also close to and in most instances below the median; the use of medicines was among the lowest for all study areas. Where should a health care system that is gradually bringing needs, resources, and use into balance make its next investments in order to reduce levels of need for care, particularly for the chronically ill and bedfast? Should the supply of physicians be increased and should they be generalists or specialists? Should more hospital beds be provided? If so, should these be short-term or long-term beds? Should the relatively generous supply of selected health care personnel be increased or should the present supply be deployed differently? Or again, were health services for the chronically ill supplemented by alternative modalities of care?

The comments on the study areas in this section have been designed to stimulate discussion and provoke thought. Some will doubtless prompt concern about the utility of the observations, but it is hoped that they will promote wider use of the concepts and methods developed. The patterns described are of interest in themselves and suggest possible ways of modifying health care arrangements. The aggregation of data for the study areas will have served its purpose if other investigators are encouraged to develop more accurate data and to transform them by improved analytical methods into better systems of health information.

SOME IMPLICATIONS OF THE STUDY FINDINGS

An instructive way of highlighting the practical implications of the study findings is to examine the differences between some of the extremes observed and to extrapolate them to a hypothetical population of one million. Table 5 shows the maximum and minimum measures for the most important indicators of medical need, resources, and
TABLE 5. RANGES OF TOTAL STANDARDIZED RATES OF PERCEIVED NEED AND USE AND OF RESOURCE RATIOS: ESTIMATED DIFFERENCES PER ONE MILLION POPULATION

<table>
<thead>
<tr>
<th>Variable</th>
<th>Perceived Need&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized rate&lt;sup&gt;b&lt;/sup&gt;/Resource ratio&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum ±SE</td>
<td>Minimum ±SE</td>
</tr>
<tr>
<td>Persons with bed days</td>
<td>176 5 101</td>
<td>5</td>
</tr>
<tr>
<td>Volume of bed days</td>
<td>1 137 46 304</td>
<td>41</td>
</tr>
<tr>
<td>Persons with restricted activity days</td>
<td>150 5 32</td>
<td>3</td>
</tr>
<tr>
<td>Volume of restricted activity days</td>
<td>722 34 181</td>
<td>18</td>
</tr>
<tr>
<td>Persons with sick days</td>
<td>280 7 153</td>
<td>5</td>
</tr>
<tr>
<td>Volume of sick days</td>
<td>453 7 268</td>
<td>8</td>
</tr>
<tr>
<td>Persons reporting illness</td>
<td>116 7 150</td>
<td>6</td>
</tr>
<tr>
<td>Persons with chronicity with disability</td>
<td>437 7 330</td>
<td>5</td>
</tr>
<tr>
<td>Persons with dental problem</td>
<td>17.9 1.1</td>
<td></td>
</tr>
<tr>
<td>Persons with vision problem</td>
<td>5.0 0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total beds 14.4</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>Hospital bed care nurses 50.0</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>Ambulatory care nurses 33.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Use: it should be noted that the differences in all these measures are substantial as well as statistically significant. The data for the 12 study areas are presented in this manner to indicate the order of magnitude of the resources to be allocated; there is no implication that either the maximum or minimum ratios are optimal choices, but
### TABLE 5 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardized rate$^a$/Resource ratio$^b$</th>
<th>Difference per million population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum $\pm$SE</td>
<td>Minimum $\pm$SE</td>
</tr>
<tr>
<td>Use$^c$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persons with physician contact</td>
<td>202     7          120     5</td>
<td>82 000 persons</td>
</tr>
<tr>
<td>Volume of physician contacts</td>
<td>306     13         158     7</td>
<td>146 000 contacts</td>
</tr>
<tr>
<td>Volume of face-to-face contacts</td>
<td>297     13         141     7</td>
<td>166 000 contacts</td>
</tr>
<tr>
<td>Persons with overnight hospital admission</td>
<td>156     5           65      4</td>
<td>91 000 persons</td>
</tr>
<tr>
<td>Volume of overnight hospital admissions</td>
<td>213     8           72      4</td>
<td>141 000 admissions</td>
</tr>
<tr>
<td>Volume of hospital nights</td>
<td>2 399    191       732     84</td>
<td>1 667 000 nights</td>
</tr>
<tr>
<td>Persons using medicines</td>
<td>612     10          238     5</td>
<td>374 000 persons</td>
</tr>
<tr>
<td>Volume of different medicines used</td>
<td>1 202    26         391     11</td>
<td>811 000 medicines</td>
</tr>
<tr>
<td>Persons using prescribed medicines</td>
<td>344     9           160     5</td>
<td>164 000 persons</td>
</tr>
<tr>
<td>Volume of different prescribed medicines used</td>
<td>645     21          281     10</td>
<td>384 000 medicines</td>
</tr>
<tr>
<td>Persons using non-prescribed medicines used</td>
<td>399     10          97      4</td>
<td>302 000 persons</td>
</tr>
<tr>
<td>Volume of different nonprescribed medicines used</td>
<td>567     16         109     5</td>
<td>488 000 medicines</td>
</tr>
<tr>
<td>Persons with dentist contact</td>
<td>126     6           65      4</td>
<td>61 000 persons</td>
</tr>
<tr>
<td>Volume of dentist contacts</td>
<td>251     12          88      6</td>
<td>163 000 contacts</td>
</tr>
<tr>
<td>Persons with vision examinations</td>
<td>25      3           9       1</td>
<td>10 000 persons</td>
</tr>
<tr>
<td>Persons with selected health care personnel contact</td>
<td>109    4           41      3</td>
<td>68 000 persons</td>
</tr>
<tr>
<td>Volume of selected health care personnel contacts</td>
<td>167    9           62      6</td>
<td>105 000 contacts</td>
</tr>
</tbody>
</table>

$^a$ Per 1000 population.  $^b$ Per 10 000 population, except for hospital beds (per 1000 population).  $^c$ The recall periods for the various measures of perceived need and use are shown in Tables 3 and 4.

The magnitude of the differences reflects the cost of the choices facing a planner or policy-maker. This should encourage critical thinking by those responsible for resource allocation in any setting and emphasize the need to develop and use better measures of effectiveness, productivity, and efficiency.

For example, the difference of 2080 physicians between the minimum and maximum supply available to a theoretical population
of one million could represent the continuing absorption of the annual output of an entire medical school, allowing for attrition, emigration, retirement, and death. Similarly, the 10,510 nurses could represent the annual output of several schools of nursing or similar programmes. The figures for beds are even more dramatic; 4400 short-term hospital beds could mean 6 or 7 district hospitals of 600 or 700 beds each or twice as many smaller 300-bed community hospitals. The 8500 long-term beds could represent as many as 10 or 12 large chronic disease or mental hospitals or as many as 100 smaller nursing and convalescent homes in the community. All of these are substantial commitments of resources; their costs and their relative benefits need to be considered seriously by those responsible for resource allocation, and every country and area should encourage critical consideration of all investments in manpower and facilities and their balance and organization.

With respect to productivity, if the postulated 141,000 overnight hospital admissions annually per million population were cared for in the study area with the highest hospital bed turnover rate (46.3 patients per bed per year), some 3500 short-term beds or 5 to 6 hospitals of 600 to 700 beds each would be required. However, if the same number of patients were cared for in the study area with the lowest hospital bed turnover rate (20.9 patients per bed per year), 6700 beds or 9 to 11 hospitals of 600 to 700 beds each would be required to care for them. In all of this, however, the relative effectiveness of such measures in terms of outcomes for target populations and in relation to the prevailing social and cultural conditions should be considered before productivity or efficiency can be truly assessed. Nevertheless, the adoption of the highest or lowest of the abovementioned extremes would make a large difference to investment and the considerations involved might therefore be of special value to developing countries. They emphasize the importance of supporting planning by even simple types of health information that might not be too difficult to obtain.

The summaries of the findings and the possible explanations, even if conjectural, provide some indication of the impact of different combinations of manpower and facilities and of different levels of productivity and efficiency on the use of what are likely to remain scarce and expensive resources in virtually all health care settings in the foreseeable future. Even if the magnitude of the differences is viewed sceptically, their existence should encourage further comparisons in order to obtain more precise estimates. More specifically, they should encourage individual areas and countries to seek the
optimal combinations of resources in meeting their own needs for health care. Finally, these comparisons should encourage planners and politicians to link the development of the health sector with the development of other sectors of society.
CHAPTER 5

APPROACHES TO RESOURCE ALLOCATION

The allocation, organization, and evaluation of human, technological, financial, and physical resources are the principal functions of planning. Even in the present inadequate state of knowledge about causes and effects in large social systems, planners are still required to plan as rationally as possible. Ample time and generous planning resources enabling perfect solutions to be developed are rarely at the planner's disposal; most improvements in planning are incremental.

This section deals with the following important approaches derived from the experiences of the International Collaborative Study that should prove useful to planners:

- Balance between needs, resources, and use
- Substitution among resources
- Productivity of health care systems
- Target groups
- Unmet need.

Many of these ideas have already been described in the publications of the study.\(^1\) Some emerged as the study progressed and analysis of the data was completed.

BALANCE BETWEEN NEED, RESOURCES, AND USE

There are number of ways in which comparable data on perceived need, resources, and use can be combined so as to advance our

\(^1\) See footnote 1 on page 33.
understanding of their relationships. It is possible, for instance, to compare areas with respect not to whether their arrangements for promoting health care are “better” or “worse”, but rather whether a relative balance has been achieved between perceived need, resources, and use. For this purpose, geographically defined areas (e.g., the Collaborative Study areas) can be divided in relation to whether they are above or below the medians for appropriate measures of need, use, and resources, provided these are defined uniformly for all the study areas and based on comparable data.

Table 6 shows a model in which areas can be assigned to one of 8 cells on the basis of their relative balance of need, resources, and use. The assignment depends on the findings for each area being above or below the median level of need, resources, or use for all areas in the set. In this model, for example, a relatively high level of resources and a relatively high rate of use in the presence of a relatively high rate of perceived need is defined as balance (Type A). Here, the population’s perceived need for physician or hospital care is reflected in a supply of physicians or of hospital beds in appropriate combination and in levels of use that indicate neither excess capacity of, nor unmet demand for, a particular resource category. Conversely, a relatively low level of resource allocation, in conjunction with relatively low use in the presence of low need, is also regarded as constituting balance (Type H).

Using this framework, it can be argued that, as an area or country achieves a reduction in the level of that need for which efficacious intervention by health care resources is possible, it is probably desirable to reduce the investment in such resources. As a consequence of such a reduction, first in perceived need and then in resources, the levels of use should decline commensurately, since health services are no longer needed or provided to the previous extent. Indeed, perceived need may have become relatively low because of high resource allocation and high use appropriate to former levels of perceived need. Such a shift from Type A to Type H could be considered a logical step in the planned evolution of a health service system in accordance with a model for planning that uses the feedback of health statistics and information to guide decisions. A cybernetic model like this would not allow the investment in costly resources to continue longer than is justified by the perceived needs of the population, because the information made available to decision-makers would show them that the use of the services or the allocation of resources has become excessive in relationship to perceived need.
### Table 6. Model of Relationships Between Need, Resources, and Use

<table>
<thead>
<tr>
<th>Use</th>
<th>High need</th>
<th>Low need</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High resources</td>
<td>Low resources</td>
</tr>
<tr>
<td>High</td>
<td>TYPE A</td>
<td>TYPE B</td>
</tr>
<tr>
<td></td>
<td>Balanced</td>
<td>Compensatory</td>
</tr>
<tr>
<td></td>
<td>appropriate</td>
<td>high productivity</td>
</tr>
<tr>
<td></td>
<td>allocation of</td>
<td>of resources</td>
</tr>
<tr>
<td></td>
<td>resources</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>TYPE C</td>
<td>TYPE D</td>
</tr>
<tr>
<td></td>
<td>Unbalanced</td>
<td>Unbalanced</td>
</tr>
<tr>
<td></td>
<td>underuse of</td>
<td>under-</td>
</tr>
<tr>
<td></td>
<td>resources</td>
<td>investment in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>resources</td>
</tr>
</tbody>
</table>

NOTE: Needs, resources, and use may be defined by any appropriate measures as long as they are uniform over all the areas being considered.

As a rule, however, decision-makers cannot respond quickly to such information. The phasing-out of acute hospital beds is not always an option, though moving towards a lower ratio of hospital beds to population by not building facilities to keep step with population growth is one. Nor can physicians be exported as a matter of policy, but improvement of their distribution, reduction of immigration, reduction in the size of medical school classes, and a policy of not filling vacancies caused by retirement are options that can be exercised over time. The change is evolutionary, rarely radical; and, in fact, when countries or areas within a country are compared, it is obvious that, relative to each other, they are frequently not balanced in respect of resource allocation, investment, or productivity (i.e., the volume of services produced without reference, however, to their effectiveness or efficiency). For instance, the combination of relatively low use and low resource levels in the face of high perceived need (Type D in Table 6) suggests relative underinvestment of resources; the use rates are low simply because there are not enough resources to service the perceived needs of the population. The unmet need in such circumstances will be high. The combination of low use and high resource levels in the face of high need (Type C) is equally disturbing, for it suggests that there is underuse of resources, which may be due to a variety of reasons:
<table>
<thead>
<tr>
<th>Relative position on need-resource-need scale</th>
<th>Type</th>
<th>Physicians in clinical practice</th>
<th>Short-term hospital beds</th>
<th>Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balanced -- appropriate allocation of resources</td>
<td>A</td>
<td>Buenos Aires</td>
<td>Helsinki</td>
<td>Liverpool</td>
</tr>
<tr>
<td>Unbalanced -- low productivity of resources</td>
<td>B</td>
<td>Liverpool Banat</td>
<td>Lodz</td>
<td>Helsinki</td>
</tr>
<tr>
<td>Unbalanced -- underuse of resources</td>
<td>C</td>
<td>Helsinki Rijeka</td>
<td>Liverpool</td>
<td>Banat</td>
</tr>
<tr>
<td>Unbalanced -- overuse of resources</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balanced -- high productivity of resources</td>
<td>E</td>
<td>Saskatchewan Baltimore</td>
<td>Grande Prairie Fraser</td>
<td></td>
</tr>
<tr>
<td>Unbalanced -- underinvestment in resources</td>
<td>F</td>
<td></td>
<td>Jersey</td>
<td></td>
</tr>
<tr>
<td>Unbalanced -- overinvestment in resources</td>
<td>G</td>
<td>Fraser</td>
<td>Saskatchewan</td>
<td></td>
</tr>
<tr>
<td>Balanced -- appropriate allocation of resources</td>
<td>H</td>
<td>Grande Prairie Jersey Northwestern Vermont</td>
<td>Baltimore</td>
<td>Fraser</td>
</tr>
</tbody>
</table>
inappropriateness or inaccessibility of the resources, inadequate coverage, lack of knowledge, financial barriers, behavioural factors impeding use, or a combination of these.

In contrast, the pattern of high use and low levels of resources in the face of high perceived need (Type B) implies compensatory high productivity with relatively few available resources. Here the high level of fulfilled demand may deplete the resources or may alter their efficiency and effectiveness; this imbalance may as a result delay the shift of an area or country from high need to relatively low need. Similarly, in a situation of relatively low need, a low use of services may indicate overinvestment in resources (Type G) or, on the basis of high use, overuse of resources (Type E). Finally, imbalance is also reflected in relatively high use and probably high productivity of available resources in the presence of relatively low levels of both need and resources (Type F). Relative imbalances such as Types E and F seem characteristic of health care systems with a strong incentive through payment mechanisms to fill hospital beds or to occupy the available working time of health professionals.

Types B and F are, however, the last stages before relative balance at the two extremes is achieved; the strain of high productivity necessitated by relatively limited resources can be relieved by more resources if the need is high or, if the need is low, by disincentives to use or by education of the public in more appropriate use of self-care, family care, or the formal health care system.

The arrows on Table 6 imply the desirable and probable direction of movement between the different types to achieve balance for a specific level of need, although other transitions and combinations are possible in practical situations. For example, there could be a shift from Type G to Type H, a reduction in demand in both State-controlled and free-market economies being accompanied by a reduction in supply. But as perceived need falls (as it should, if the health care system is effective), Type A should shift to the unbalanced state of E or G and, as a consequence, the resource allocation must eventually be reduced because of, or in order to produce, a decline in demand and use.

These 8 hypothetical combinations of needs, resources, and use can be expressed in more concrete terms, as shown in Table 7, which sets out the data from the International Collaborative Study for 3 different resource modalities. Here each study area was allocated to one of the 8 types described above according to whether it lay above or below the median for all 12 study areas for each combination; i.e., need (volume of sick days), one of 3 resource ratios (physicians in clinical practice, short-term hospital beds, and nurses),
and use (volume of physician contacts, hospital nights, and nurse contacts). These indexes are based on total non-standardized rates or ratios per 1000 population, a standard epidemiological practice. Although the time period for recall of nights in hospital is not the same as for the other measures of use, this does not detract materially from their overall value as a relative indicator of use or from their utility in a discussion of the relationships and the conceptual model employed.

For example, on the basis of the measures shown in Fig. 12-23, Buenos Aires is the only study area to have a balanced allocation (Type A) of physicians (although clearly not of hospital beds and nurses) in the face of a high relative level of need in terms of the volume of sick days in the population. This means that it has a high supply of physicians in clinical practice and a high volume of physician contacts. At the other extreme, Grande Prairie, Jersey, and Northwestern Vermont show a balanced allocation of physician resources in the face of low need (Type H). There are 3 study areas—Banat, Liverpool, and Rijeka—with compensatory high physician productivity (Type B) and 2—Lodz and Banat—with compensatory high hospital productivity. By contrast, there is one, Fraser, with an unbalanced high investment in physician resources that suggests possible excess capacity (Type G) and unbalanced over-use of hospital beds (Type E). Helsinki and Lodz, on the other hand, are 2 study areas with underuse of physician resources, suggesting either that there is an imbalance in the supply of physicians in clinical practice or that the physicians practise under arrangements that do not require, favour, or facilitate a relatively high volume of ambulatory contacts (Type C). Although the position of individual study areas in this model varies among the 3 modalities of use and resources, there appears to be a spread of study areas among 7 of the 8 possible combinations.

The data suggest action these study areas might take to balance specific resource allocation, need, and use in relation to the comparison study areas or to some other desirable model. Helsinki is in balance with short-term hospital beds and nurses, but makes relative underuse of physician resources in the face of high need and a physician supply ratio that is above the median for all 12 study areas. An overall balance in the Banat and Lodz study areas would require relief of the pressure for relatively high productivity generated by relatively high levels of perceived need and the relatively low levels of resources allocated; for example, by an increase in resources such as the number of physicians in clinical practice in Banat or of short-term hospital beds in both Lodz and Banat or a reduction
in the administrative requirements for certificates and physical examinations, which were found to be high in both study areas.

The 6 North American study areas are frequently unbalanced in the face of low perceived need, the resources being generally in oversupply (except for short-term hospital beds and nurses in Jersey). The options open to policy-makers would include a reduction in resources and in "unnecessary" or "excessive" demand from the population or perhaps from some segments of the population. It is clear that a simple survey of all areas or regions within a single country along these lines would assist policy-makers in deciding which options for each area, and for all areas combined, would be most likely to bring the overall health care system into an acceptable balance based on societal values and political decisions. Although the International Collaborative Study is a study of 12 different study areas in 7 different countries of the world, the standardization of methods of data collection and of measuring instruments make its cross-national analysis analogous to a cross-regional study within a single country; as such, it illustrates the value of this way of thinking about resource allocation.

SUBSTITUTION AMONG RESOURCES

The combination of different health services listed in Table 7 clearly suggests the possibility of substitution among resource modalities. In fact, Helsinki, which underuses physicians, is relatively balanced for short-term hospital beds; Baltimore, which overuses physicians, is also balanced for short-term beds. Buenos Aires, Grande Prairie, Jersey, and Northwestern Vermont, with a balanced allocation of physicians in clinical practice (although only in Buenos Aires in the face of high need), are not balanced with respect to short-term hospital beds and their use. Buenos Aires appears to show relative underinvestment in short-term hospital beds (in fact, the lowest supply ratio among the 12 study areas; see Fig. 11), Grande Prairie relative overuse, and Jersey relatively high productivity of this resource.

When the capital investments and operating costs of different modalities of care are considered, substitutions of resources appear even more significant. The substitution of physician resources for hospital resources is a specific example of the general case. Assuming that the outcomes are of comparable effectiveness and acceptability, the substitution of a less expensive modality for a more expensive one would clearly be desirable. Table 8 is a model for consideration of the effects of substitution, depicting the probable impact on
**TABLE 8. CONSUMPTION–SUBSTITUTION MODEL**

<table>
<thead>
<tr>
<th>Low-cost modality</th>
<th>High-cost modality</th>
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<tbody>
<tr>
<td></td>
<td>High consumption</td>
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<tr>
<td>High consumption</td>
<td>Types A, A'</td>
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<td></td>
<td>Expensive combination</td>
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<tr>
<td>Low consumption</td>
<td>Types C, C'</td>
</tr>
<tr>
<td></td>
<td>Expensive substitution</td>
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</tbody>
</table>

Types A - D are based on persons with use, e.g., with physician contact or hospital admission.
Types A' - D' are based on volume of use, e.g., of physician contacts or hospital nights.

**NOTE:** The hypothetical consumption-substitution models for relatively low-cost modalities such as contacts with physicians providing ambulatory care or community nurses and relatively high-cost modalities such as admissions to short-term hospitals or use of prescriptive testing are examples of relatively expensive and inexpensive combinations.

Consumption rates of different combinations. In this connexion, it is important again to emphasize the difference between the rates for persons who use services and the rates for the volume of use of such services. Very little is known about the relative clinical value of differences in frequencies of physician contact or durations of hospital stay, but it is clear that the differences have a major impact on the cost of health services.

Areas with a relatively higher consumption, measured by either persons or volume, of a high-cost modality (e.g., short-term hospital beds) than of a low-cost modality (e.g., community nurses) may be said to have made an expensive substitution (Types C and C'). However, as one relatively low-cost modality (e.g., physicians providing ambulatory care) may, through control over derived demand, determine the use of or the points of entry into a high-cost modality (e.g., inpatient hospital care), areas with a high use of both low-cost and high-cost modalities may be said to have made no substitution, but instead to have an expensive combination (Types A and A'). Conversely, an area with a high consumption of a low-cost modality and a relatively low consumption of a high-cost modality may be said to have made an inexpensive substitution (Types B and B'); and, similarly, areas with low rates for the use of both high-cost and low-cost modalities may be said to have an inexpensive combination (Types D and D').
The issue of substitution, however, cannot be considered without also considering the perceived need. Expensive substitution in the face of low need is a misallocation of resources; in the face of high need, it would be a rational reflection of a social policy that places a high social worth upon fundamental technology (assuming that the technology is in fact efficacious) in contrast to half-way technology of uncertain efficacy or of benefit only to a small segment of the population.

To illustrate this kind of analysis in a comparison of areas or population groups, the study areas of the International Collaborative Study are shown in Table 9, again according to their location above or below the medians for all 12 study areas of population-based rates. Here rates derived from the volume of physician contacts and of hospital nights are related to the rates derived from persons with sick days. Again, the recall periods of hospital use and need are not the same, but this should not affect the logic of the argument.

In general, 3 of the Canadian study areas (the Saskatchewan study area is an exception) appear to favour an expensive substitution, the

<table>
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<tr>
<th>Resource combinations and substitutions</th>
<th>Perceived morbidity&lt;sup&gt;a&lt;/sup&gt;</th>
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<tr>
<td></td>
<td>High</td>
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<tr>
<td>Type A&lt;sup&gt;'&lt;/sup&gt;</td>
<td>Expensive combination</td>
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<tr>
<td>Type B&lt;sup&gt;'&lt;/sup&gt;</td>
<td>Inexpensive substitution</td>
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<td>Type C&lt;sup&gt;'&lt;/sup&gt;</td>
<td>Expensive substitution</td>
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<td>Type D&lt;sup&gt;'&lt;/sup&gt;</td>
<td>Inexpensive combination</td>
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</tbody>
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<sup>a</sup> Derived from volumes of physician contacts and hospital nights.

<sup>b</sup> Derived from persons with sick days.
historical development of hospital insurance before medical care insurance in that country having been credited with the production of this hospital-intensive system. Strong efforts are now being made by policy-makers in Canadian provinces to reduce the ratio of hospital beds to population; this is an appropriate response in the face of low perceived need. Five study areas—the Saskatchewan study area, Buenos Aires, Rijeka, Baltimore, and Liverpool—have developed their systems to favour an inexpensive substitution, the first 3 in the face of relatively high perceived need, the last 2 for relatively low levels of need. Helsinki and Lodz, on the other hand, resemble the 3 Canadian study areas mentioned in that they are hospital-intensive, although they have higher levels of perceived need.

This model suggests another way in which policy-makers can view areas or regions within a single country and, in the face of cost constraints both in the areas and in the country's health care system as a whole, make more rational decisions concerning options that will improve distributional equity.

The significance of the substitutability of resources was also suggested by certain substantive results from the International Collaborative Study. As indicated in Chapter 4, the mixture of different types of physicians in clinical practice (generalists and specialists and ambulatory and inpatient) and, among the numerous ratios examined, the ratio of physicians to hospital beds, particularly short-term beds, appeared to be as important in determining the volume of hospital nights consumed as the supply ratio of beds. Also, the way in which resources were made available was probably a more important determinant in the use of services than were absolute resource-to-population ratios.

Further, the selected categories of non-physician health care personnel with both delegated and independent responsibility in ambulatory care, including nurses, seemed to be deployed differently across the study areas. In Helsinki they appeared to provide a substantial component of the care for children, the elderly, and those confined to their homes; in the Saskatchewan study area and Northwestern Vermont, where they were in relatively generous supply, they appeared to be in touch with smaller proportions of the population and provided smaller volumes of services. These substitutions may be noted in comparisons of the ratios of physicians in clinical practice and nurses. Such comparisons between areas with different substitution patterns are particularly relevant when studying patterns of what is variously described as general or primary health care in relationship to other levels of care.
The models described in Tables 6 and 8 suggest that the expected response of the health care system to a shortage of a resource will be increased productivity of that particular resource, in the sense not necessarily of increased efficiency or effectiveness but of an increased volume of services. Clearly, however, it would be desirable to measure all the 3 components, and to do so within the same time period.

In the International Collaborative Study, the proportions of people with physician contacts in the various health care systems studied were not too dissimilar, although the frequency of their contacts, and hence the total volume of contacts for the population served, varied with the system. Thus, productivity appeared to be a function of the system and its organization, as would be expected if the system were trying to cope with a relatively heavy demand. The demand was initiated by the population, generated by physicians or other health care personnel (i.e., derived demand), stimulated by financial or payment arrangements, or created by administrative requirements.

It should be emphasized that the term productivity as employed here can be used to describe how an area or a country is coping with an imbalance or unusual combination of resources or a deliberate substitution of one resource for another. It does not cover the question of how the available resources might be better deployed; the system might be coping with the demand by increasing the productivity of an inappropriate or, because of its cost and other effects, a counterproductive resource. Just as a piped water system has both positive and negative health effects and requires special arrangements for dealing with typhoid fever or amoebiasis, so a health care system may be productive in terms of meeting some demands but counterproductive in terms of stimulating new demands it cannot effectively meet. However, within the constraints of such a policy as may be determined in a single area or country, productivity measures as used here can give some indication of the effort the system is making within its given allocation of resources.

In the 6 North American study areas, largely dominated by a fee-for-service remuneration system for physicians (and, in Canada and for much of the United States population, an insurance mechanism for financing medical care), there is high productivity, especially of the physician sector (i.e., high rates for patient contacts with physicians in clinical practice). The same tends to occur where other services, apart from per diem charges, are reimbursed on a unit basis, as in
short-term hospitals in the USA (i.e., high rates for short-term hospital bed turnover). The choices here are in part social, but should also be based on measures of outcomes of the health care system, which the International Collaborative Study did not examine. The largely rural nature of 3 of the Canadian study areas is associated with a commitment to hospital care. Is that because rural patients find adequate hotel or lodging accommodation difficult to find in the towns where the hospitals are located and therefore prefer to go directly into the hospital at trivial personal cost and minimal inconvenience? Or is it because the physician finds it easier to visit a hospital than to drive some distance to attend his rural patients? One alternative solution open to the policy-maker noting and accepting the relatively high productivity of the physician resource would be to stimulate the development of hotel accommodation close to existing sites of care rather than provide new ambulatory care facilities. The solution to this resource allocation problem may, in fact, be development of social services by other sectors, not the provision of health care resources.

At the systems level, productivity is affected by the multiple use of a resource. For example, referrals among physicians showed more than fourfold differences among the study areas and tended to be more frequent in all 5 European study areas. These differences, probably reflecting differences between the relatively unstructured systems in the 6 North American study areas and Buenos Aires and the more structured systems in the 5 European study areas, represent the extent of formal and informal cooperation between the components of each system and particularly between the public and private sectors. This is consistent with the finding that the European study areas, with Helsinki as an exception, tended to have fewer points of entry into the system than the other study areas.

The control of points of entry, and structural arrangements such as the location of first-aid stations, health centres, group practices, rural hospitals, or district (regional) hospitals, may thus be a proper and reasonable response to high productivity in the face of low levels of need.

TARGET GROUPS

The planner or policy-maker can also choose to allocate resources so that the needs of the most vulnerable groups receive the highest priority. If the target is appropriately selected (such as a population susceptible to a protracted or fatal illness), a focused distribution of services is a wise policy decision. The principle here is to know
the characteristics of the population at risk and deliberately to deploy resources to meet its needs. Essentially, this rationing of resources to those who will benefit the most or are considered to be most in need of services. The action may be taken on epidemiological or on social grounds or on both.

Data from the International Collaborative Study permit at least a broad consideration of some target groups.

**Age and sex**

Traditionally, the elderly, children, women of child-bearing age, and working adults are target populations; they are the principal groups for whose needs a health care system is mobilized. Fig. 24 shows considerable variation throughout the 12 study areas in volumes of physician use within a period of 2 weeks by age and sex groups in several study areas. Specific rates of contacts for adults by age and sex generally increase with age. They tend to be higher for females than for males, with 10 of the 12 highest rates in the study areas observed for persons of 65 years or older, 6 for females and 4 for males. In most study areas the rates for adults are higher than those for children, Banat being the exception. There is little evidence from these data that particular target groups are identified by age or sex groupings in any of the 12 study areas. Indeed, all 12 seem to have relatively consistent patterns. In fact, when rates standardized by age and sex are calculated for persons with physician contacts (Fig. 25), there is little variation throughout the study areas, especially when physician contacts are studied for a 12-month recall period. Thus, the consumption of physician services in all the study areas follows very generalized age requirements, with little evidence from the data that special emphasis groups have been identified in a specific country.

Although ambulatory health care appears to offer better prospects for emphasis than inpatient hospital care because it provides some prevention and much early detection of disease, it is in inpatient care that the major part of medical care expenditure, both capital and operating, is incurred at present. Increased emphasis on ambulatory care and the avoidance of inpatient care can be expected to reduce the overall costs, and it is of interest, therefore, to examine the variations in hospital use by age over the study areas. Are there any target groups apparent?

Fig. 26 suggests that there may be. Banat, Buenos Aires, Liverpool, and Rijeka, for instance, have lower rates of hospital nights than expected for females aged 65 years or more; and Baltimore,
Banat, Northwestern, Vermont, and Rijeka for females 45-64 years of age. But is this owing to cultural patterns, family responsibilities, or pressure for beds? It is deliberate or a general social pattern? Only when a target or emphasis group has been identified and a
FIG. 25. PHYSICIAN USE WITHIN 2 WEEKS AND 12 MONTHS — TOTAL STANDARDIZED RATES AND STANDARD ERRORS PER 1000 POPULATION

policy or objective enunciated is there a basis for evaluating progress. Standardization by age and sex produces considerable differences in hospital use patterns (Fig. 27) when rates for persons with
overnight hospital admission are compared with rates for volume of hospital nights consumed. In considering emphasis or target groups it is important to distinguish between the persons served and the volume of services provided for them. Efficiency, productivity, and
other factors are seen to be of crucial importance in the attainment of specific objectives.

Severity of illness

Another emphasis group is constituted by persons with relatively severe illnesses. It is instructive to compare the rates of physician contacts within a period of 2 weeks in the study areas for those persons who reported having been ill or injured and who had the highest levels of the "bother, hurt, or worry" index that was used to measure the reported severity of the illness in the International Collaborative Study.1 This should be a relatively discriminating measure since it concerns only those respondents who reported the highest level of perceived morbidity (i.e., acute illness) for the period of physician contact (Fig. 28). The patterns within countries (Canada, the USA, and Yugoslavia) are similar, but there are large differences between the 6 North American study areas and Buenos Aires and the 5 European study areas. Liverpool has the highest rate of all, while the 4 continental European study areas have by far the lowest rates. In the case of severe acute illness, therefore, financial barriers to the use of health care do not seem to play an important role, since personal liability for health care expenditure was minimal in all 5 European study areas and moderate to considerable in Buenos Aires, the 2 United States study areas, and, at the time of the field work (1968-69), the 4 Canadian study areas. The reasonably stable

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pattern of overall physician use shown in Fig. 24 can thus be seen to vary considerably over the 12 study areas when the presence of severe acute illness is taken into account.

A yet more informative way of examining the availability and use of physician services among different populations is to take into account or control statistically the different levels of perceived morbidity reported so that the use of the services can be compared on a consistent basis. This is done by calculating and assigning the same levels of severity throughout the study areas. The pattern here shows substantial variations in the rates with which populations use physician services when the influence of the severity of perceived morbidity is held constant (Fig. 29). It does appear, however, that substantial relative priority is given to children over adults in the 2 Yugoslav study areas and, to a lesser extent, in Baltimore, Buenos
FIG. 29: PERSONS WITH PHYSICIAN CONTACT WITHIN 2 WEEKS — 
RATES PER 1000 CHILDREN AND ADULTS STANDARDIZED FOR SEVERITY

HEALTH SERVICES
Aires, Liverpool, and Lodz (i.e., when the level of severity of perceived morbidity is standardized over the study areas, larger proportions of the children than of adult populations in these study areas see physicians).

**Chronicity of illness**

As noted in Fig. 25, there was remarkably little variation in physician use in a 12-month period. Standardization of chronicity (i.e., a physical impairment, handicap, or long-standing health problem or chronic illness) does not greatly affect the rates (Fig. 30). Assuming that a similar burden of chronicity exists throughout the 12 study areas, similar proportions of the population contact a physician at least once in 12 months. Like age, chronicity is a major determinant of use, but the possible differences among the study areas are not reflected in this indicator of use.

**FIG. 30. PERSONS WITH PHYSICIAN CONTACT WITHIN 12 MONTHS — RATES PER 1000 PERSONS STANDARDIZED FOR CHRONICITY**
Administrative requirements

A distinction can be made between the demand for care initiated by the patient, the derived demand largely influenced by the physician once the patient has made the initial contact, and the demand generated by administrative requirements for physician services in the form of physical examinations for school, employment, insurance, military, or other purposes. This form of care can place a substantial burden on health resources, as illustrated by the total crude rates for persons who had a physical examination within 12 months prior to interview because of some administrative requirement unconnected with illness, injury, or childbirth (Fig. 31).

Here the rates are lowest in the 4 Canadian study areas, close to the median in the 2 United States study areas and Buenos Aires, considerably higher in Helsinki and Liverpool, and highest by far in Lodz and the 2 Yugoslav study areas; the range (203 - 759 per 1000

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**FIG. 31. PERSONS WITH ADMINISTRATIVE REASON FOR MOST RECENT PHYSICAL EXAMINATION — TOTAL CRUDE RATES PER 1000 PERSONS WITH PHYSICAL EXAMINATION WITHIN 12 MONTHS**

![Graph showing rates per 1000 study areas](image-url)
population) is almost fourfold about the median of 328. Overall, therefore, about 1 in 3 physical examinations is generated by some administrative or legal requirement. This is a large demand for a procedure of doubtful efficacy in many instances, and a questionable use of medical resources in the face of their relative scarcity. Is this a wise approach to resource allocation?

**Geography, occupation, and social position**

There are other potential emphasis groups only partially considered by the International Collaborative Study that could be the targets of special resource allocation policies: inhabitants of rural areas or special urban centres, occupational groups at high risk, or occupational groups favoured for their contribution to the national economy. Persons of low social position are often identified as target groups, but no effect on the use of services was detected in the study, although several indicators of social position were employed in the analysis. To help these groups, and to obtain greater social equity, even a relatively unequal allocation of resources should be favoured, with a special deployment of resources for vulnerable groups. In the main, there are sound epidemiological as well as social reasons for such emphasis, based on studies of the effects on health status of residence, working conditions, life style, and social position.

**Non-use, underuse, and inappropriate use**

One of the important problems on which the International Collaborative Study specifically concentrated was the failure to use health services. In the context of the psychobiological and behavioural models employed, it tried to establish the impact of predisposing and enabling factors, expressed as attitudes and perceptions that might explain the non-use of the services. In fact, in the participating study areas the principal determinant of non-use was absence of perceived need. On the other hand, the availability of a regular source of medical care was found to favour use and diminish non-use. This is a principle of fundamental importance; the population served should have an identified source of care, be aware of the services provided, and know how to use them. This involves education of the public about health and health services, about recognition of what needs can be met by a formal health service, and about its participation both in its own self-care and in the timely use of health services. Groups characterized by non-use, underuse, and inappropriate use may be emphasized for special attention or special resource allocation.
One way to examine the relative pressure on the most expensive component of a health care system, its hospitals, is to establish the amount of the unmet need for physician services reported by respondents and to compare it with the overall volume of physician contacts and the consumption of hospital nights. In the International Collaborative Study, this unmet need was measured by the percentage of all persons with perceived morbidity of the highest degree of severity within two weeks who, although wanting to contact a physician for their health problem, did not obtain a contact.

The first aspect of this relationship is shown in Fig. 32. There is no apparent relationship between the volume of physician contacts and this measure of hidden pressure on the available physicians (i.e., unmet need). However, the level of unmet need does have a substantial relationship to short-term hospital use (Fig. 33). Where the apparent unmet need for physician services was greatest (i.e., where the percentage of unmet need was highest), the consumption of hospital nights was also greatest. It might be thought that Buenos

**FIG. 32. RELATION TO PHYSICIAN USE OF UNMET DEMAND FOR PHYSICIAN SERVICES**

![Graph showing the relation between volume of physician contacts and unmet demand for physician services.](image-url)
Aires, because it has by far the lowest rate of hospital use and supply ratio of hospital beds among the 12 study areas, might distort the observed relationships, but they hold even when Buenos Aires is excluded. It is of interest that those countries with 2 or more study areas exhibit similar patterns. Banat and Rijeka and Northwestern Vermont and Baltimore are close together; in Canada, a country with universal hospital insurance coverage but without universal medical care coverage at the time of the field work (1968-69), the 4 study areas—Fraser, the Saskatchewan study area, Grande Prairie, and Jersey—cluster closely.

It is suggested that relatively high rates for volume of hospital nights used are inversely related to the availability and accessibility
of ambulatory care, which may be a more important determinant of hospital use than the mere availability of beds; or, in other words, that so-called “excess” bed capacity is not the major determinant of “excessive” hospital use, at least when studied in a larger population-based context rather than in that of the individual institution. The existence of hospital beds may be a necessary but is not a sufficient influence to explain their high volumes of use. That is, most consumption of this high-cost facility represents derived demand, or again, the principal factor contributing to expensive substitution is to be found in the types, patterns, and locus of practice of physicians and in their relationship to hospital beds.
CHAPTER 6

THE INTERNATIONAL COLLABORATIVE STUDY
APPROACH AND HEALTH INFORMATION SYSTEMS

The International Collaborative Study, on which this report is based, attempted to contribute to a better appreciation of basic concepts and methods for national and local health and health care planning and to do so from an international perspective. It focused on population-based measures of perceived need and effective demand (i.e., use) for a wide range of health services, which were related to resources, to certain measures of system productivity, to selected system characteristics and organizational features, and to some non-quantitative descriptions of relationships in each study area. Some of the study's concepts as presented here should, it is believed, have more widespread acceptance if more effective planning and management are to develop.

The single most urgent need is for improved health information systems, however rudimentary they may be. To create these, leadership and coordination by WHO may be essential, although the responsibility rests with individual Member States, which can do much to rethink and modernize their own statistical and information systems.¹,² The available data should be accurate and valid enough for action, and the practical use of current data should help to define the kinds of data to be collected in the future as changes are implemented in the system.


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ROLE OF HEALTH INTERVIEW SURVEYS

The International Collaborative Study shows that population survey methods can be used to derive useful information about the functioning of health care systems that is not available from other sources. The same approaches, perhaps with some necessary modifications, are applicable even, to the least developed countries and regions where large-scale health information systems are unlikely to appear soon, though statistical precision may have to be sacrificed for conceptually valid but numerically rough indicators.¹

Many of the questions asked of respondents in the study were designed to assess the effects of predisposing and enabling factors on the transformation of perceived need into use of health services. Their inclusion was thus of value to a theory of health and sickness behaviour. For planning purposes, measures of need and use, of time lost from work, of disability and chronic conditions, and of key demographic determinants can be validated in special subsamples. Key indicator conditions in the study enabled measures of perceived need to be related to standard estimates.²

There is a need to develop similar and other types of population-based data using health assessors, informants, rapporteurs, or intelligence gatherers, if not formal interviewers, who, using the tools of the sample survey, could broadly and rapidly catalogue the perceived needs of a whole area or region with sufficient accuracy for decision-making. Similar skills and methods are used, for example, in the forest industry and in agriculture to estimate lumber production and grain harvests, and in the catering and hotel industry to estimate food consumption by groups of differing composition. National health planning requires improvement in the techniques of rapid assessment and a rapid feedback to policy-makers.

There is much to be learned from the experience of the International Collaborative Study with measures of differing quality. Initial data collection systems cannot be equally sophisticated in all the countries of the world. When the emphasis is on scarce resources in the face of immense and increasing need, planning must be based upon such simple available data as are appropriate to the particular conditions of a country’s development. Later, attempts should be made to improve the reporting. Still later, administrative data systems become an appropriate investment of development capital;

² These used were related to heart disease, bronchitis, arthritis, and anxiety, which would be inappropriate in some countries but could be replaced by others.
speed of the response and mechanisms providing early warning of inefficiency become the prime concern; usefulness for day-to-day management becomes the principal justification for the investment. Data must not be collected for their own sake, and the data-gatherers will have to gain experience in summarizing and presenting data that attempt to answer questions as yet unasked by the policy-makers. The development of an information system that produces usable intelligence involves creative interaction between the data technicians and the data users, and both will need some appreciation of epidemiological principles and of population orientation.\(^1\) The study made a modest contribution precisely to this type of interaction.

The present report has examined a number of planning strategies that can be used by a planner with both a survey of need and use at his disposal and statistics on the resources available. For example, the following types of problems were highlighted in Chapter 4:

- A low level of demand for health services in relationship to perceived need for care (e.g., postponement of care because of financial barriers or transportation difficulties) or to medically defined need (e.g., failure to seek useful immunizations)
- A low level of use of health services in relationship to expressed demand because of an insufficient supply of the services needed (e.g., a region’s failure to rehabilitate patients fully because of inadequate home care services, or delay in the provision of elective surgery that would improve the individual’s functional capacity)
- A high level of use of health services in relationship to medically defined need as a result of patient-initiated demand (e.g., a high level of use of specialist, outpatient, or emergency services rather than of general and primary care services, or of non-prescribed medicines)
- A high level of use of health services as a result of derived, i.e., physician-initiated, demand (e.g., a high level of use of prescribed medicines, hospitals and laboratories, and specialist and other health care personnel services as a result of referral by a physician).

These concepts—perceived need and medically defined need, individual expressed demand, and physician-initiated (derived) demand—require models of data-gathering similar to those used in the International Collaborative Study. The analysis of the data, however unsophisticated they may be, has important planning implications, for the concepts are appropriate in answering the simple planning questions reviewed in this chapter. They permit evaluation of the

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system, and this should bring about an improvement in the quality of answers to the elementary, but fundamental, questions asked by those who allocate resources.

**SOME CONCEPTS OF HEALTH INFORMATION SYSTEMS**

In the International Collaborative Study the comparability of indicators throughout the study areas in the different countries was one of the main prerequisites for drawing valid conclusions. Some basic lessons learned in that context can be considered to be generally relevant to the use of information in planning for better health.

**Distinction between data, information, and intelligence**

There is more than a subtle semantic difference between "data", "information", and "intelligence". **Data** consist of isolated or independent observations of attributes or events that carry little meaning when considered alone; data as collected from operating health care systems or institutions are inadequate for planning. The aggregation of data over time, space, and populations, and in the context of decisions that can or should be made, constitutes **information** for the planner, manager, and evaluator. It is the transformation of information through integration with experience and perceptions based on social and political values as well as on constraints that produces **intelligence**, an aggregation of internalized knowledge that provides the context in which policy-makers, politicians, and decision-makers act.

Unless data are refined and expressed as information that can in turn be used as a basis for intelligence, they are unlikely to influence choices; and unless in choices the potential value of judiciously acquired usable data is recognized, the choices are unlikely to reflect accurately the functional and practical relationships between needs, resources, and use. Some of the profiles and concepts reported in earlier chapters illustrate how survey and resource data can be displayed to help policy discussions.

**Need for balance between the degree of sophistication of the information and that of the planning process**

Better use of available data and information should be emphasized rather than increased investment in sophisticated health information systems. The level of sophistication in planning presupposes a similarly sophisticated level of health information systems; the choice of degree of sophistication in planning, therefore, must take into account the characteristics of the country and the resources it can
divert to health information. Indeed, the art and science of "estimation" needs to be more widely developed, always bearing in mind that it is better to be roughly right than precisely and elaborately wrong.

Need for uniform terms, definitions, and classifications

In order to examine the validity and utility of a general model for understanding health care organizations and systems that envisages sensing devices (yielding statistics and survey data) and feedback mechanisms (providing information and intelligence), it is essential to employ uniform terms, definitions, and classifications in the acquisition of data. Hence the emphasis on strict comparability throughout the International Collaborative Study and the use of identical methods by all the participating study areas, whether in the same or in different countries.

Recognition that data based on censuses or surveys and data derived from the operation of service programmes or insurance plans must be compatible is indispensable for designing any health information system. The former are derived from administrative and research sources, the latter from sources responsible for the provision of services or their financing; all need demographic, personal and, where indicated, clinical information that can be linked over time and space and to general populations. Survey and census information is especially important because it usually includes data on both users and non-users of services and on those with and those without perceived or professionally defined needs. Operation, service, programme, and insurance data are usually restricted to those who demand or use services. Evaluation of a health care system requires coordinated information so that the impact of services on needs, the extent to which they are responsive to needs, the extent of progress in the development of services, and the status of local and national financial accounts for the health services produced can be assessed.

These are counsels of perfection, but so was the notion of an international classification of diseases when it was first broached. Experience in the International Collaborative Study shows that local, national, and international comparisons are indeed possible over time, space, and populations, and that uniform terms, definitions, and classifications can be applied consistently in a variety of different settings in different areas and countries. There is no intrinsic reason why this effort to acquire simple uniform data and create standards for comparable health information systems should not be developed further and extended rapidly by WHO and its Member countries.
CHAPTER 7

SUMMARY: SOME GUIDING PRINCIPLES IN HEALTH CARE PLANNING

Planning implies a recognition of the necessity or desirability of change. Health services are in fact changing, just as in populations, organizations, and governments awareness is changing of the needs, expectations, and dissatisfactions with the coverage, benefits, and costs of many of those services.

An assumption in the International Collaborative Study was that each contemporary health care system was initially a response by decision-makers to a desire to achieve a measure of balance within the system under pressures for change. These pressures as well as the answers originated in the social and political realities of the area or country; and the analysis in the study stressed that there is no one ideal or right system, for to import any system from one country to another would also require that much of the history and traditions of the country be imported also. Nevertheless, it has become increasingly clear from the study that it is possible to derive guiding principles that could assist decision-makers in selecting optimum arrangements to fit their own circumstances.

The present work does not recommend or even set forth the components of any ideal system; nor does it make any claims to originality. Instead, drawing largely on the underlying assumptions of the International Collaborative Study, as well as on the models employed and the experience of the investigators, it proposes some guiding principles for planning change in health care systems that draw support from the empirical findings of the study. Since the approaches have proved useful to the investigators in their own
countries, it seems worth while to summarize them as possible guiding principles warranting wider consideration and testing in practical settings.

A population-based approach to health and health care planning

This approach emphasizes the concept of an appropriate population base or denominator for any measurement. The population represents not only the political base of perceived need, to which all politicians and all social services must sooner or later be responsive and accountable, but also the only scientific base usable by the planner to evaluate and compare health care systems objectively in time and space and among different populations. A population base, in contrast to an institutional, disease, or diagnostic base (all essentially derived from “numerator” data obtained only from the users of services and excluding non-users and many underusers), is absolutely necessary for objective planning and evaluation.

Epidemiology and sociology as fundamental planning sciences

It is unlikely that there can be effective progress in health or health care planning or in the design of health information systems for planning until the concepts of epidemiology and sociology (together with their intellectual cousins, demography and social statistics) are much more widely appreciated and used. Their principles and methods should be taught as part of the fundamental sciences in all institutions that educate health personnel. This need seems especially urgent in the medical schools of the world as well as in schools of health administration. All talk of national health and health care planning is illusory, if not counterproductive, in the absence of an epidemiological contribution, just as talk of vaccination against measles would be futile in the absence of a biological contribution. Similarly, a sociological view of the behaviour of individuals and populations is essential if their perceptions of and responses to health and health services are to be predicted and explained to health policymakers.

Indicators and proxy measures

The fact that not all attributes or events can be measured with equal precision is no reason for planners to neglect making an effort to estimate and assess those that are important and are key factors for a plan of action. Nor is there any reason to restrict attention to those indicators susceptible of exact measurement. Indeed, the
precise measurement of all professionally determined needs for medical care in a community is neither operationally feasible nor necessarily socially desirable, even apart from its unthinkable cost. On the other hand, rough estimates of perceived need, its severity, and what people usually do or would like to do about it, are feasible and highly relevant in both developed and developing countries when based on periodic sample surveys using health assessors, informants, rapporteurs, intelligence gatherers, or interviewers. Such measures as indicators, proxies, markers, and tracers that guide and inform are needed as a start for planning in most settings.

*Balance as an approach to health and health care planning*

The concept of a balance of needs, resources, and use implies that there are no ideal ways of providing health care; instead, there are choices that the planner and politician have to make in allocating resources to meet needs. If use of one modality, level, or type of care appears excessive in relationship to its benefits or costs or the available manpower, another modality should be considered and tested for cost-benefit. If unmet needs exist that are not being to some extent satisfied by the resources available, new or different combinations of manpower and facilities can be tried. The perceived needs of populations change over time and in relationship to social changes, just as the scientific and technological capacity of medicine to intervene efficaciously changes; a new balance between needs, resources, and use has to be struck at regular intervals. The concept of balance is central to the approaches to health and health care planning derived from the International Collaborative Study.

*The holistic approach to health and health care planning*

A holistic approach is variously described as a unified or multi-sectoral approach. It conceives of health as the essence of productive life and not, to put the extreme case, as the result of ever-increasing expenditure on medical care. All sectors of society have an effect on health and, as a consequence, on health care planning. Planners who concentrate on specific programmes and on projects unrelated to health and social services as more broadly conceived may be as apt to distort as to advance the achievement of desired goals for improving health. Both counterproductivity and harmful side-effects are distinct possibilities whenever a holistic approach is not employed in health planning; there may be misallocation of scarce resources and the duplication of costly services at the expense of others of equal or greater benefit. Although the International Collaborative Study did
not provide data directly relevant to this approach, the approach guided the work of investigators and was taken into account in drawing conclusions from the results.

Substitution between other sectors and the health sector

A holistic approach implies the substitutability of sectors other than health care in improving the health status of populations. Agricultural development, nutrition, housing, education, the production of other useful goods and services, improved communications, recreation, the control through import restrictions and taxation and licensing of activities and goods counterproductive to health are among the more obvious fields in which an approach can be made to providing substitutes for health services so as to increase the benefits, lower the costs, or cause fewer adverse side-effects, or all three. In general, the health status of the population is most likely to be enhanced when the health sector and other sectors are developed concurrently in a balanced fashion.

Substitution within the health sector in relationship to effectiveness

The potentials and limitations of substitution within the health sector are not widely appreciated by health care planners and health professionals. Substitution decisions usually require organizational planning at the systems level to make them acceptable to the individual providers and recipients of services and to improve overall effectiveness in the use of the services. In primary care, for instance, a front-line health worker or nurse may be able to do some of the tasks of a primary care physician. Also, an infirmary type of bed in a health centre may be a suitable substitute for an intensive-care bed in a large hospital. These examples imply that the choices are between more or less suitable, more or less beneficial, and more or less expensive solutions. Choices can involve substitution of one type of manpower for another or even the allocation of other resources, as well as doing more or less of what is being done currently.

Productivity in relationship to efficiency

Increasing the efficiency and/or productivity with which personnel, facilities, or services operate when the outcomes of their efforts are not clearly beneficial to the target population is of little value other than in providing employment, and is likely to be expensive. To automate screening or laboratory tests for health problems that have
no solutions is not a useful exercise. Nor does a preoccupation with labour-saving devices appear to be justified where manpower is relatively inexpensive and easily available. The object is to seek not a wider application of any efficacious method of intervention that has been developed but rather more effective and efficient methods of solving important health problems or providing beneficial services for large numbers of people. All measures of productivity and efficiency should be thought of essentially in terms of the cost and development of the available resources. They should also be considered in the context of outcome measures that reflect the impact of services on the health status of populations.

**Effectiveness in relationship to target groups**

The task of the planner for health and health care is to find the best solution in relationship to costs and benefits for all those in all the target groups (e.g., children, migratory groups, the aged, productive workers, or nursing mothers) or for all the groups considered to have a social priority. A proper evaluation of what is achieved will involve the use of methods that assess the extent to which all who can or should benefit do in fact benefit.

**Efficacy in relationship to benefit**

Except in relation to research, there is little to be said for, and there can be many counterproductive effects from, permitting, paying for, or advocating administrative or clinical interventions—whether preventive, diagnostic, curative, or restorative—for which objective evidence of benefit is lacking, as compared either with other forms of intervention or with doing nothing. Judgements about the relative utility of all action said to be useful in promoting health need to be subjected to epidemiological and scientific scrutiny.

**Appropriateness of services**

Health services need to be appropriate to the circumstances. Hazardous and expensive tests are inappropriate for a common symptom such as sporadic headache for which the risk of a serious outcome is extremely low without treatment. On the other hand, intramuscular antibiotics for a person living in an inaccessible area who has a serious fever commonly associated with bacterial infection would appear to be an inexpensive solution in the face of the high risk of a debilitating illness or worse. The solutions in one country or area, at one level of care or one type of facility, or for one kind
of problem are not valid for all settings and for all problems. Inappropriate solutions may involve both unacceptable costs and undesirable outcomes.

*Adequacy and acceptability of services*

The solution should be adequate to the need and in relationship to the overall needs of the entire population, including all the target groups. A solution for one group should not be at the expense of other groups. Thus the solution within a health care system should both be and be seen to be adequate and equitable, in the sense that it should be acceptable to all the people. The criteria by which judgements about adequacy and acceptability are made are distribu-
tional equity and social justice; these are in large measure value judgements and involve political decisions but it is the task of the health planner to take them into account as he balances the components of a health care system. A pragmatic method of assessing the extent of distributional equity and social justice among population groups is provided by the population survey technique used in the International Collaborative Study.

*Strategy and tactics*

Much health and health care planning has been preoccupied with tactical minutiae at the expense of overall strategic thinking. Plans are made for training new types of health care manpower or for designing new laboratories, with no consideration being given to what each is to do, whether it meets a perceived need, or how it is to be related to other modalities of care. Health and health care planning, particularly with respect to resource allocation, is much more a matter of strategy than of tactics; what to do should take precedence over how to do it.

*Ends and means*

A clear ordering of the objectives of a health care system provides a guide to the planning of solutions. Every major objective can be thought of in terms of a set of immediate objectives that are a series of necessary steps towards achieving that major objective. If imme-
diate objectives are properly formulated and carefully planned, the allocation of resources and the implementation of measures will probably be effective, as immediate objectives are usually more realistic and more easily attainable within a specified time than are higher-level objectives.
Area planning in the context of local, country, and international planning

The creation of health care systems based on assessment of perceived need requires the use of epidemiological concepts and methods. Suitable travel times for potential patients, families, and health care personnel and appropriate combinations of personnel and facilities are two determinants of a sensibly planned system. The location, composition, and balance of the system should be based on the distribution of the health problems, which are determined by the local conditions.

A relevant concept here is of modules of population size. In general, relatively small population groups (2000-30 000 persons) generate large numbers of common problems requiring primary health care; larger population groups (200 000-500 000 persons) generate in addition enough difficult and more severe problems to warrant the provision of secondary, or specialist, care; and large population groups (500 000-1 000 000 persons) generate enough still more complex or serious illnesses to warrant the provision of tertiary care involving superspecialists and technologically intensive facilities. The first level is supported by the other 2, and all 3 require to be connected by adequate transport and communication systems. Indeed, where national populations are relatively small or resources scarce, international cooperation in sharing and developing expensive resources and skilled manpower seems also to be desirable.

A balanced health care system requires a full appreciation both of the epidemiological basis of these 3 different levels of problem and of the social, scientific, and technological basis for the 3 levels of care. Planning requires appropriate combinations of personnel and facilities at all 3 levels of care in order to meet the needs of most of the population most of the time in the least costly manner; otherwise the system will be unbalanced with respect to the coverage, benefit, or costs, or to all 3. Imbalance at the level of tertiary care is as dangerous as it is at the level of primary care. But a balance at all levels requires the commitment of resources from sectors other than the health sector. Without adequate transport or communication, for instance, some imbalance in the health sector is inevitable.

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The International Collaborative Study on which this report is based shows that epidemiological and statistical population survey methods
can provide essential information about health care systems not available from other sources. These methods have been shown to be applicable in industrialized societies, in metropolitan, urban, and rural areas, in those with large as well as with small populations, and those with relatively sophisticated health information systems as well as in those where the health and statistical infrastructures are relatively modest. Both the concepts and the methods are suited to the needs of developed and developing countries, since the emphasis is on problems and concepts and the questions to be asked and answered in the context of appropriate population-based information rather than on large-scale health information systems based on medical records. The latter have limited utility in any context, and in most countries they are unlikely to appear for several decades in forms that are clearly related to the needs of those who allocate resources and plan, manage, and evaluate health services.

All decision-making, choices, priorities, and resource allocation in countrywide health planning should include sociopolitical components. The planning should be supported by health information systems that provide intelligence about needs, resources, and use as part of a dynamic planning process. In this sense, the International Collaborative Study has sought to foster instructive thinking about the problems of fitting the health services to the people's needs, both at the individual and at the community or societal level of decision-making.
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