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ANALYSIS OF HEALTH SERVICES SYSTEMS - A GENERAL APPROACH

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In every country there is a system of health services, just as there are systems of education, of agriculture, transportation, and many other social activities. The health service system is devoted primarily to protecting and improving the health of the population by the provision of a great variety of preventive and therapeutic services; it also has many secondary purposes, such as providing employment or generating profits, which we cannot discuss here.

The Scope of Health Service Systems

To define health service systems in this way - as a social activity for the provision of health services - is not at all to imply that health services are the only or even the major determinant of an individual's or a population's health. Socially oriented physicians and others have recognized for centuries that the health of people is influenced by the food they eat, the work they do, the knowledge they acquire, and much more. Nutrition, occupation, education and other physical and social factors, furthermore, are mediated in their influence on health by the biological traits of individuals. Hence a model on the determinants of health would look something like Figure 1. I have purposely not tried to show the magnitude of the various influences, because this is really not known in any generalized sense. Modern epidemiologists are struggling with this large problem mainly on a disease-by-disease basis.

Our focus in this conference, then, is on the block in Figure 1 identified as the 'health service system'. As we shall see, whatever may be its actual influence on the health of people,

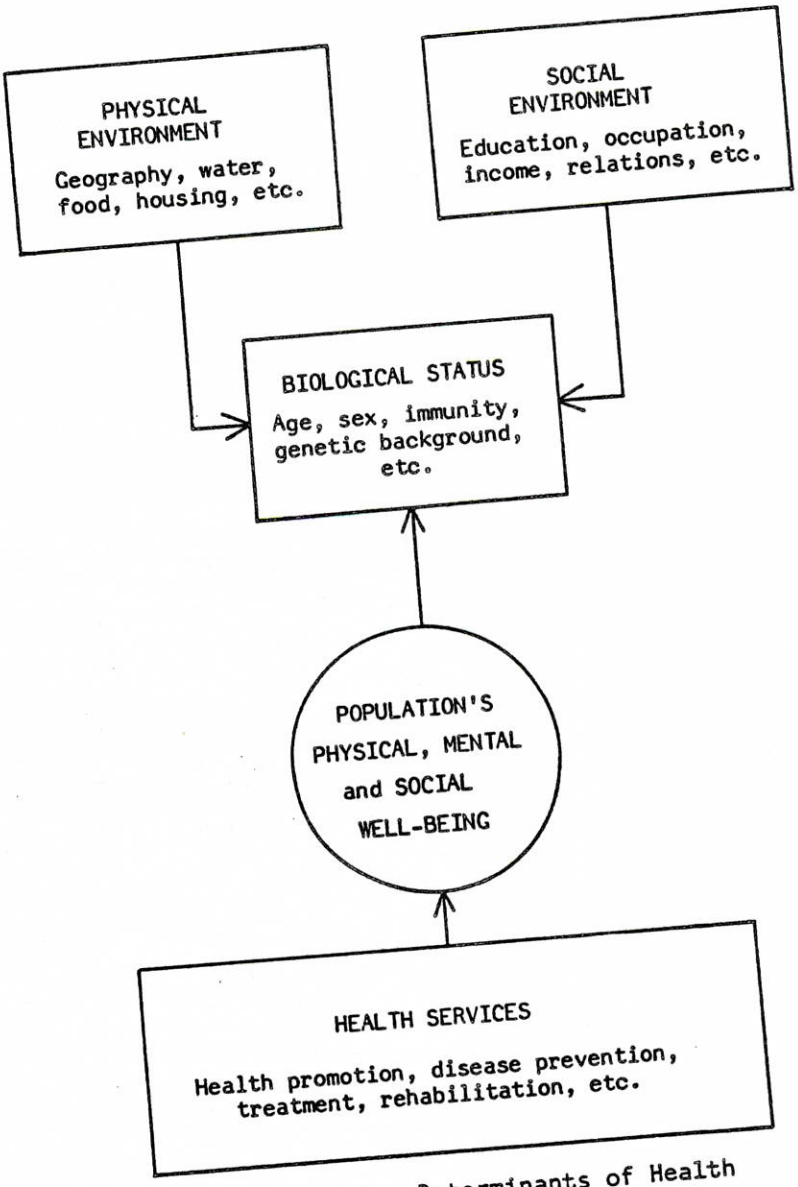

Figure 1. Determinants of Health

men and women everywhere and throughout human history have behaved as though they believed that health services were an important determinant of health. In this belief, every known society has taken actions to cope with disease or injury, to regain health, and in more recent times to prevent disease and promote health.

The precise ways that this has been done have differed enormously. In the current era of nation states, the complex of healthseeking activities in each nation has resulted in a national health service system. With the different economic, political, cultural, geographic, and social settings of nations, their health service systems are naturally very diverse. They vary enormously in the details of their structure and function, and hence in their overall complexity. Whatever their degree of complexity, and whatever may be their efficiency, coherence, or sense of purpose in providing health services, the activities in a nation devoted primarily to achieving health may be defined as a national health service system.

Evolution of Health Service Systems

The current contours of health service systems have inevitably been influenced by the major historical developments of science and of society. The steady extension of mankind's knowledge and control over nature has obviously been a major force determining not only medical science and clinical medicine but also many aspects of health service systems; consider the importance of bacteriology to the development of preventive public health programmes or the importance of organ pathology and surgery to the development of hospitals. Outside of the natural sciences, the evolution of economic orders or methods of exchange of goods and services have had as great or greater impacts on the shape of health service systems in the world today. I refer principally to the rise of capitalist and entrepreneurial economic orders over the last two or three centuries.

With the decline of feudalism and the rise of free trade, medical care became one of many commodities and services sold in the market. This process of exchange initially had distinct benefits in many settings. By providing physicians, apothecaries, and others with a source of income, it attracted many gifted persons into these callings and gave them incentives to work diligently. It also provided health services for many people in the newly developed cities, people who lacked the protection of being part of a feudal estate. The growth of science and universities also led to the great expansion of knowledge and skills in the practitioners of the 'healing arts'.

As industry grew, however, and with it democratic and parliamentary forms of government took shape, the concept of health service as a civic or public responsibility also developed. This conception led to consequences in the domain of health services quite different from those associated with the process of free trade. Instead of expecting health services to be bought and sold in a marketplace, mechanisms were developed to provide health care to people on the basis of their human needs and in the interests of general community welfare. These trends were implemented through the founding and operation of hospitals for the poor (later for everyone), the rise of the public health movement, the organization of health insurance programmes, and many other strategies for extending health services to general populations.

Over the last century (i.e. since about 1880) these two concepts of health services have developed side by side. The conflict of values, however, between health care as a market commodity and health care as a social service or even a basic human right has become more and more manifest. With the birth of the World Health Organization and the rise of many equivalent movements in almost all countries, the concept of health care as a right has gained ascendency. Accordingly, complete dependence of health care on market transactions in the private sector is now widely regarded as leading to social inequities and serious deficiencies in health service systems. For these reasons most countries have intervened with freedom of the market place by developing various kinds of collective financing and regulated provision of health service. The degree of this intervention has increased generally over time almost everywhere, but the manner and details of its application have obviously varied greatly. These variations have influenced all component parts of health service systems and, in large part, determine the characteristics of the national systems.

Components of National Health Service Systems

What then are the components of health service systems? Simplistically, they are the many activities that lie behind, that support, and arrange for the delivery of health services to people. But exactly what is a health service? Bed care in a hospital is clearly a health service, but what about care of an elderly person in a custodial institution? Vitamin therapy of a child with rickets is surely a health service, but what about a subsidized lunch programme for all school children? The custodial institution for the aged and the school lunch programme obviously influence the health of people but, unlike the hospital care, this is not their primary purpose.

A health service, therefore, can be best defined as an activity whose primary objective is health - its maintenance, its improvement or, if lost, its recovery.

Even with this restricted definition of a health service, health service systems are complex affairs, requiring many relationships among their component parts. In a very simplified form, these parts consist of (1) development of resources, (2) organization of programmes, (3) economic support, (4) management, and (5) delivery of health services. The principal relationships among these components are shown in Figure 2. If one proceeded no further than this Figure 2 model, I believe that it would still define correctly the health service system of every country in the world. Within each of the component blocks, however, there are many structures and processes or, if you prefer, subsystems and sub-sub-systems which define the realities in each nation. The highlights of each of the five system components may be briefly considered.

Development of Resources. Essential for the provision of health services are numerous types of human and physical resources. In their simplest form these consist of: (a) manpower, (b) facilities, (c) commodities, and (d) knowledge. The production or development of these resources requires inputs from various other social systems: education, construction, manufacturing, and so on - which we cannot explore here. It may be noted that financing or money is not regarded as a resource; it is rather a medium of exchange convertible into resources and services, as noted below.

Health manpower includes physicians, healers, and a variety of other personnel in all countries. Their formal or informal training, their precise functions, their work settings, their inter-relationships, their regulation differ widely among health service systems. Their number and ratio's to population, their geographic distribution, and their qualitative level of performance influence substantially the effectiveness of the health service system in a country.

Health facilities are also of many types. Historically oldest are hospitals for the diagnosis and treatment of the seriously sick. Aside from general hospitals for most acute illnesses and injuries, there are special hospitals for more long-term mental illness, cancer, tuberculosis, etc. and for childbirths or the care of children. Of increasing importance in recent decades are facilities for the organized provision of ambulatory care - health centres, polyclinics, health posts, etc. Pharmacies, laboratories, and even private medical quarters must be counted among a system's health facilities.

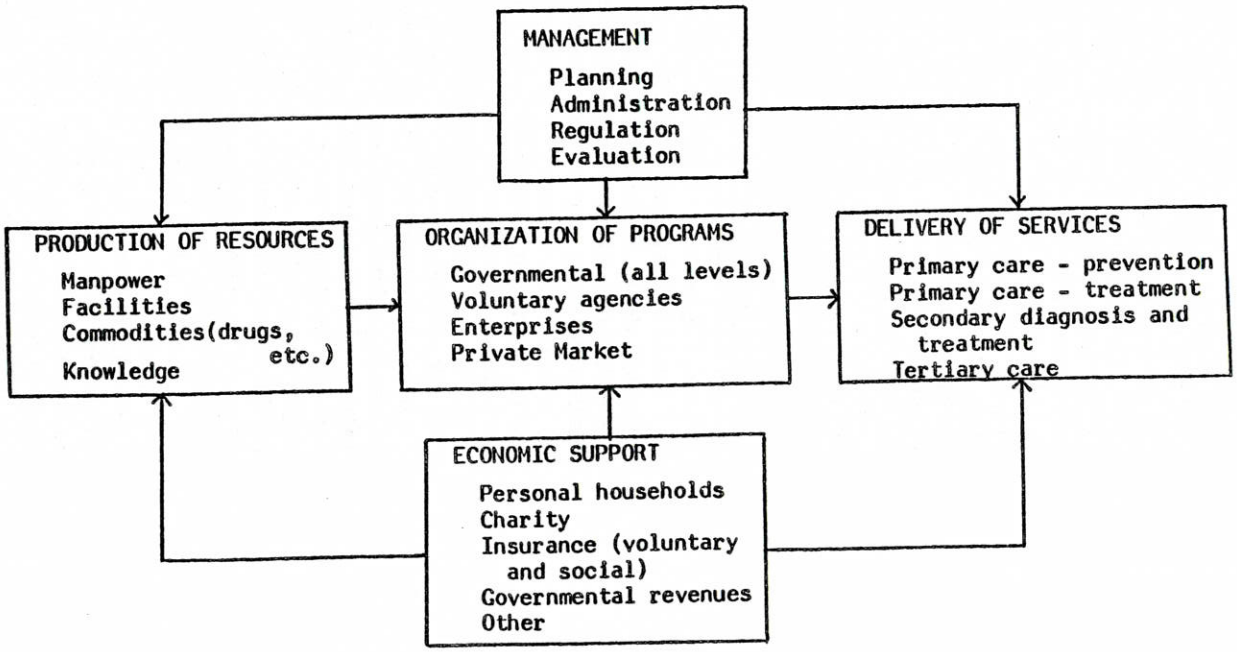

Figure 2. Health Services System - Structure, Relationships, and function

Health commodities are a third type of resource of mounting importance with advances in scientific technology. Best known are drugs and other therapeutic or even preventive substances - behind which stand world-wide industrial establishments. Over the centuries the types of drugs found in nature or synthetically produced have multiplied enormously, and have become matters of international trade involving virtually all countries. Their production, distribution and consumption involve all five components of health service systems. Similar dynamics apply to other commodities, such as diagnostic and therapeutic equipment, prosthetic devices, eyeglasses, wheelchairs, laboratory reagents, bandages, and much more.

Knowledge may not be conventionally regarded as a resource, but it is obviously basic to the operation of every health service system. Scientific knowledge is produced both by observation and experimental research, behind which are further human and technological requirements. Knowledge, like the other three types of resources must, of course, be applied in various ways to result in health services.

Organization of Programmes. The organization or arrangement of resources into various functional relationships or programmes towards certain ends constitutes the second main component of health service systems. The sponsorship of programmes may be governmental, voluntary non-profit, or entrepreneurial, and the proportions among these types are crucial determinants of the general nature of a health service system.

In the realm of government, health service programmes come under numerous agencies, best known of which is the ministry of health. Organized preventive health services are always a responsibility of the ministry, plus an increasing scope of other functions varying among countries. In most countries other governmental agencies are responsible for social insurance programmes financing medical care. Numerous other ministries may have functions for other aspects of the health service system, such as education of personnel, construction of health facilities, environmental controls, etc. Depending on the size (both population and geography) of a country, each ministry may have organized peripheral units at regional, provincial, and local levels, and these units may operate with varying degrees of autonomy.

Non-governmental and non-profit (often charitable) organizations in most countries develop and operate health programmes tackling certain diseases (such as tuberculosis or cancer) or serving certain types of population (such as children or the aged). Voluntary agencies may also operate health insurance programmes. Associations of health professional personnel often represent

their members in negotiations with government and they monitor ethical behaviour.

The entire private establishment for providing health services must be considered part of this component of health service systems. While not 'organized' in the usual sense, it functions through a market in which the services are bought and sold. The sellers include physicians, hospitals, pharmacists, etc. and they relate to buyers (patients) with varying degrees of competition or cooperation. Health services provided to workers by private industrial enterprises must also be considered in this private sector.

Economic support. Supporting all the development of health resources, and their organization into programmes, every health service system must have various sources of financing. I use the plural because in every country there is more than one source, and the proportions of money derived from each source determine many characteristics of the entire system.

In every country, private individuals or families are a source of economic support for health services, typically for treatment of personal disease. Donations to charity are another source, and this may take the form of donated labour as well as money. Non-governmental or voluntary health insurance is another source of great importance in certain countries.

Under government, general taxation is a source of support for resource development and health services in every nation. The exact types of taxes (on land, income, purchases, etc.) and the political levels at which they are collected vary widely, but everywhere tax funds are used for general prevention and for medical treatment of at least part of the population. Mandatory or social insurance is a special form of governmental taxation, in which the funds are earmarked for a specified purpose - such as medical care - and they are used only for the benefit of the persons contributing to the insurance fund and usually their families. In many developing countries, foreign aid or overseas charity may also furnish economic support to the health service system.

The mix or proportions of these several sources of economic support leads to policies which influence the nature of a health services system more decisively than any other system component. It is obvious that support derived from private individuals channels resources and services to those who have the money to spend, while support derived form general revenues can be used for services to others. The dynamics of economic support are, of course, very complex but they obviously have great implications for health care equity. On a world scale the proportion (not the amount) of health-related funds derived from private sources has been

declining and the proportion from public sources has been increasing.

Management. A second form of support for the operations of a health service system is management, which includes various types of social control - including planning, administration, regulation, and evaluation. Each of the processes may be carried out with various degrees of informality or rigor. Likewise all four of the elements of management may be in either the public or private sector.

Planning may be done at central or local levels of health service system or in various combinations of these levels. Its scope may also vary with the types of health activity affected, vis-à-vis free market operations. Administration includes several activities in system operations, such as the exercise of authority, delegation of responsibility, communications, coordination, and so on. Regulation is usually governmental but not always; it includes various legal and non-legal forms of surveillance intended to assure that system activities are in accord with certain standards. Most regulation has been established in response to abuses identified in the free market of health services, and to a lesser extent in the public arena.

Evaluation is a difficult process in any health service system, because it depends on a flow of information which may be difficult to arrange. This information should concern the development of resources, the organization of programmes, and the delivery of services. Arriving at sound judgements about the success or effectiveness of all these activities usually requires statistical data, which may be examined in relation to standards or objectives. In the absence of such data, evaluation may be based simply on general impressions of certain informed observers. By either method, evaluation provides feedback to the administration in a health service system, pointing to possible need for organizational changes.

Delivery of Services. Operation of the four components described in a health service system leads to the final component: delivery of services to people. These include all forms of health service: preventive, therapeutic, and rehabilitative. In terms of the complexity of the delivery process, the services are primary, secondary, and tertiary.

The types of personnel, facilities, and work setting for delivery of these services differ substantially among health service systems, particularly as between industrialized and developing countries. The differences are also great between the less organized and more organized types of system - the latter having health personnel in much more deliberately organized teams

for both hospital and ambulatory care. Within any one type of system, there may be several different patterns of health care delivery, particularly for selected population groups or diseases. Health services for military establishments, for example, are delivered through highly organized arrangements in all countries. On the other hand, aged and chronically ill patients may be served through diverse patterns in different countries, and also within the health service system of one country; similar diversity would apply to patterns of care for patients with mental illness, venereal disease, or tuberculosis. One pattern of delivery, however, is bound to predominate within each system type. The extent of deliberate relationships between and among primary, secondary and tertiary care, or regionalization, will also vary in different systems.

Determinants and Types of Health Service Systems

The combined characteristics of all five of the health service system components, just described, define the type of system found in each coutnry. In the approximately 160 countries of the world, no two systems are exactly alike, but one can understand them better by clustering the systems into certain major types. To do this, one must consider the basic determinants of the character of national health service systems.

My own observations suggest that the major influences are economic and political. In addition, there are always several other influences, which we may group under the heading of cultural.

Economic levels of countries can be quite readily scaled in terms of their gross national products (GNP) per capita. Although this index tells us nothing about the distribution of income in the country, it does describe national wealth. Countries with relatively high GNPs per capita are, of course, mainly industrialized, and those with low per capita GNPs are mainly agricultural. Deviations from those tendencies are seen in several petroleum-exporting countries, which have relatively high GNPs without being industrialized, at least currently.

The political characteristics of a country are not so easily identified and scaled. Although I have been searching United Nations and other international statistics for a clear indicator of political ideology - degree of centralized organization and control and/or degree of governmental (versus private) control of social affairs - I have not yet found one available for many countries. In its absence, therefore, I am proposing to scale national health services systems along a continuum describing the degree of organization of the systems themselves. With these two dimensions, each scaled into just three levels, we draw a matrix of health service systems, as shown in Figure 3.

Economic Level	Health Care Policies		
	Pluralistic (laissez faire)	Cooperative (welfare states)	Socialist (centrally planned)
Affluent (industrialized)	1. United States Australia	2. Norway Great Britain	3. Soviet Union Czechoslovakia
Moderate (developing)	4. Thailand Philippines	5. Peru Malaysia	6. Cuba North Korea
Poor (under-developed)	7. Ghana Nepal	8. Tanzania Sri Lanka	9. China Mozambique

Figure 3. Health Service Systems, Classified by National Economic Level and Health Care Policies

The cultural influences could be added to the analysis only by adding a third dimension to the matrix, or even a fourth and fifth dimension, which could be shown by multiple matrices. Under the cultural umbrella, one must consider a country's general technological development, which has obviously played a strong part historically. There are many impacts also from religion, community structure, family customs, and language. With sufficiently detailed consideration of all these influences, the world's 160 nations would probably yield 160 different types of health service systems.

With the relatively simple classification shown in Figure 3, the nine conceptual cells are probably sufficiently refined to provide useful understanding of how the main types of health service system work. In each of the nine cells, the names of two countries have been inserted as probable examples. In some of the cells, the systems of many countries would fall, and in others very few. My impression is that the most "populated" cells today are probably 2, 5 and 8. With respect to economic levels, the countries in the top row (cells 1, 2 and 3) have annual GNPs per capita of $ 3.000 or more; in the middle row this figure is between $400 and $3.000 (with the greatest clustering around $1.500); in the bottom row the annual GNPs per capita are under $400 (and principally under $300).

Time does not permit even a brief synopsis of the type of health service system in each of the cells of Figure 3, but a few remarks may be made about characteristics of the systems in each of the three vertical columns. In the first column (cells 1, 4 and 7), the private sector for delivery of ambulatory health care is quite strong. Expenditures for health service come predominantly from private families, rather than government. The resources (all four types), of course, are much lower in cell 4 than in cell 1, and lowest in cell 7. Most health care is delivered by individual practitioners (physicians, health auxiliaries, and traditional healers), rather than teams of personnel.

In the second column (cells 2, 5 and 8), a major proportion of the costs of health service has been collectivized through governmental mechanisms including social insurance. The great majority of hospital resources are in governmental facilities, and in most of these the doctors, along with other personnel, work on full-time salaries. In cell 5, the proportions of populations protected by social insurance are much smaller than in cell 2, but they are expanding. Central governments play a large role in health programme management, but a substantial role is played also by local goverments and local communities.

In the third column (cells 3, 6 and 9), the health service systems are almost entirely governmental. Virtually all resources are within the government, and health services are theoretically available to all residents without cost (except for small

charges made in cell 9). In cell 3, the central government exercises controls over all aspects of the system, with somewhat more local participation in cells 6 and 9. Preventive services are emphasized in all these systems, and their delivery is integrated with the treatment services.

Even these few highlights of the nine types of health service system are over-simplifications, but they may suggest some aspects for differentiation. If any action is to be taken to improve the health services of a country, in their quantity, their quality, or their equity, it is obvious that the strategy would have to differ in all nine types of system. One would have to take account, moreover, of not only the economic level and the degree of organization, but also of the religion, community structure, and other cultural features.

Trends

In a very general way, with some notable exceptions, national health service systems are evolving towards greater degrees of organization - that is, from the left to the right hand side of the Figure 3 matrix. This is seen in trends with respect to collectivized economic support, health care delivery patterns, policies of management, and in fact all components of health systems. To a lesser degree, there are also trends form the bottom to the top row of the matrix, as many (but certainly not all) countries undergo economic development. In health service systems, this is reflected most concretely by steady enlargement of health resources - ratio's to population of health personnel, hospital beds, and various types of health centre. The impacts of these trends are clearly reflected by world-wide improvements in life expectancy, infant mortality, and other indices of health. In the years between 1955 en 1975 the life expectancy at birth in the developed regions of the world increased from 64.3 to 70.3 years. Even in the much poorer developing regions, it increased from 42.5 to 53.2. The rates of these improvements are not the same, of course, in all countries, but the overall trends are still in a favourable direction. Changes in physical and social environments, of course, contribute importantly to these trends, but it is also clear that health services play a substantial part.

Returning to my opening remarks and Figure 1, the health status of populations depends on many influences beyond health services. Improvements in health, therefore, require progress in many sectors of society. One need not wait, however, for achievement of the enormous changes in a society, required for greatly improved housing, employment, education, etc., to expect significant gains in health. More effective and equitable health service systems can achieve better 'health for all', as WHO puts it, in a relatively short time.

FIGURE 1. Determinants of Health

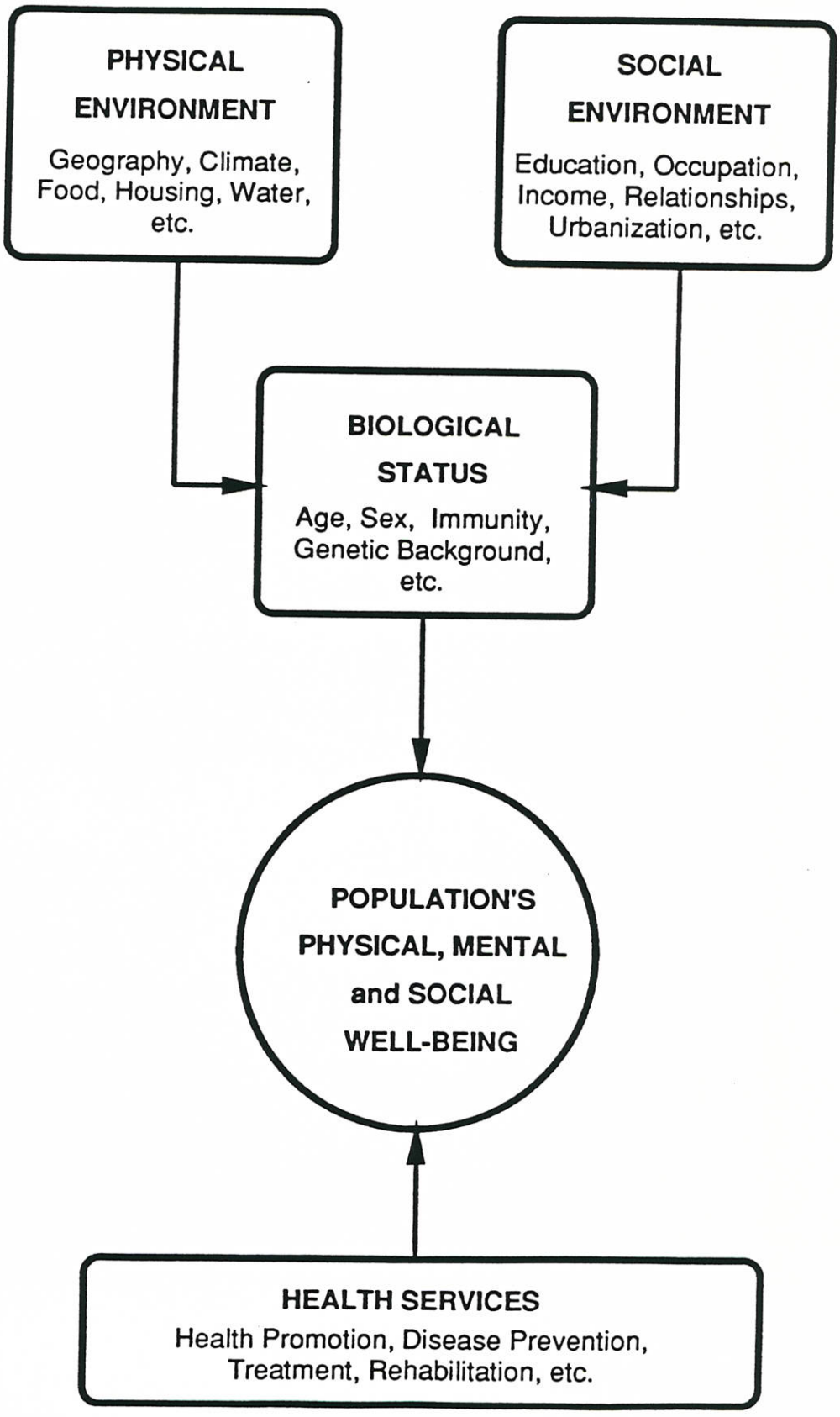

FIGURE 2. Model of a National Health System: Showing its Components & Their Relationships to Health Status

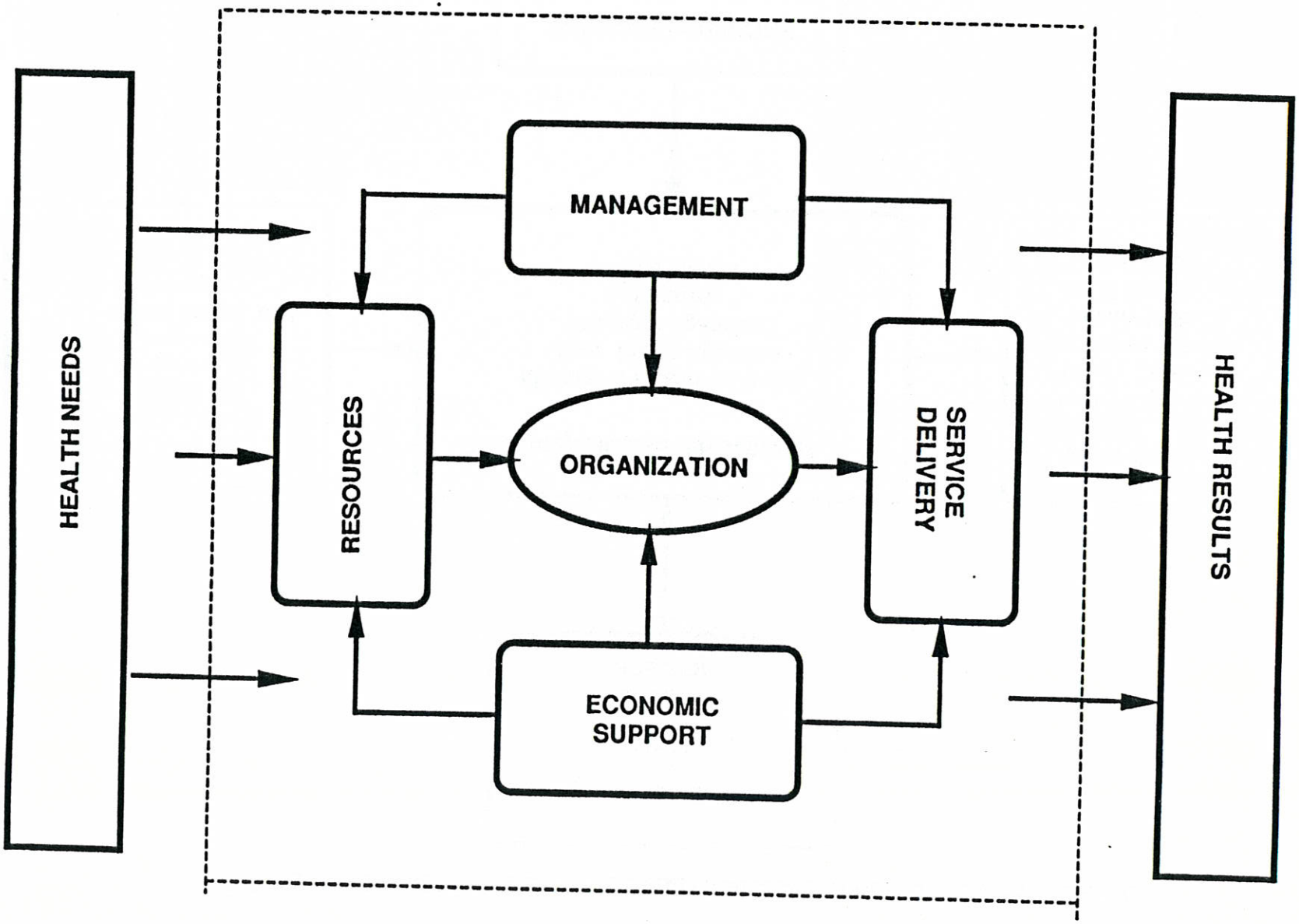

FIGURE 3. National Health System: Components, Functions, and Their Inter-dependence

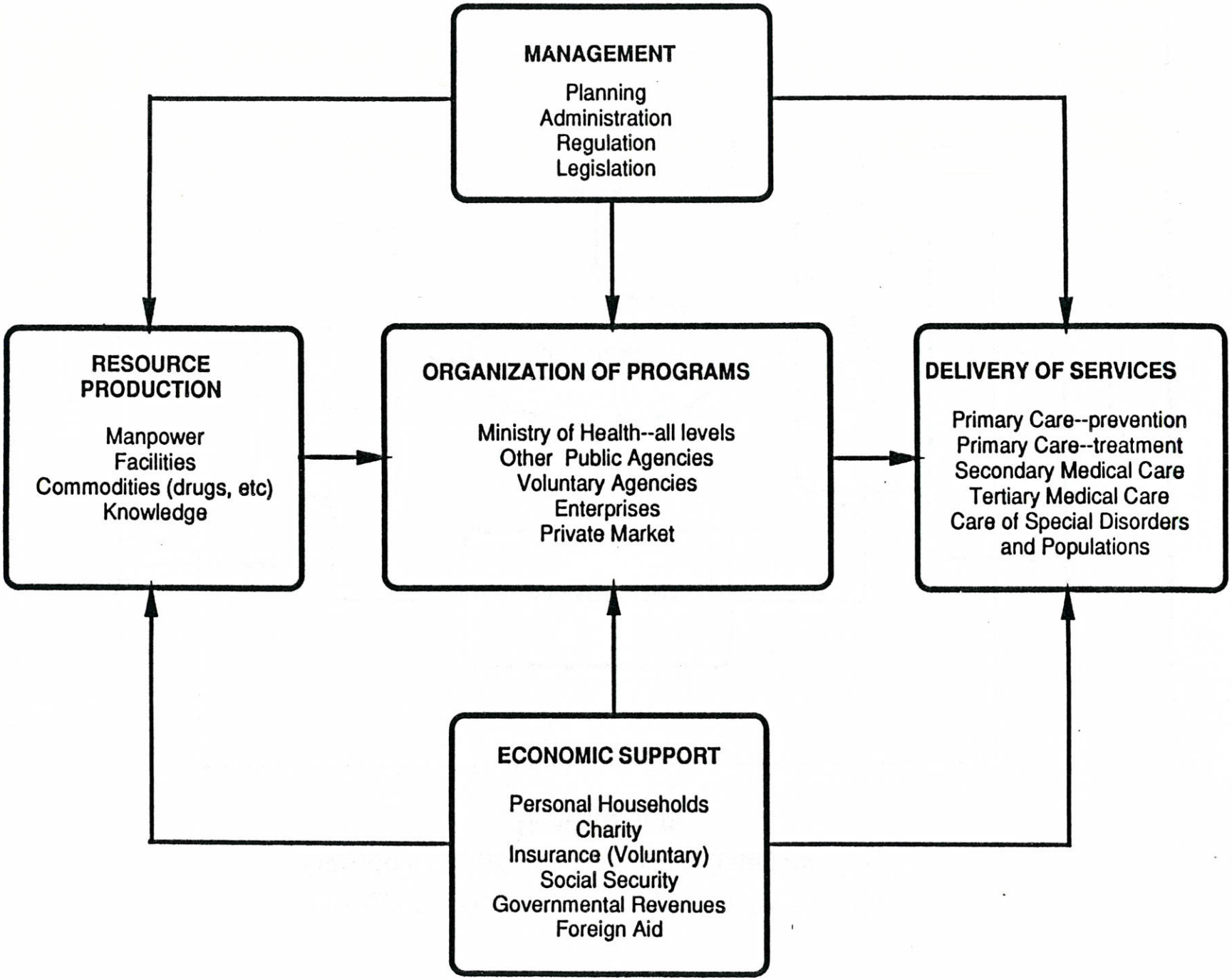

FIGURE 4. Types of National Health Systems: Classifed By Economic Level & Health System Policies

ECONOMIC LEVEL (GNP per Capita)	HEALTH SYSTEM POLICIES (Market Intervention)			
	Entrepreneurial & Permissive	Welfare-Oriented	Universal & Comprehensive	Socialist & Centrally Planned
Affluent & Industrialized	United States 1	West Germany Canada Japan 2	Great Britain New Zealand Norway 3	Soviet Union Czechoslovakia 4
Developing & Transitional	Thailand Philippines South Africa 5	Brazil Egypt Malaysia 6	Barbados Nicaragua 7	Cuba North Korea 8
Very Poor	Ghana Bangladesh Nepal 9	India Burma 10	Sri Lanka Tanzania 11	China 12
Resource - Rich	Gabon 13	Libya 14	Kuwait Saudi Arabia 15	16