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Baker, T.D.; Ferguson, D.C.E.; Hall, T.L.; Haynes, Alfred; Taylor, C.E.

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HEALTH MANPOWER PLANNING IN DEVELOPING NATIONS

This monograph was prepared by the following member of
The Johns Hopkins Division of International Health:

Dr. Timothy Baker
Dr. Donald Ferguson
Dr. Thomas Hall
Dr. Alfred Haynes
Dr. Carl Taylor

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PREFACE

The new emphasis on health manpower planning derives from two recent evolutionary emphases. It is perhaps the most important part of the comprehensive health planning which promises to provide a new orientation for health care in some countries. It is also part of general manpower planning which is increasingly recognized to be a primary requisite of planning for general economic development. Although the principles of planning can be readily discussed at the academic level, the working procedures are only slowly being worked out by planning commissions and health ministries. While most countries allocate major resources to the development of health manpower, there is usually little planning or innovative thinking. It is easier to press for "more of the same." Some developing countries now recognize that their problems are too great to be solved with traditional and ad hoc measures. Gradually, also, in the United States, Canada, Russia and other developed countries, planning for health manpower has assumed a central role in planning for health.

In 1961 the Division of International Health of The Johns Hopkins University School of Hygiene and Public Health and the Agency for International Development (A.I.D.) agreed that field studies of health manpower planning were needed. It was realized that planning methodology must be improved, and its application demonstrated. To accomplish these goals, the Agency for International Development made a major grant to Johns Hopkins to set up health manpower studies in developing nations. This book presents a synthesis of what was learned about health manpower planning and the methods developed during five years of field research in four

countries. Separate monographs are being published under the sponsorship of the Agency for International Development that give the methods and findings of each of the country studies in health manpower planning.

The Agency for International Development's charge to Johns Hopkins was to select countries that were both suitable for development of health manpower planning methodology and could benefit directly from the results of health manpower studies. The countries selected were to include wide geographic representation as well as differences in levels of development. A primary criterion for selection was interest of the host country, a factor which in fact proved essential to the successful conclusion of the studies.

Three Latin American countries, Peru, Colombia and Bolivia were the first to express interest in collaborating with Johns Hopkins in a health manpower study. In the preliminary discussions with these countries we wish to acknowledge the valuable help given by A.I.D. health staff in helping us make the necessary contacts.

Largely due to the presence of a health planning unit within the Peruvian Ministry of Health, our choice for a Latin American country was Peru. In July of 1962 an American team consisting of Dr. Paul Wehrle, a pediatrician and public health physician, Dr. Tom E. Davis, an economist, and Dr. Schuyler Fonaroff, an anthropologist, arrived in Lima to begin the study. One month later, following political disturbances which led to a break in Peru-U.S. diplomatic relations, the study was suspended and the Americans returned home. One year later the study was re-started with the arrival of Dr. Thomas Hall as the full-time Hopkins investigator. During the remainder of the study Dr. Hall worked in close collaboration

with the Health Sector Planning Office of the Ministry of Health.

The principal Peruvian investigators were Drs. David Tejada de Rivero and Alejandro Sotelo B., past and present chiefs of the Planning Office, and Dr. Rubin de Celis, Mr. Jorge Salinas (sanitary engineer), and Mr. Marcial Aranguri (statistician), of the Planning Office staff.

While arrangements were being completed for the Peru study, preliminary negotiations were initiated in Taiwan by Dr. Abel Wolman, Professor of Sanitary Engineering, then in Taiwan on consultation. Professor Mark Perlman, now head of the Department of Economics at the U. of Pittsburgh, made the initial field visit for exploratory conferences with Taiwanese health officials. He was subsequently joined by Dr. Timothy Baker, public health physician, who became the principal American investigator in the Taiwan study.

The success of the project in Taiwan was primarily due to the splendid cooperation of the Health Section of the Joint Commission for Rural Reconstruction, the Provincial Health Department, and officials from the Agency for International Development in Taiwan. Dr. K. K. Chang served as administrator for the project, Dr. L. P. Chow, now Deputy Director of Health, Taiwan, made essential contributions to the initiation of the research project. Professor Kuo, economist and statistician, Miss P. Y. Chen, public health nurse, and Mr. J. F. Tsai, psychologist, were the other members of the research team. The study in Taiwan had had an initial delay because of the cholera epidemic which struck Taiwan in the summer of 1962. Field work proceeded during the next two years with the enthusiastic participation of Taiwanese officials.

Visits were made to the following countries in Africa: Ethiopia, Kenya, Uganda and Nigeria. In Nigeria the Health Minister expressed the particular interest of the Nigerian health sector. The Health Manpower Board of the Ministry of Planning had just completed an overall manpower analysis of professional and technical manpower. They were about to select a specific manpower sector for detailed study. Senior officials welcomed collaboration with Johns Hopkins on health manpower. Dean Thomas of the Lagos University Medical School also requested help in developing a Department of Community Health and Dr. Robert Wright went to Nigeria in 1963 to work on both projects. Only limited field studies were possible because of the complexities of relationships between the various Federal and Regional authorities. The data that were gathered could never be adequately analyzed because of growing political tensions and uncertainties.

To secure representation of a country in West Asia a series of visits were made following up expressions of interest from Pakistan, Iran and Turkey. In October 1963, arrangements were made to initiate research work in Turkey and both the Health Ministry and State Planning Organization agreed to provide local personnel and costs. Plans were just being developed for implementing a new nationalized health service in the rural areas of Anatolia and manpower shortages appeared particularly critical. The Turkish study began in the summer of 1964 with Johns Hopkins represented by Dr. Kurt Deuschle, public health physician and Professor of Community Medicine at the University of Kentucky, Dr. Carl Taylor, and Miss Alice Forman, a public health nurse-midwife. The chief Turkish counterparts were Dr. Necat Erder, a senior social scientist, and Dr. Rahmi Dirican of the faculty of the School of Public Health in Ankara.

Others who contributed to this study were Dr. Gulseren Gunce, psychiatrist, Mr. Kevan Somer, economist, Mrs. Sukriye Karaosmanoglu, nurse, and Mrs. Ayten Geray, nurse.

In conclusion we would like to specially thank Dr. S. C. Hsu, Chief of the Health Division of the Joint Commission of Rural Reconstruction, and Dr. T. C. Hsu, of the Taiwan Health Department and the public health nurse interviewers who did much of the field work.

In Turkey, our special thanks go to Dr. Nusret Fisek, previous Undersecretary of the Ministry of Health and other members of the Ministry, staff of the State Planning Office and members of the staff of the Ankara School of Public Health.

In Peru, our special thanks go to Dr. Carlos Quiros, Director General of Health, and to the entire staff of the Health Sector Planning Office of the Ministry of Health.

We also thank all those who assisted materially in the preparation of this document: Sue Flanigan, editorial assistant, Carol Buckley, Margaret Daneker, Kathleen Hill, Martha List, and Nancy Stephens. Without the help of these and many others our studies would never have been completed.

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Part I

INTRODUCTION

Chapter I

HEALTH MANPOWER: AN OVERVIEW

Objectives of Health Manpower Planning

Behind the recent thrust of interest in health manpower planning are two major forces: first, there is growing awareness that the uncontrolled spontaneous response to the manpower market has left major inequities in distribution of health services and gaps in provision of specific health functions; second, as a result of many preliminary studies and much practical experience there is recognition that such an uncontrolled situation is not necessary and that a whole new methodology of manpower planning is feasible. As the most important and most expensive component of health services, health manpower represents a particular challenge to the planner since it is always more difficult to plan people than facilities or other tangible resources.

Specific objectives of health manpower planning may be summarized as follows:

- (1) To obtain maximum productivity and effectiveness for the manpower resources available.

Planning is based on the assumption of scarcity. People always want more than they can get. Within the limitations of personnel who can be made available in any social system, therefore, it becomes necessary to work for maximum productivity applied to the highest priority health needs.

(2) To understand and where possible to control or adjust the spontaneous movement of supply/demand relationships. Society moves too fast in the modern day to permit the spontaneous cyclic adjustment of the supply-demand equation which occurred in a purely open market situation. By projecting trends of supply and defining the relevant forces behind them, it becomes possible to build in appropriate corrective mechanisms.

(3) To provide an educational system adequate to meet future needs for health personnel. Educational planning requires both quantitative and qualitative adjustments for the future.

(4) To establish mechanisms for continuing manpower surveillance and implementation of plans. Planning is a process not an event and unless it leads to implementation it is worse than worthless. This requires continuing activity of appropriately organized units in the health services to ensure the cyclic process of planning, implementation and evaluation leading to replanning.

Summary Generalizations About Health Manpower Planning

Definition of Health Service Policy. Society has no use for health manpower except as they provide health services. Therefore, no meaningful manpower planning can be done except in the context of total health service policy. This requires:

(1) Decision about what health tasks should be done - Goals.

- (2) Choice based on the relative importance of the health tasks -
Priorities.
- (3) Definition of the levels of quality which will be acceptable -
Standard Setting.

Measurement and Projection of Manpower Supply. Manpower analysis must start with measurement of existing supply and projection of trends. In most countries, data are so limited that this process is not only difficult but the results must be recognized to be approximate. A primary purpose of initial manpower studies should be to establish continuing mechanisms for registration and followup of personnel and provisions for periodic evaluation of manpower expansion.

Demand Analysis. Measurement and projection of demand for health services is one of the most difficult parts of manpower planning. Present projection systems based on population to personnel ratios are inadequate. Approaches that are worth considering are analyses of economic, social, demographic and institutional requirements, all of which can be combined under the general heading of "effective demand"--which includes the concept that this is what people will in fact be willing to use and pay for.

The Economics of Health Manpower. The most important determinants of the amount and kinds of health services provided are economic. To have adequate health planning it is necessary to coordinate resources. Manpower projections must be consistent with economic projections. In general, there are so many demands on public resources that public funds should not be used for anything that can be paid for in other ways. In

most cases this means that the public sector will assume primary responsibility for preventive services. In order to get comprehensive services there is need for some degree of general financial control.

Health Personnel as a Total Integrated System. Health manpower studies of only one category of personnel have little relevance to total health service requirements. Even though doctors dominate the decision making and organization of the health system, they can function efficiently only with an appropriate supporting staff of ancillary personnel. In the absence of deliberate planning, traditional work stereotypes become increasingly blurred. The personnel available to staff local services must be viewed as a functional totality and an appropriate local manpower mix must be determined. A health manpower pyramid is the goal, rather than the manpower hourglass now found in many developing countries.

Functional Categorization and Downward Delegation of Health Activities. Skilled manpower is society's most precious resource. Few economic sectors with as high a requirement for professional and technical expertise and skills are as labor-intensive as health. New approaches are needed to get functional categorization of all health activities in relation to priority goals. The clear definition of the quantitative and qualitative personnel requirements for each function then will permit a more rational manpower distribution. To achieve maximum efficiency the general procedure should be to delegate responsibility to the least expensive manpower level capable of maintaining an appropriate standard of quality. This means that in most countries far more attention must be paid to the role of ancillary personnel.

Improving Productivity. Health manpower resources can most readily and rapidly be increased by improving the productivity of all personnel available. In addition to the functional redistribution of activities to appropriate ancillary personnel in a team relationship referred to above, manpower productivity can be improved by such measures as: improving the use of facilities, introducing scientific advances which more effectively achieve control measures, concentrating on prevention, producing a better balance of ambulatory to inpatient medical care, etc.

Educational Planning. The second major method of increasing manpower resources is through improvement and expansion of the educational system. The only long term source of manpower is the educational institutions. If demand can be clearly projected then it should be possible to concentrate on preparing appropriate numbers of each category with due recognition of the great lag in producing professional manpower. Rather than merely opening new schools, the educational output of existing institutions can often be markedly improved by increasing the size of classes and reducing the dropouts and repeaters. An educational consideration which has received little attention is the need for more flexibility in adapting teaching programs to changing patterns of work. Most countries require a massive increase of ancillary training programs.

Regionalization, Supervision and Continuing Education. The pattern of health care which is increasingly being established for most of the world's people is a regionalization of facilities based on medical centers with various levels of peripheral units. The basic peripheral unit is most commonly a rural health center combining curative and preventive

functions. A major advantage of such regionalization is that it provides a framework for optimum utilization of personnel. In this process, continuing education is a vital supplement to supervision in ensuring high standards. The educational process should be built into regionalization with a constant two-way flow. Peripheral personnel should go into the central institutions for periodic courses. Specialists should regularly visit at the periphery to solve difficult problems and increase local competence and morale.

Personnel Redistribution to Adjust Rural/Urban, Geographic and Social Inequities. A major defect of most health services is the inequitable coverage provided various segments of the population. As nations accept the concept that minimal health services are a basic right, there are increasing pressures to achieve a better distribution of services. The lack of motivation of health personnel to serve in difficult situations or among some groups of people is an important factor in producing the present inequities. A particular need is to develop clearer understanding of these motivational problems and appropriate incentives to solve them. In manpower redistribution economic incentives are often the most effective.

Conceptualization of Health Manpower Planning

Health manpower planning has its logical base in the general methodology of planning for economic development. Many of the basic ideas and principles are derived from economics. A simple initial premise assumption is that manpower planning, like most economic studies, starts with the assumption of scarcity of resources and the need to develop

priority allocations. In almost every country chronic shortages of skilled and competent personnel and training facilities have forced growing attention to manpower planning.

In health work particularly, there is an underlying general recognition that oftentimes lack of services is due to lack of personnel. The health industry is more labor intensive than most major sectors of the economy and has a very high requirement of technical and scientific competence.

The first important conceptual distinction presented in this monograph is that the general scarcity of health services can be met in two ways. First, there is usually a basic need for increasing the number of particular kinds of personnel who can fulfill specified health functions. A major purpose of long range manpower planning is to identify impending shortages long enough before they occur to compensate for the lag period inherent in producing skilled manpower. The only organized resource for producing skilled manpower is the educational system. The second major approach to increasing the manpower input in health services is to increase the productivity of such personnel as may be available. There are many ways of increasing productivity and their discussion leads to a concern with most of the factors influencing the health industry. Some measures for increasing productivity can be applied in the short range planning period of the usual five year plan. Others require much longer to implement. In general, however, it seems reasonable to concentrate on maximizing productivity before moving on to the educational approach of modifying manpower gaps and shortages.

The basic economic analytic framework that is most useful in health manpower planning in a scarcity situation is that of the supply/demand equation. Throughout this volume data are categorized according to whether they contribute to an understanding of either supply or demand. Most manpower studies in the past have been largely limited to concern with the supply side of the equation with great energy and effort being expended in working out ways of measuring supply.

The demand side of the equation has received far less attention. The methodology of demand measurement is just beginning to be developed. The usual practice has been to take as norms or standards, personnel to population ratios which have developed spontaneously over time in various countries. Growing out of spontaneous open market adjustments, these ratios are accepted as more or less adequately meeting the general need. Even in Soviet planning the basic pattern has been to calculate average levels of manpower distribution and productivity on the assumption that this presumably is the best way of judging existing requirements. They have then focussed effort on bringing up to that norm those segments of society or manpower sectors which fall below the average.

Internationally, certain personnel/population ratios have come to be idealized as having a sort of magical quality of desirability. The fact that there is no rational basis for such physician to population ratios as 1 to 1,000 seems to have little bearing on the fact that these ratios have now acquired the glamour of an international status symbol. In health conferences national representatives openly compete in the use of such ratios to bolster national pride. Throughout this document we stress the conclusion that, for planning to be conducted rationally,

overall ratios are far less important than segmental analysis based on careful allocation of health functions by priorities and maximizing productivity. For a developing country, it should be a greater source of pride that a limited number of doctors are being used in an optimal balance with ancillary personnel rather than that the physician to population ratio has been artificially built up.

For planning educational resources the most important part of manpower analysis comes when the supply and demand figures are projected for appropriate intervals in the future. The assumptions and standards which are used in such projections must, of course, be clearly defined. At first, most efforts at projection will not be accurate and must be considered first approximations which require progressive refinement. As first approximations, however, these calculations are tremendously important in providing the basis for preliminary judgments about manpower shortages and gaps.

Supply Patterns. The first consideration in calculating supply is to relate it to the educational pool from which candidates can be recruited. The recruitment potential of any occupational group depends largely on historical, cultural and economic factors. At several points in this volume we refer to differences in manpower patterns that are determined by the developmental level of the country. In the development process the relevance of the general educational level is increasingly recognized. As long as Liberia has only some 400 high school graduates per year, competition among employment and educational opportunities will continue to be great. The total number of recruits for the health professions must continue to be limited until general education expands.

The multiple forces that influence recruitment include prestige due to historical tradition or transitory publicity, financial prospects, security, service motivation, government pressure, the availability of training, and especially in health work the important but almost totally unpredictable factors determining personal interest. Some of these forces are subject to social manipulation but others must be accepted as given.

Once the recruit is admitted to the educational process a sequential chain of career development starts which will be traced in a separate chapter. At this point it need only be stressed that education does not cease at the time of graduation from a teaching institution. The role of continuing education in manpower development becomes particularly relevant in the retraining required when the work of an occupational group is redefined or changed.

Increasing productivity has already been mentioned as being a primary means of improving health services. Usually, this is measured more in terms of such simple indices as total patients seen per unit of resources. More sophisticated indices are needed to record observed differences. A hierarchy of objectives can be defined ranging from the measurement of effort expended in performing specific tasks and activities to progress made in improving specified health indices in a population. At each level productivity is the ratio of output divided by input in manpower units per time interval. The output at each level can be considered the input at the next higher level of analysis. For instance, an input of manpower effort leads to an output of tasks or activities accomplished, these in turn produce an output of programs for disease

control in a population which then contribute to general improvement in health indices.

In a general discussion of the problems of increasing productivity, motivational considerations have primary importance. As discussed in chapter VII this group of factors is best viewed as a summation of multiple vectors of force. Motivation itself is not a discrete entity but the net effect of the attitudinal and psychological considerations which influence decisions. Some of the specific components are deeply ingrained and cannot be changed. Many more of them are labile and subject to manipulation by the adjustment of incentives. Net motivational change to be real should produce recognizable modifications of decision patterns and behavior. This can be seen most readily in the factors determining doctor distribution to rural areas and unattractive working conditions.

Involved in most of the other influences affecting manpower development and productivity are numerous administrative and organizational considerations. The organizational structure provides a framework for action which contributes to the effectiveness of individual performance. It has been said that a building is in itself a long range plan. Even more fixed and lasting than most buildings are the bureaucratic edifices which run health services. By establishing or changing an administrative pattern one is in fact implementing a long range plan. A major objective of the modern approach to health planning is to develop appropriate machinery within the administrative structure to apply corrective measures at optimum times. By learning how to project and predict the planner attempts to identify problems before they occur and then to build

appropriate remedies into the system.

Demand Patterns. Conceptualization of demand is more difficult than understanding supply. Part of the confusion about the notion of demand has arisen because of differences in the approaches of various disciplines. The basically economic concept of "effective demand" represents the net summation of what people are in fact willing to do in order to get what they want.

The components of demand can be grouped under four categories of factors each having its origin in a different disciplinary approach. A model has been constructed showing the four approaches as overlapping areas. The relative size and degree of overlap of each of these areas depends on local conditions within each society. An impressionistic sketch of the relationships between these four approaches has been prepared for countries at different stages of development (Figures 1-1 and 1-2).

The first area represents "biological need" or the personnel required to meet the total burden of ill health in a community as identified by professional workers. The concept is primarily epidemiological. It requires classical laboratory, clinical and field techniques to identify the total morbidity and disease distribution in a population. On the basis of professional judgment estimates are made of the services necessary to meet health needs. Calculations of numbers and distribution of manpower required can then be derived.

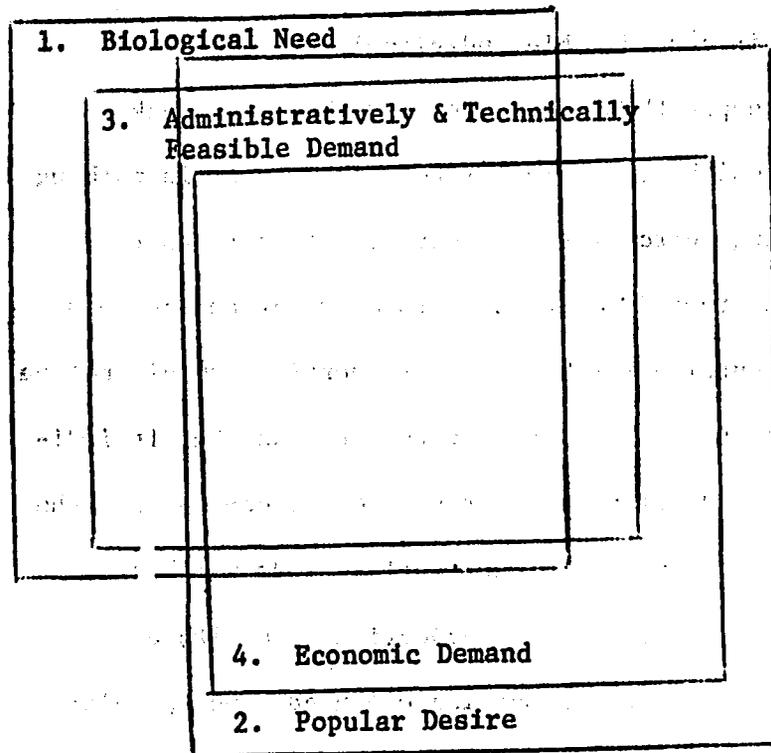
The second area has been labeled "popular desire." This represents primarily the social scientist's approach to determining what people think their health problems are. The fact that "popular desire"

only partially overlaps "biological need" indicates the obvious fact that in any group there is considerable individual and community hypochondriasis. When people think they are sick they will seek medical help. Even if health professionals tell them there is nothing wrong, in their continuing search for aid they will turn to faith healers and quacks. The tremendous investments of money and personnel in activities which are outside the usual health services should not be ignored in manpower planning if for no other reason than that it indicates unmet demand. It is difficult to get public cooperation for the support of health manpower required to meet health needs which only health professionals understand. A major objective of health education is to increase the congruence between "biological need" and "popular desire."

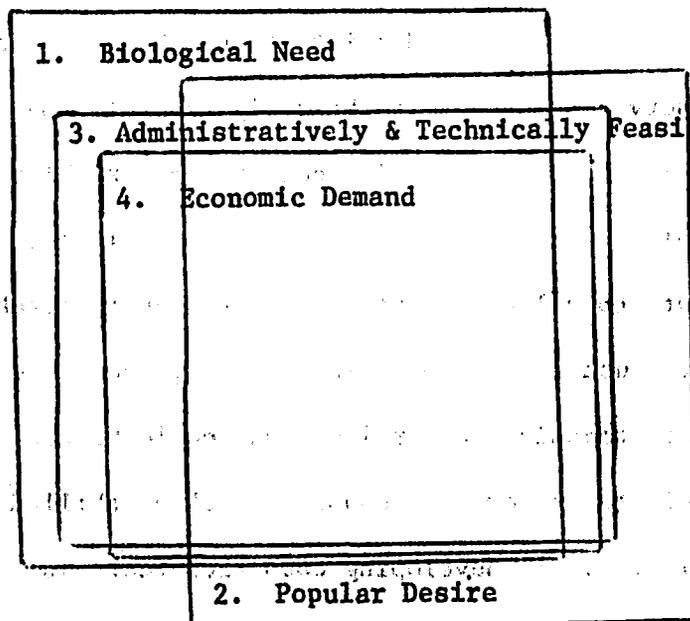
The third area represents "administratively and technically feasible demand." This determination of manpower requirement is based on the judgment of health professionals, particularly administrators. Manpower needs are estimated according to services that are technically feasible and administratively possible. There are many health conditions for which appropriate solutions or ameliorative measures are not yet available. It is presumably inappropriate to allocate anything other than research effort and palliative care to such conditions. In addition, there are many health problems for which technical control methods could be available but they remain difficult to implement because of lack of skilled personnel or technical facilities. In developing countries there is often also a problem of inaccessibility because of lack of transportation or social and cultural blocks. Perhaps the most common reason for the

Figure I-1.

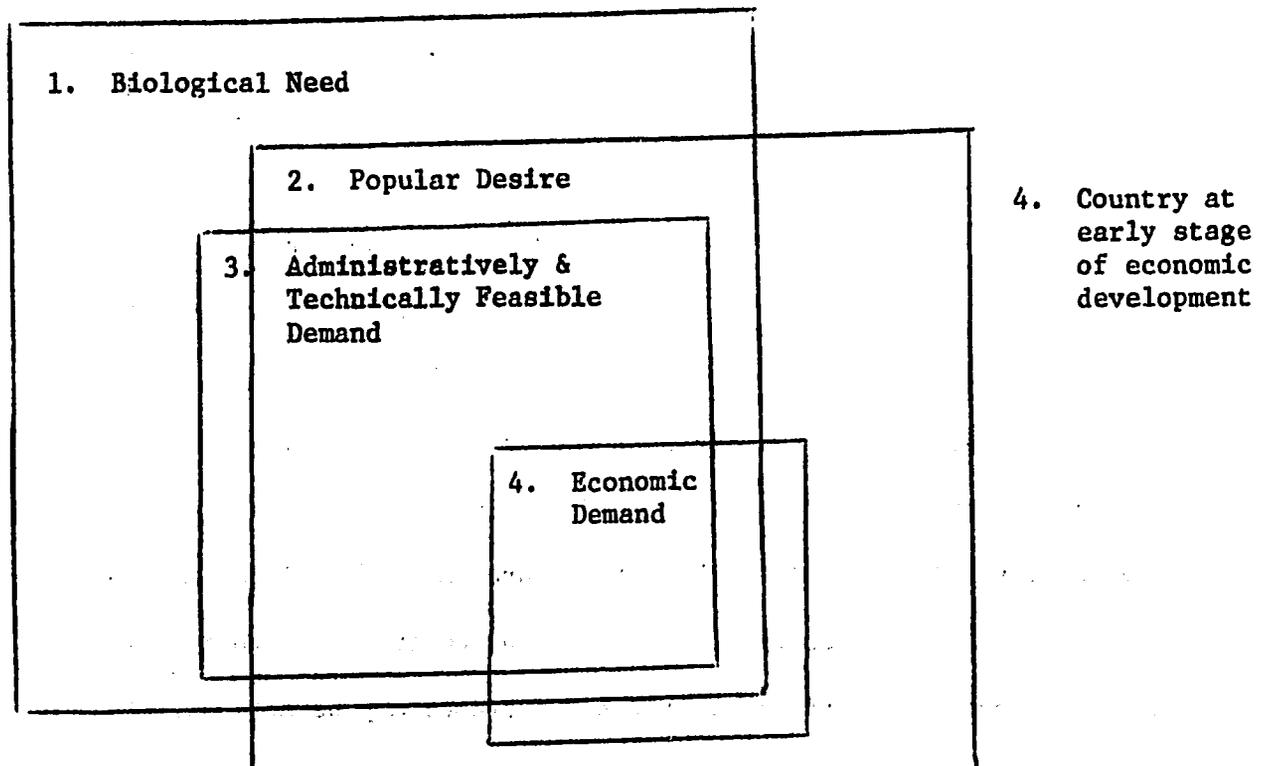
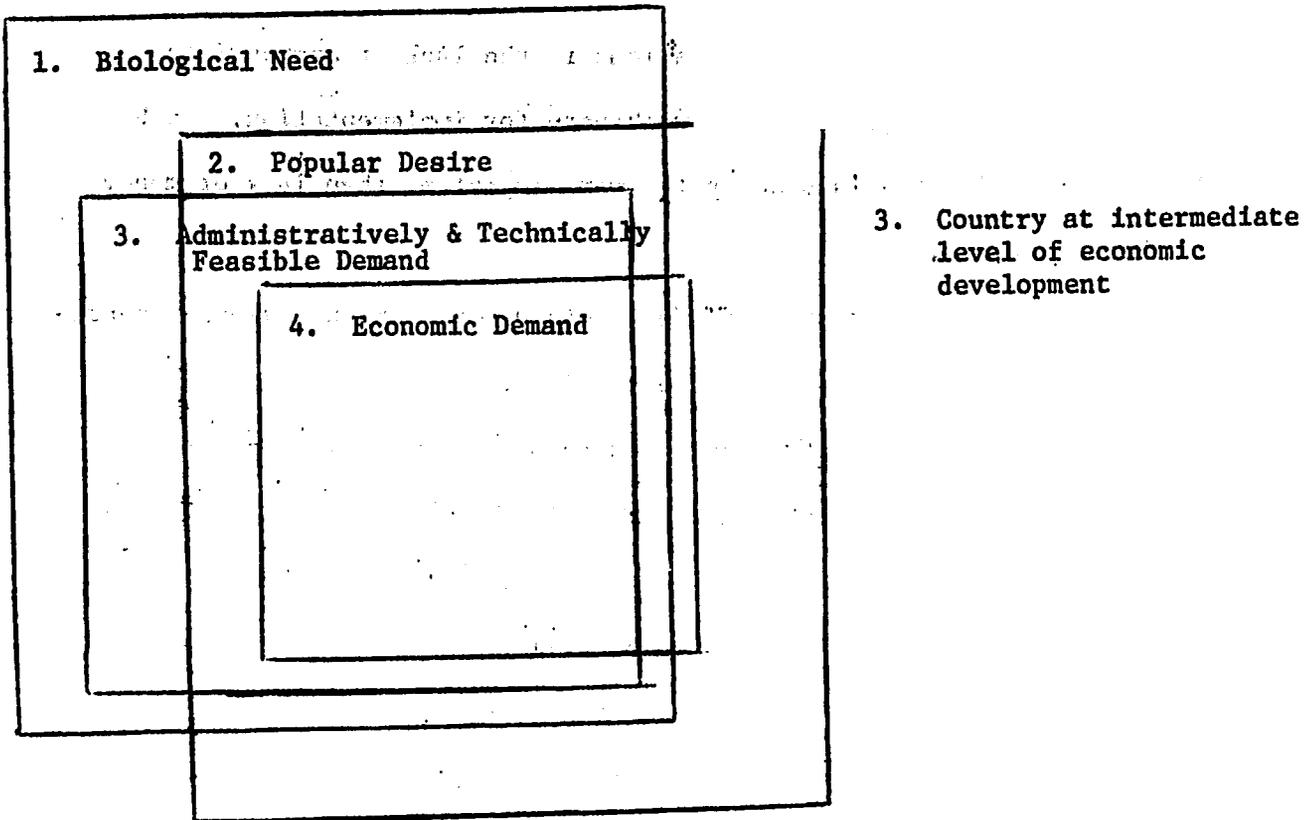
DIAGRAMATIC MODELS OF RELATIONSHIPS BETWEEN BIOLOGICAL NEED, POPULAR DESIRE, ADMINISTRATIVELY & TECHNICALLY FEASIBLE DEMAND, AND ECONOMIC DEMAND



1. Affluent country with large Private Sector.



2. Economically developed country with strongly nationalized health services.



non-application of technical innovations is the lack of appropriate administrative and organizational machinery for implementation. Such administrative inertia is usually far more important than lack of money or other resources.

The fourth area represents "economic demand" which obviously represents the disciplinary approach of economists. There are many health measures which are administratively and technically feasible but for which individuals or society cannot or will not pay. When health measures must be purchased on an individual basis, each person has to choose between alternative options of where he will spend his money. Often individuals decide to suffer discomfort or progressive incapacitation rather than to give up favored expenditure items. This relegation to low priority is particularly common with preventive measures. One of the reasons why society usually has to provide preventive services for the benefit of the group is that individuals do not take a sufficiently long range view to pay for such services spontaneously. Economic demand is usually the smallest area on the diagrams and represents the ultimate determinant of what manpower will be provided.

Obviously, "effective demand" depends on a varying mix of these factors. The first pair of categories represents two ways of looking at the total scope of health service requirements. The last two include the major constraints which limit what can or will be done.

In the comparative models drawn for countries at various stages of development (Figures 1-1 and 1-2) there are important differences in the amount of overlap. In the most developed countries the four areas have a high degree of congruity. But a difference may be noted in that

"economic demand" and "administratively and technically feasible demand" in affluent countries with a large private sector more nearly follow "popular desire", while in economically developed countries with strong nationalized health services they are presumably more influenced by "biological need." The degree of congruity declines according to the level of development with a progressively smaller proportion of initial need being included in economic demand. In most instances "economic demand" is ultimately influenced more by "popular desire" than by "biological need."

Categories of Health Personnel and Definitions

Health personnel, more than most working groups, have a remarkable tendency to aggregate themselves into tight occupational entities. Each such group develops an esprit de corps which has the good quality of pressing for group advancement but also the more restrictive quality of being competitive to the point of producing friction with other groups. The hierarchical striving between groups and individuals is scarcely conducive to the planner's dream of team spirit. It is almost a man-power dictum that any occupational group, once it has become aware of its own intrinsic identity has an independent life of its own manifested in a continuing striving for survival. Occupational groups in the health field have a great propensity for organizing themselves on a somewhat less self-seeking basis than most unions and, in many instances, are the first to establish requirements and standards of performance to be imposed on those who seek to be admitted to the group. There is much talk in such groups about working to advance the public good as well as their own group good. In spite of a common tendency to protect the

status quo, many such groups do become sensitive to social pressures for change. As these pressures build up to the level where change seems inevitable the group will often move into a position of leadership. The unassailable logic is "if changes are going to come, let us make sure that they are in a direction favorable to our profession."

In some developing countries one of the worst sequelae of foreign influence is the heterogeneous and unplanned mixture of categories of health personnel that have been introduced by various groups bringing aid. Not only do different agencies recommend different patterns of manpower organization, but there may also be a sequence of different systems imposed by successive advisors from a single agency. A dramatic example is the auxiliary training program that was developed with foreign assistance over the past fifteen years in one Asiatic country with no medical school. Each new foreign advisor felt that in order to justify his tour of duty he should improve on the auxiliary program previously started. New titles were applied to each new category of graduates and major curriculum changes in the training school were imposed. The employment problems created by the succession of differently certified and trained individuals have been little short of chaotic.

A continuing problem is that international advisors often seem to assume that ancillary categories should be easy to work out. They frequently make dogmatic statements based on experience in an entirely different country and situation.

The main point to be made is that although there are a few general principles about functions needing to be filled and types of personnel to be used, the final decisions about auxiliary categories and

relationships must be based on complete familiarity with the local situation. Whereas professional categories of health personnel are essentially interchangeable in the world market, the ancillary categories must be derived from and adapted to specific local situations. Serious damage follows attempts to arbitrarily impose auxiliary programs which have been successful in one country in a different situation.

It is, however, essential that some effort be made to clarify the present confusing manpower matrix. In Table 1-1, the various manpower categories have been divided into three levels. The arbitrary decision was made to base this primary classification on educational level.

Professional categories have been considered to be those which require technical training in addition to education beyond a bachelors degree. Middle level manpower includes those categories which range around the basic requirement of high school education plus approximately two years of technical training. Low level manpower has been defined as being those categories which have something approaching elementary education plus one year of training. Included in this category are the various types of short term training and ad hoc programs. An effort has been made to relate these three manpower levels to functional categories. Examples are given of specific personnel types which have developed at various times around the world. Such a matrix provides a framework to help classify personnel so as to define their respective roles.

A generalization derived from attempts to classify categories of health personnel according to the above matrix provides insight into possible sources of friction. Problems arise when there is excessive overlapping of functional responsibility or lack of clear distinction between levels.

Table I-1

CLASSIFICATION OF HEALTH AUXILIARIES AND THEIR RELATION TO PROFESSIONALS

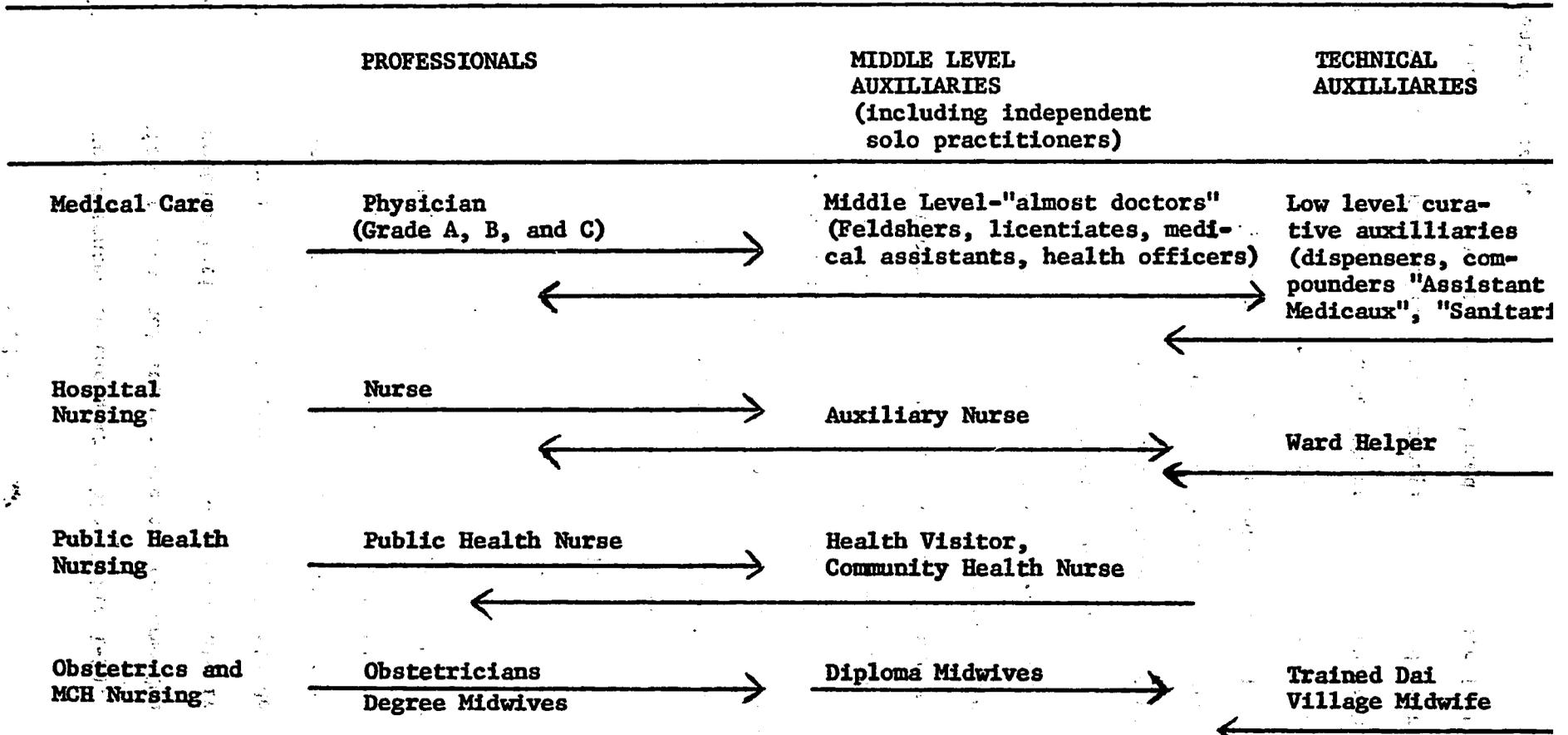
FUNCTION	PROFESSIONAL (Degree Course)	LEVEL OF EDUCATION	
		MIDDLE LEVEL (High school plus 2 or more years training)	LOW LEVEL (Elementary or middle school with up to 1 year training)
Medical Care	Physician	Feldsher (Russia) Licentiate (India & Pakistan) Behdar (Iran) Medical Assistant (Pacific & Africa)	Dresser First Aid Man Medical Corpsman (Armed Services)
a. Independent responsibility for treatment			
b. Comprehensive care	Occasional Physician	Health Officer (Ethiopia)	Village Health Worker
c. Diagnostic and Therapeutic Specialties	Specialist	Technicians - laboratory, X-ray, Physiotherapy, etc.	Technical Assistants
Hospital Nursing	Degree Nurse	Diploma Nurse Auxiliary Nurse	Auxiliary Nurse Ward Helper
General Public Health	Public Health Physician Public Health Nurse	Health Visitor Community Nurse	Community Nurse
MCH and Obstetrics	Physician Midwife	Midwife Auxiliary Nurse Midwife	Auxiliary Nurse Midwife Village Midwife (trained) Trained Dai
Sanitation	Sanitary Engineer	Sanitarian	Sanitary Inspector
Specialized Functions for Mass Diseases	Public Health Specialist	Malaria Officers (upper echelon)	Malaria Sprayers, etc. Vaccinations Leprosy officers Sleeping sickness officer Tuberculosis health visit

Examples are presented in the next table (Table 1-2). When different categories of personnel are working at the same function in the same place, smooth relationships can be developed only if each has a clearly defined level of responsibility based on clearly demarcated training and hierarchical levels. When functions are overlapping and levels of preparation are similar, tensions are inevitable. A classic example in the medical care function are the conflicts which have consistently occurred between fully qualified doctors and the various categories of "near-doctors" or medical assistants. Many such categories have been developed at various times and with varying success. Examples are the "Feldschers" in Russia, the licentiates in India, medical assistants in Africa and Fiji, "Behdars" in Iran, and "Assistant Medicaux" of French speaking Africa. Such programs operated successfully as long as there was no conflict of interest with doctors. Then as competition increased professional jealousy, public confusion and licensing difficulties led to so much trouble that almost universally the decision has been to upgrade the whole assistant category to full qualification as doctors. Feldschers have all along been permitted to go on to full medical education if they proved sufficiently capable.

Similarly, in nursing functions, friction has arisen when there is an overlap between categories. In India the present conflict between public health nurses and health visitors presents a typical dilemma which is far from resolved. Health visitors have almost as much preparation and a somewhat similar role in health centers as public health nurses. Both groups are sufficiently strongly entrenched in the health system so that neither wants to be displaced by the other in the rural health center program.

Table I-2

OVERLAPPING SPECTRA OF PROFESSIONAL AND AUXILLIARY FUNCTIONING RELATIONSHIPS



An important consideration that adds to the confusion is that in many developing countries lower level personnel are, in fact, more adapted to the needs of the masses of people in rural areas than more highly qualified persons. In spite of all of the basic logic supporting the need for lower level ancillary personnel to meet the mass medical care problems of rural areas, a workable manpower balance has not been evolved in any country except where the health system is highly controlled as in Russia. An almost inexorable sequence is that once the higher personnel reach sufficient numbers to begin to saturate urban demand, the psychological impact on the middle level rural personnel will lead to disruption of their services. Such rural categories should therefore be considered only a temporary expedient. The most rational approach seems to be to plan from the beginning for health categories which are so clearly separated that there cannot be a confusion of roles. A clear arrangement should be provided for upward mobility to the point of phasing up by retraining the overlapping category when their role can be adequately filled by more highly qualified persons.

Natural History of Health Manpower Development

Comparative analyses of the manpower development sequences in several countries has led to recognition of what is essentially a natural history of the process. Four levels of development have been defined.

Indigenous Medicine. No nation or people is completely without resources for medical care. Diverse categories of personnel have developed traditionally, spontaneously and with fascinating historical derivations in every country. International health workers who go into so-called primitive countries thinking they will be developing a health

service in a vacuum are grievously in error. Their success will be limited until they take the trouble to understand local practices and beliefs. Although the health system may be mainly witchcraft, every society has accumulated a body of empiric understanding and experience which has usually been systematized into a rational structure. The individuals who serve as the prime repositories of traditional health lore should be identified early. A common experience is that, in order to understand what people believe, one should go first to the local indigenous practitioners. By getting their interpretation of health phenomena and control measures, the international health worker will obtain a broad picture of what the general public believes. Popular ideas will be dilutions of the beliefs of indigenous practitioners.

Most indigenous systems of medicine include a wide range of specialization. Certain empirically discovered procedures are sufficiently effective against specific conditions to merit wide acceptance. More often, because of a chance sequence of apparent magical cures, certain individuals develop an impressive local reputation which may have nothing to do with empiric effectiveness. Such a reputation is often focussed on one particular type of health problem, especially when it is a condition of uncertain etiology for which no one has a definitive treatment. Reputation then often becomes more important in determining public acceptance than demonstrable success.

A synergistic relationship may develop between various categories of health practitioners, with mutual support and referral of cases depending on their specialization. For example, we have found such a relationship between spiritual healers such as Hojas in Turkey or the

Lamas in Bhutan and the local needlemen or herbalists. In Turkey, as in many countries, the healers may be roughly categorized into two groups. There is a large group that resorts to various physical and pharmacological treatments that require the use of medications or physical manipulation. These range from the much respected bone setters to the quacks, who use everything from injections of penicillin to a treatment for hemorrhoids which requires the patient to sit with his hemorrhoid in a hole cut through the shell of a live turtle. Then there is a second group of practitioners whose appeal is frankly magical and through suggestion. These include spiritual healers who make use of the tombs of saints and verses from sacred scripture, but there are also specialists in elaborate manipulations whose Turkish name can best be translated as "umbilicus setter" and "coccyx puller." The umbilicus setter treats abdominal pain with massage of the abdomen, culminating in a dramatic flourish to reset the umbilicus in its proper position. The coccyx puller goes through similar massage and resetting maneuvers in order to treat backache.

Some indigenous systems of medicine are highly formalized and culturally rigid. Ayurvedic medicine, for instance, is still taught from a set of classic text books published 1500 to 2500 years ago. The ancient Chinese system of medicine includes elaborate anatomical studies which form the basis for such refined arts as acupuncture, in which long needles are inserted into appropriate points in the body to relieve pain and local disease. Western trained doctors in Arabia accept as empirically effective the ancient practice of cauterizing the heel with a hot knife to treat diarrhea and abdominal cramps.

The many instances in which empirical treatments have been demonstrated to have scientific validity should lead one to be cautious in automatically ridiculing all practices that do not fit current western medical thought. Particularly through the discovery of herbal pharmacologic agents such as the rauwolfia drugs, ephedrine, quinine and digitalis, ancient empiric lore has contributed much to modern medicine.

When a western trained health person first comes into contact with indigenous practitioners, a fascinating process of social change is initiated. Frequently the first western trained health personnel to reach the rural areas still dominated by indigenous practitioners are low level and poorly qualified individuals. Not only are they technically inadequate representatives of western medicine but they oftentimes carry the additional stigma of being outsiders from the city and the villagers are suspicious of them.

They must also anticipate the normal response of local indigenous practitioners who will deliberately try to neutralize or negate their influence.

Trained health personnel face a difficult choice in working out their relationship with indigenous workers. The dilemma is whether to try to incorporate the indigenous worker into a cooperative working relationship or to as rapidly as possible reduce his authority and influence in order to supplant him. Dogmatic opinions are expressed in support of each position. There is much logic on the side of those who say that until organized health services are prepared to provide complete care for rural areas, it is better not to interfere with existing indigenous practices. The Curanderos who serve the 40 percent

of the Peruvian population who live in the high Andes cannot be immediately replaced. Many countries have deliberately attempted to prohibit legally all non-scientific medicine as being dangerous. In Turkey, under Ataturk some thirty years ago, such legal prohibitions proved a total failure. In spite of strict laws which still stand, the people have continued to use indigenous practitioners because they had no assurance that something better was available. It is logical, therefore, to work out a modus vivendi. On the other hand, a program of health education will undoubtedly conflict with many of the injunctions of indigenous practitioners. Decisions must be made selectively about the few specific issues which are so important that local beliefs must be demonstrated to be wrong. More often, local beliefs can be reinterpreted to support the new desired practices. It is usually much easier to change practices than beliefs.

The fact is that with few exceptions efforts to work with indigenous practitioners and incorporate them into organized medicine have usually not worked. Many attempts have been made to develop such cooperative working relationships. In India a major effort to synthesize Ayurvedic and scientific medicine followed independence. Large numbers of special schools for training such synthetic practitioners were started. In the first place, synthesis of the basic sciences of the two systems proved a complete failure and eventually the western system of anatomy, physiology and other basic sciences was taught. It then proved impossible to present the clinical teachings of Ayurvedic medicine in an understandable way since diagnosis and treatment are traditionally based on understanding the balance of humors. No

cross-communication of concepts proved possible. Graduates of the special schools were given special degrees illustrated by one school in Benares whose Doctor of Indigenous Medicine came out with the initials D.I.M. In the early 1960's most of these schools encountered serious problems as a result of widespread student strikes. Students insisted that they be given the same degrees and privileges as graduates of regular medical colleges because they were essentially duplicating the regular course. Finally, the whole effort to synthesize the two systems was given up. Many of the combined schools were converted completely to regular medical colleges. A few reverted to what was called "Shudh Ayurveda" in its pure form and gave up any pretense of incorporating scientific medicine.

Many efforts have been made on the local level to incorporate indigenous practitioners into rural health center services. In a few instances this has worked with the major determinant being whether the indigenous practitioner was willing to give up his traditional practices and be retrained in the new system. On the other hand, even if no effort is made to actually incorporate them into the local health service, personal experience in India indicates that warm and friendly relationships can be maintained with ayurvedic practitioners as long as they are accepted as colleagues with their own set of contributions to make in their own way. Most indigenous practitioners very quickly recognize the superiority of chemotherapeutic drugs and incorporate them into their practice. We have seen indigenous practitioners grinding leaves for herbal preparations who regularly tossed in an appropriate number of tablets of sulfa drugs to increase the potency of the fever

mixture. Similarly, many indigenous practitioners now expertly wield a poorly sterilized syringe and needle and routinely give injections of penicillin or streptomycin.

The one indigenous practitioner who has, around the world, been most readily and effectively retrained for working in cooperation with regular health services is the indigenous rural midwife. In all countries certain women either formally or informally acquired practical experience in midwifery and became established as the local birth attendants. There have been many demonstrations in China, India, Indonesia, Latin America and the Middle East that in a relatively short period of training these indigenous midwives can be taught enough of the basic fundamentals of good delivery practice to produce dramatic improvements in maternity care. Such basic training must be tied to appropriate incentives and supervisory relationships to ensure a continuing effect. The UNICEF contribution in such programs has been particularly noteworthy since they have provided attractive midwifery kits which serve both to improve the delivery methods and as an incentive and badge of improved status for the indigenous midwife.

In summary, our general experience has convinced us that the most logical and workable relationship with most indigenous practitioners is one of mutual toleration. It has proved impossible to take them into western medicine because their basic understanding of disease causation and methods of control are so different that it is easier to start from the beginning in training auxiliaries. However, if they are treated with courtesy and friendship there can be a transition period during which people learn for themselves which forms of care are most effective.

Such a gradual transition will probably produce minimal trauma for both groups of health personnel and the public.

Sophisticated Medical Care for Elite. Uniformly in a developing country, the first introduction of scientific medicine is to provide high quality care for the small numbers of political and economic elite. In colonial days it was a precondition of life in tropical countries for colonials to bring along the most sophisticated medical care available. The health hazards in the new and exotic environment made survival impossible without the best preventive and curative services that could be mobilized. The residential areas for colonial rulers were islands in a sea of health need which provided maximum health protection and sanitation facilities, a fact which was naturally used to partially justify the pattern of luxurious living. Curative activities were centered in hospital facilities equivalent to those in the home country.

As ex-colonial countries have become politically independent, and also as non-colonial countries have started to progress, one of the first manifestations of development is the provision of high quality medical care for the nation's elite. To some extent such care is combined with pleasure trips to the major medical centers of Europe and America. On the other hand, there is a strong drive to build beautiful hospitals, preferably as part of a western style medical school. Clinical specialists are greatly in demand. Such advanced technical facilities for medical care not only serve as status symbols to satisfy national pride but probably more importantly they provide the national leadership with a feeling of security that when they get sick they will be cared for adequately.

Concentrated attention on the health care of the elite is not necessarily bad. The idea that a country's greatest resource is its leadership and that the skilled and technically competent elite represent an investment that must be protected has much rational justification. The death of one such individual from preventable disease can have deleterious effects on the future of the whole country.

The elite are also the first to seek technical and professional education. The commonly observed phenomenon of health manpower being developed with the primary emphasis on educating those at the top results in part from the fact that medicine is recognized as an appropriate career goal for the youth of elite families. When they can, they go overseas for their professional education. Otherwise there is pressure to develop a medical school locally to provide professional education. Such personalized incentives for the families of the upper socio-economic groups usually far outweigh the more rational approach of balancing the educational effort with larger numbers of lower level health personnel.

Even mission medical institutions which originally were started to serve the poor often find themselves in the somewhat ambiguous position of providing quality medical care for the elite. They can often meet the need for better facilities more readily than most government services. A western doctor can also command for his hospital, fees which make it self-supporting, but this usually produces a feeling of ambivalence among medical mission personnel about the amount of their time going into non-charity work. The justification is, of course, that by collecting fees from those who can pay, it becomes possible to provide care for the poor, but the balance is hard to maintain.

Mass Disease Control Programs. The next stage in the natural history of health service development is usually official attention to the mass disease problems. In developing countries the mass diseases are usually infectious diseases and malnutrition. Setting up such programs to protect the poor does not necessarily arise from altruistic motivations. Most infectious diseases carry a considerable hazard of spreading to the country's elite. In colonial days undoubtedly a part of the motivation to control epidemic diseases was because their presence represented a continuing personal danger to colonial authorities. As a result, preventive barriers were first set up around the residential areas of officials. Gradually the concept spread that to make the country really safe, it would be necessary to concentrate on mass epidemic control procedures.

In addition, there was the logical justification that mass preventive measures produced the best-cost benefit returns in improvement of the people's health. Finally, there was in many instances a real humanitarian motivation that must have had a strong influence. No one can live through a major epidemic of a disease such as cholera or smallpox and see the dramatic and overwhelming toll on human life without being stirred to attempt control measures.

Whatever the motivation, most developing countries now have a systematic program for epidemic control. International agencies have provided both a strong stimulus and financial and technical support. Part of the subconscious motivation behind international programs includes recognition of the implicit hazards of international spread. There is also growing appreciation of the fact that the worldwide

population explosion is in part a result of such programs which initiate the whole necessary cycle of demographic change.

In spite of the logic behind mass prevention, what the general public really wants is a minimal level of medical care. Their natural reaction is to say in all simplicity, "take care of the sores, fevers and pains we now have and then we will talk about preventing future illness." As they learn that it is possible to get better care than that provided by indigenous healers, they will exert political pressure for a simple pattern of care which has maximum built-in acceptance if it is not too sophisticated. If such care is not provided by government, quacks will move in with local adaptations of many pseudo-scientific systems such as homeopathy. Correspondence courses in homeopathy have provided mass training for years in countries such as India and have recently developed as a major private practice phenomenon in Russia.

The general sequence can be summarized by tracing the particularly instructive experience in Turkey. After the practice of medicine by indigenous hakims had been prohibited legally, this system of medicine went underground. The only practitioners who were permitted to continue relatively undisturbed were the various categories of spiritual healers who functioned without clearly identifiable clinical therapy. During the last twenty years the vacuum has been filled by a large number of rural practitioners whose local name can best be translated as "needle-men." Most of these individuals are young men who served in the army as medical corpsmen. They had been drafted from the villages. They were taught to read and write in the army and given the usual basic medical course. On returning to their villages they promptly set themselves up as independent

practitioners. Their badge of office and main tool of trade is the syringe and needle and a Primus stove. Their use of chemotherapeutic agents such as penicillin is indiscriminate and massive. They, of course, achieve some dramatic results. They are conveniently available in almost every village and expect no large fees since usually their medical practice provides only part of their total income. The 40,000 needlemen now practicing in Turkey are in contrast to the 10,000 doctors and the 8,000 middle level health personnel. The important consideration is that these needlemen by contrast to the ordinary indigenous worker, do have a basic grounding in scientific medical practice. It should be possible to work out a systematic arrangement for selecting the individuals with most promise and making appropriate use of their talents which could be upgraded by further basic training. Even more important is the fact that there is a continuing flow of medical corpsmen through the compulsory military system of Turkey. It seems apparent that an ideal arrangement would be to work out a cooperative training program between the military and the ministry of health so that a tremendous health manpower resource for low level medical care auxiliaries could be developed. These individuals could then be included in the developing of National Health Services in multiple village sub-units of the rural health centers to reach the population in a way that is not now possible.

Two major approaches in mass medical care have been linked historically to the French and British colonial systems. Particularly in the French colonies in Africa there developed a categorical disease approach. Historically, it started with sleeping sickness campaigns which were attached in a nationwide coverage by mobile teams in a highly

efficient organization. Gradually the coverage of the categorical disease programs was increased so that the mobile teams diagnosed and treated as many as six or eight mass diseases. The hierarchical relationships were tightly organized in military fashion. They were highly centralized working out from a capital city of the colony with a few regional officers responsible for large areas. For instance, the whole of Chad is covered by six French medical officers as regional directors. They trained their own ancillary personnel. The chiefs were required to have all their people lined up for examination and treatment on specified days as the team made its routine tours. They have been effective mainly against those conditions for which a simple, direct and effective control measure could be applied by ancillary personnel such as yaws, leprosy and trypanosomiasis. Since independence of the African countries, the French relationship and support has been maintained through various country programs of "Grandes Endemies."

Under the British system the tendency has been to attack all mass diseases through a combined health service which provides residential personnel working in a health center. The exception, of course, has been that some special countrywide programs such as malaria eradication or smallpox and measles vaccinations have been stimulated by international cooperation. A promising suggestion is to use a national program such as malaria eradication to start a comprehensive health center service. At their best, these locally based health center programs are part of regionalized systems for comprehensive care and will be discussed in the next section. In the past, however, they have more often merely provided low level dispensary care with extremely poor standards and little supervision.

Comprehensive Care. In the developing countries where scarcity of funds and personnel demand maximum efficiency, there has been general acceptance of the concept that health services should be based on the idea of comprehensive care. The fundamental principle is that efficiency will be increased by preventing overlap. Countries with an extreme shortage of doctors will be fortunate if they can get one physician to serve in a population unit whose size may range from 10,000 in Turkey to 80,000 in an average community development block in India. The manpower shortage is an even more important constraint than limited finances in forcing the necessity of using each individual for those priority functions which only he can perform. Planned integration of health services based on a fresh approach to functional analysis leads to a set of priorities which are quite different from the present categorical separations of functions based on existing stereotypes of what health personnel should do.

The major defect of health services as they have spontaneously evolved in western countries has been the artificial separation of curative from preventive work. Curative functions have assumed undue importance primarily determined by popular demand. The lack of scientific sophistication in the general public does not encourage recognition of the greater good of long range investment in preventive measures. Instead, they express the usual concern for immediate relief and willingness to pay almost anything for a dramatic cure. The distortion of priorities is clearly indicated by the precedence in prestige accorded to surgeons as practitioners of the curative procedures with the most dramatically beneficial results. As the general public becomes more

sophisticated about the relative time scale of health measures which produce maximum benefit, they show increasing willingness to pay for a long range investment in preventive procedures.

Where the overall priorities of health services can be planned from the beginning, rather than developing spontaneously as in the United States, there is recognition that it is necessary to bring preventive and curative functions into the same priority setting process. This leads to the first element of good comprehensive care which is to add to a core of general medical care those specialty or ancillary services, whether curative or preventive, which will most efficiently meet high priority needs.

The second dimension of comprehensive care is the spectrum of the various times and locations at which services can be made available. Comprehensive care should include a unified sequence of activities which range from routine contact with the public in their homes through the various forms of ambulatory care to the most advanced specialty provision of inpatient care. At each stage appropriate technical and laboratory facilities should be available. A unified record system with continuing cross-communication is essential.

It is sometimes thought that comprehensive care requires centralized control in a socialized system of medicine. This is not necessarily true as has been demonstrated in various cooperative regionalization programs in the United States.^a It takes much more work to organize and maintain cooperative relationships between separately financed or

^aMcNerney, W. J. Regionalization and Rural Health Care. U. of Michigan, Research Series #2, Ann Arbor, 1962, p. 209.

privately supported groups of practitioners than when financing is centralized, but it is possible. One of the greatest limitations continues to be that privately financed insurance still finds it difficult to justify inclusion of the whole range of comprehensive activities. This is partly because the public continues to be far less ready to pay insurance premiums for long range preventive activities which have traditionally been financed from tax supported funds. The inclusion of medical care services for the medically indigent usually also complicates relationships with private care sources.

On the other hand, the mere process of establishing a socialized and centrally controlled system of care does not automatically mean that comprehensive care will be provided. The real requirement, whether in a centralized and socialized system or in a private or decentralized system, is that careful planning and setting of priorities is required with mechanisms for making facilities and services available at appropriate times.

Once the concept of comprehensive care is accepted then an almost unlimited range of development is possible. Comprehensive care can be provided in isolated rural health centers as part of a total regionalized plan. It can also be developed to coordinate what has been called "metropolitan medicine"^a which otherwise tends to be splintered and inefficient. In western countries public opinion has been strongly influenced by the orientation that affluence permits the luxury of highly sophisticated but splintered metropolitan medicine. It has become

^aMcDermott, W. "The Role of Biomedical Research in International Development", J. Med. Educ., 39: 655-669. (July), 1964.

evident that there is no natural limit in sight for investment of money and manpower in advanced technical facilities and the most specialized and focussed clinical competence. Even the most affluent societies are becoming increasingly aware of the fact that splintered metropolitan medicine leaves major gaps in coverage of the public. As a result of a new emphasis on systematic manpower and health services planning, in almost all countries, alternative measures are being considered to increase efficiency and comprehensive coverage of all segments of society.

Domination of the Health System by Doctors. Although the parallel nature of the various health professions is becoming somewhat more evident, the fact is that doctors still dominate the health industry. There is no decision of importance taken anywhere in the health system that does not ultimately rely on doctors' initiation or acceptance. The medical profession in fact prides itself on its tight control of the health system because of a sense of compulsion to ensure the maintenance of high quality and ethical standards of performance. Being doctors, the authors of this volume do not think that this is necessarily a bad arrangement. In general, medical professional ethic has, throughout history, ensured a sincere and progressive application of rapid scientific advance for the good of the public. Probably no bureaucratic governmental system of health control could function as efficiently as the inner disciplines that have developed within the profession. The doctors' domination must, however, be recognized by policy makers and economic planners. It has become more obvious also that corrective mechanisms to make the usually conservative medical profession more readily susceptible to the need for social change can be considerably improved. The whole process of planning is one such social corrective mechanism.

PART II

METHODS OF MANPOWER PLANNING

INTRODUCTION

The introduction emphasized the importance of health manpower planning and outlined the principal issues, concepts and problems. This part of the book focuses on practical methods of manpower planning. Although our approach attempts to be practical, this is in no sense a "how to do it" manual. The details of health manpower planning vary so greatly from country to country that principles are of more value than precise procedural steps. Since the details of health manpower planning are extremely complex and variable, it is necessary to have a framework for analysis to fully understand the principles. Our analytic framework will certainly not remove all complexities from the planning process. However, it has proved useful in practical tests over the past three years in countries as varied as Nigeria, Peru, Taiwan and Turkey.

Framework for Analysis

I. Supply Analysis: measuring the current supply of all types of health workers in some detail.

II. Projection of Supply: projecting the supply of health workers forward to target dates 10 and 20 years in the future with anticipated additions of new graduates and estimated subtractions due to death, migration, retirement and change of profession, preferably done according to at least two alternative assumptions.

III. Demand Analysis: evaluating the effective economic demand for health services in both the private and public sectors.

IV. Projection of Demand: projecting the effective economic demand forward to the 10- and 20-year target dates.

V. Will Supply Match Demand? - Recommendations to Effect a Balance: comparing the projected supply with the projected demand and recommending necessary adjustments to effect a balance. This sounds quite simple, and as a concept it is. Some of the complexities are described in the body of this monograph.

Chapter II

MANPOWER SUPPLY

Supply Analysis

Needed Information

The first step in supply analysis is to decide whom to count. Of course, doctors, nurses, trained midwives, dentists, technicians, and pharmacists should be included. Untrained midwives, herbalists, and other indigenous practitioners should be counted in countries where they are numerically important and contribute significantly to health care. Groups such as health educators may be touched on briefly for the sake of completeness. Sanitation workers with special training should be included partly because in some countries they are not routinely considered part of the health system. It is not generally considered necessary to count untrained persons who happen to be working for medical institutions. Most ambulance drivers, hospital maids, and hospital clerks should not be counted as they are a part of larger general manpower pools.

We have been surprised at the difficulty of establishing an appropriate perspective, especially in getting health authorities to concentrate on essentials in studying the supply of health manpower. It is very easy to be diverted by suggestions that detailed study of relatively small groups such as occupational therapists is necessary for adequate health manpower planning. Our experience has shown that concentration on the most numerous and important segments of the health industry is more valuable than a diffuse and wide-ranging study that attempts to study all categories of health workers.

Definition of categories of health workers is the next step in analysis of supply. Just what will be included under the term "doctor" -- should osteopaths, licentiates, grade-B graduates, naturopaths, chiropractors, herbalists, curanderos, all be included? Although definitions will vary from country to country, a useful guiding principle is to have one group of doctors comprising all persons licensed to practice modern, scientific medicine. This is not to say that herbalists and curanderos should not be counted. Such groups may be important, but should be studied separately from doctors.

In measuring supply it is confusing to overclassify the health professions into many subgroups. For each class of health worker two groups -- professional and assistant level -- should be adequate for most general health manpower planning. Usually a definition based on years of training is most useful in determining these groupings. In many countries there is an almost continuous spectrum of nursing personnel. For practical purposes of analysis the several categories may be combined.

In addition to knowing the total numbers in each category of health professionals it is also important to know their distribution by age, sex, income, type of practice, geographic location, educational background, and specialization.

Knowledge of age composition is essential for making future predictions of change of supply. For example, in Taiwan we found that there were almost five times as many doctors age 35-44 as age 25-34. Authorities were unaware of this dangerous gap in physician manpower that would not manifest itself until 1985, when it would be too late to institute corrective measures.

It is important to learn the sex distribution of health professionals in countries where women have a very different working pattern from men. The differences in duration and pattern of useful professional life of females as compared with males may be considered in setting patterns for admission to professional schools. This is balanced by the special professional roles that women play in some societies. Sex distribution is also important in determining costs of a given category of professional where salary differentials based on sex exist.

Information on educational background is needed to cross check figures from training institutions. It is also important to learn how many workers are native-born and native-trained in order to assess the importance of immigration of health professionals. Educational background is also useful in defining categories of health workers and in comparing the contributions of different training institutions to the various sectors of the health industry.

The importance of studying specialty practice will vary widely from country to country. In many developing nations "specialization" is still rudimentary and largely self-defined. Under such circumstances, classification of physicians or other professionals by "specialty" will not tell the manpower planner much about the reserve of technical skills available in the country, though it may help characterize current professional practice. For most countries only three questions need to be answered: (1) is the percentage of practitioners who restrict their practice to one or another specialty "too high"; (2) is the almost universal trend towards specialization proceeding "too fast"; and (3) is there a shortage among certain key specialties. Since there are no precise answers to these

questions it will usually suffice to obtain approximate data on specialization and not enter into the details of each of the separate disciplines.

Knowledge of geographic distribution is essential. A country may have adequate overall numbers of physicians so poorly distributed that corrective action is indicated.

Income estimates are essential in order to permit calculation of the approximate costs of alternative manpower policies. The reluctance of professionals, especially those in private practice, to disclose their incomes hinders obtaining such data. In many cases disclosing real income would bring major penalties in terms of increased taxes. In Taiwan we had to estimate physician income by indirect means. We found the average per capita monthly expenditure for physician services (from 66,000 persons in our random sample), multiplied this average by the total island population, and divided the product by the number of physicians in practice in Taiwan. Thus we calculated the average gross physician income. For government employees, calculation of income was unexpectedly difficult. Special allowances for housing, food and even oil, multiple government jobs, and, most of all, part-time private practice (often clandestine) all complicated the calculation of income.

Indirect procedures were also used in Peru. Seven different models of medical practice were constructed according to location, specialty and type of job, and the following data obtained: private patients seen per hour, hours worked per week in private and government practice (from the manpower census), weeks worked per year, average fee per private patient, and income per hour in government employ. By suitable combination of

these data average gross physician income was derived. The estimates for the seven categories ranged from a low of less than \$400 per month to just over \$800, with a national average of \$560.

In Turkey private practice income estimates were derived in two different ways and compared. In the basic census questionnaire a forth-right question was asked. The surprisingly direct responses seemed to have been generated by the widespread feeling that doctors are underpaid. Nonresponses obviously were mostly from those making the most money. General practitioners said they made only \$77 per month while specialists reported \$155 per month. An indirect estimate was obtained by combining the results of two other surveys. From a 10% sample detailed questionnaire (97% response rate) data were obtained on average fees charged by doctors under various circumstances. A separate questionnaire was sent to doctors in private practice to obtain data on characteristics of patients seen. This provided detailed information on patient load. Simple multiplication then gave an average monthly income for general practitioners of \$309 per month and for specialists of \$392 per month. These figures are 4 times and 2.5 times, respectively, the amounts they reported on direct questioning.

Public sector income in Turkey was obtained readily from standard salary scales. Calculations were complicated again by the fact that half of all doctors and 64% of Ministry of Health doctors hold more than one job.

Another significant attribute of the health worker is his type of practice. That is, the number of hours he works in private practice, in teaching, for the state, for a commercial concern, for a voluntary agency,

It is essential to have some knowledge of productivity: the number of patients seen by the average practitioner per unit of time. Of greater value would be the number "helped" rather than just seen, but such information is virtually unobtainable. It is also useful to have information on variation in productivity from region to region and from sector to sector, as was obtained in our Peru study. Where productivity falls below acceptable norms, the supply of services can be effectively increased without adding primary resources (e.g., beds and doctors), but merely by increasing their productivity.

Average productivity may be determined by review of records in Government hospitals or health stations, or by a consumer survey of the use of private practitioner services. However, the range of productivity of practitioners may only be determined accurately by detailed study of individuals. In the case of private doctors this is a most difficult process. The implications of productivity measures are discussed more fully in Part III.

In order to facilitate both supply and demand analysis it is desirable to borrow the concept of "full-time equivalent" (F.T.E.) status from academic medicine. This concept is particularly useful when applied to those professions (medicine, dentistry) or activities (education) where there is apt to be multiple, and therefore, part-time employment.

The F.T.E. concept can be defined in several ways. Three examples follow:

(1) An arbitrary time span is selected to equal F.T.E. status.

In the Peru study a 39-hour work week was assumed for F.T.E.

professionals in order to compare staffing standards among different academic and governmental institutions. Use of this definition may result in a country having more (or less) F.T.E. personnel than the number actually in practice.

- (2) F.T.E. status equals the average number of hours actually worked per unit of time by professionals in a given category. Using this definition a F.T.E. Peruvian doctor worked 42 hours per week and a dentist, 32 hours per week in 1964.
- (3) F.T.E. is based on the concept of "percentage of effort" rather than actual hours. Thus, one F.T.E. equals the total effort of one person. This definition, used in Taiwan, avoids the potential discrepancy between the number of persons and of F.T.E.s, but may bias comparisons in the staffing patterns between different institutions and the public and private sectors.

Sources of Manpower Data

There are no countries so backward as to have no source of information on the supply of health workers. Nor is there any country so advanced as to have enough information to fully satisfy health manpower planners. In this section we mention many potential sources of information and give details on two, censuses and training institutions.

Obviously most professional health workers come from the country's training institutions. A count of the past graduates, corrected for migration, deaths, and retirement from the profession, will give the potential number of professionals available. However, this source is only

as reliable as the estimates of deaths, retirement, and migration, and these figures are hard to get. Also, health workers in auxiliary categories often have not been formally trained in educational institutions, but have merely taken an examination or, in some cases, simply applied for and received a license.

This leads us to the second source of data on current supply, namely the licensing institutions. This institution, if its basic registration is complete, can serve as a good source of the maximum numbers of legal practitioners in a given country. However, registration data are often out of date as most licensing agencies lack adequate methods for removing those who leave the licensing area, die, or stop practicing.

A third source of data is the professional registries that are maintained in many countries. The registries which are maintained by annual, bi-annual, or tri-annual registration systems give a fairly up-to-date estimate of the total number of active practitioners. However, in some countries this system may miss the practitioners who are working in government institutions, for government institutions may not require registration. It is possible to combine government payrolls with the registry of private physicians to arrive at an estimate of total manpower, but name checks are required to prevent double counting of professionals with more than one job.

Countries that do not have a general registration often have a special registration for permission to use narcotics. Since essentially every physician in private practice will require narcotics at one time or another in his practice, this is a reasonably good source of information,

if the regulations are enforced. The same problem may exist with lists of health workers paying the professional taxes required in some countries. In all of these systems a relaxed governmental policy towards licensure and registration enforcement may lead to highly inaccurate data from official sources.

Professional societies will occasionally have an accurate roster of roster of members of the profession which in some cases include those who are not even members of the society. However, such complete records are more usually found in developed countries.

Personnel or payroll lists of service and educational institutions in the health sector also represent an important source of information. Other sources will be necessary, however, to identify those practitioners who lack an institutional appointment or who use an institution but do not appear on the official roster of employees.

General census data may prove useful if the census machinery in the country under study is worthy of confidence. The major drawbacks of a general census are that it is usually out of date, and that census enumerators accept the statements of informants without verification. Thus, unqualified practitioners may be listed as fully trained professionals.

Pharmaceutical companies may be willing to provide their lists of private practitioners, particularly if they are promised copies of the revised lists resulting from the manpower study. In Turkey such a cooperative arrangement worked extremely well with a mutually profitable exchange of addresses and information with the country's largest distributor of drugs. In other instances, companies which were presumed to have the best lists proved reluctant to release them while those that were made available were incomplete.

Additional sources of information that may be of value are the telephone directory, newspaper advertisements for medical care, and public announcements about changes in the location of practice. In Turkey the best information about doctors dying or leaving practice was obtained by going over old copies of a news sheet published by a drug company. A number of doctor addresses were traced by reading notices published in newspapers by grateful patients -- a common practice in Turkey. In Peru the attractive possibility of a phone census was tried with those practitioners not otherwise readily available. Although some forms were filled out in this manner, the percentage willing to provide complete data was low.

Health Manpower Census

The last, and undoubtedly the most accurate, method of determining the current supply of health workers in the country is to conduct a special census. Unfortunately, this method is both time-consuming and expensive. However, if a country has no good source of information on the numbers and distribution of health professionals, a census can be the starting point for an effective registration system for such personnel. Such a system is a necessity for logical health planning in any country of the world today.

The easiest census consists of a mere enumeration, primarily from personnel and other official files, of professionally active health workers classified according to type, sex and location. If this information will suffice, the task of collecting it is not difficult since there is little need to directly contact the individuals to be enumerated. By

using the various sources of information already discussed, a master list can be compiled which will provide a reasonably accurate estimate of the manpower supply.

For most countries starting to do manpower planning, enumeration alone is not enough; additional qualitative information is required that can only be obtained from each individual. Unless this type of census is carefully planned and administered, more time may be spent than the results are worth.

The first step in planning a census is to clearly specify the information required, limiting it to the absolute minimum possible. The importance of limitation cannot be over-emphasized since census difficulties increase proportionately to the number of questions asked.

The experience of the Peru study was convincing in this respect. The first questionnaire, designed by a multi-disciplinary team with diverse objectives in mind, took about 15 minutes to complete, and almost none of the information could be supplied from official files or other sources. As a result, busy professionals usually asked that the census enumerator leave the questionnaire and return for it at a later time. Frequently, however, one repeat visit did not suffice; the original form was lost, or was not completed, or the person to be interviewed could not be found at the time of the return visit. The census forms were subsequently revised and shortened,^a enabling it to be completed in less than two minutes and

^aExamples of questions later omitted include: location and years of attendance for primary, secondary, and higher education; location, employer, job classification, and years of attendance for each job ever held; and present job functions.

thus avoiding the necessity of most call-backs. By eliminating virtually all questions answerable only by each respondent, it even proved feasible to complete most of the census form from secondary sources in situations where the individual to be enumerated was not readily available.

Based on our experience, a census should obtain at least the following:

- (1) Individual characteristics. Birth year, sex, profession, year of graduation or licensure, and location of training.
- (2) Activity characteristics. Activity status (active, inactive), location(s) of employment, job(s) held, employer(s), and hours per week (or percentage of effort) devoted to each job.

Depending upon the local situation, additional questions may be indicated such as specialization, postgraduate training, marital and citizenship status, income, number of patients attended, intentions regarding future studies and emigration, and special information about those in retirement. The importance of obtaining information of this type on all health professionals, however, should be carefully weighed against the cost.

In both the Taiwan and Peru censuses information was obtained directly from each health worker by a census enumerator. A mail census was not used on the assumption that the response rate would not justify the expense of preparing an address list, nor would it avoid the necessity of using more direct procedures. Our experience in Turkey with a simple questionnaire mailed to over 11,000 doctors lends support to this conclusion. The initial response rate was 46 percent. Five mailings and seven months later this was raised to 74 percent. A major reason for reluctance to return the remainder was obviously because of a question

asking for total income. While this rate was not bad under the circumstances, if supply analysis had depended on these returns alone the results would have been considerably biased.

When more detailed information is required, a sample survey should be conducted. This was done in the Turkey study with a 10% sample of doctors to obtain detailed information about their preparation and professional practice, to make indirect estimates of physician income, and to assess physician attitudes towards government and rural service. University students were recruited as interviewers, given 10 days of training, and assigned to visit the sampled physicians over a six-week period. Besides the basic questionnaire, respondents were asked for information about classmates not yet located, this proving a highly successful way to track down many previously unknown addresses. As a result of the energetic efforts to locate all those sampled, the final response rate exceeded 97 percent.

Difficulties encountered with occupational groups who are mostly women are particularly serious because of the great frequency of name changes due to marriage. The Turkey survey of nurses illustrates the problem. It was decided to trace a 30% sample of all nurse graduates. Eight months' intensive efforts led to successful tracing of 85%, but only with intensive cross-questioning of known class members. One of the most productive techniques was the holding of a series of teas which served to bring together classmates and friends so that they could exchange information.

Before starting a census, estimates must be made of the number of persons likely to be found. Unless high attrition rates are anticipated,

a reasonable basis for planning is the number of persons licensed (including foreign graduates) in the preceding 50 years, minus estimated net out-migration and deaths. Where life tables or mortality data are not available for professional groups within the country or for analogous population groups, a life table of the general population living in a developed country will usually suffice as a basis for approximation. As the census evolves, the adequacy of coverage must be continuously evaluated. In the Peru study the large number of forms received during the early months of the census through existing health service channels gave the impression that it was proceeding satisfactorily. Later, when the number found was matched against the number expected it became apparent that coverage averaged only about 40 percent, making it necessary to revise census procedures drastically.

The best but most costly method of census evaluation is to compare a master list of names of all those ever graduated or licensed with those enumerated. When the characteristics of a subsample are to be generalized to the total manpower supply (as in Turkey) or a study is to be made of retired health workers, such a list is essential. It proved particularly beneficial in Turkey because it then provided the basis for an up-to-date and continuing system of registration maintained by the Ministry of Health. However, if limited information is to be collected only on professionally active health workers (as in Taiwan and Peru), then a master list of names is not required. If a more detailed survey is later decided upon, the results of the census can serve as the "universe" from which the subsample is drawn.

The compilation and use of a master list of graduates can add considerably to the complexity of analysis, particularly in countries where names are subject to substantial change. Counting only the principal categories of professionals alone, in the Peru study a master list would have amounted to 17,000 individuals, almost 7,000 of them women and hence likely to have changed names through marriage. To avoid the massive job of putting the names and other characteristics on punch cards, grouping them appropriately, and finally matching them with those enumerated to identify omissions, it was decided not to prepare a master list. Later, when the census was complete, large differences were noted in several professions between the number licensed in a given decade and the number found in the census corresponding to the same decade. Although various indirect methods were used to confirm census validity, it would have been very useful to have the names of those not found in order to then make a special effort at verifying their activity status. In retrospect, a method was developed to accomplish this objective without incurring the cost of a complete master list of names. The procedure to use would be as follows:

- (1) Make a list of the names and characteristics (sex, profession and year of graduation) of approximately 10% of all those licensed in the previous 40-50 years, perhaps with stratification to compensate for periods, schools, etc., with relatively few graduates;
- (2) Conduct the census of active health manpower;
- (3) Match the names on the list of those licensed with those found in the census;

(4) Do a special followup survey of those not found in the matching process to confirm census completeness of those professionally active and to identify the status of those not found in the health sector. Information obtained from institutional sources will usually suffice for auxiliary health personnel. The experiences of the Peru study suggest the problems that may arise if auxiliaries are studied in detail. The original study design called for a census of all personnel performing health functions (i.e., excluding only administrative and service personnel). The first problem encountered was to get the census forms accurately filled out. For many barely literate auxiliaries, even the simplest questions gave rise to multiple interpretations. Secondly, the inclusion of more than 10,000 auxiliaries greatly increased the logistical problems of the census as well as the work of coding, punching, and verifying the data. Last, and most importantly, even the simplified data that was ultimately collected proved of only marginal value. What constitutes minimally acceptable preservice or inservice auxiliary training when standards don't exist and few have had any formal training? How does one classify personnel -- by what they were trained to do, by the way they are listed on the payroll, or by what they are doing? Not infrequently all three criteria were in disagreement with each other. In the final tabulations only three types of analyses were made: the numbers of auxiliaries in each of the major personnel categories according to type of institution and employer; the percentage in each of four broad categories of educational attainment; and the percentage who reported three or more months of preservice training for their present job. Although

the latter two analyses were of some use, the additional effort required beyond that necessary for simple enumeration was not justified.

In Nigeria the limited number of trained health personnel and the very high proportion in salaried positions led to the decision to conduct the census only through institutions. Questionnaires were filled out by institutions giving specified characteristics of professional personnel and grouped data on auxiliaries. This relatively simple procedure permits the enumerators doing the institution census to fill out the forms rather rapidly. Though the data are rough, the method is inexpensive.

Who should assume responsibility for doing the census -- the official health statistical agency or those in charge of the manpower study? There are advantages and disadvantages to each alternative and the choice of which one to favor is not always clear.

If at all possible, preference should probably be given to the existing health statistical agency. Statistical personnel already available at the central and local levels can help both with data collection and tabulation. Moreover, since this agency will likely be responsible for maintaining an up-to-date manpower inventory in the future, conducting the census will provide a valuable training experience, as it did in Turkey.

In countries where the existing agency is very understaffed or where there is a large private sector or highly fragmented public sector, it may be necessary for the planning unit to assume direct administrative responsibility for the census. This proved to be the case in Peru. At first responsibility for the census was assigned to statistical personnel

within each of the public sector health agencies, while Ministry of Health personnel had the additional responsibility of covering the private

sector. The very inadequate census coverage that resulted from this initial effort has already been noted. Several problems emerged: the

private sector was too large, particularly in Lima, to reasonably expect

the census to be carried out with existing resources; secondly, most

statistical personnel neither had the training nor necessary support from

their local health officers to be able to undertake a responsibility

that went beyond the compilation of routine activity reports. Local lists

of all personnel to be reached were needed, and efficient mechanism for

the distribution and collection of census forms had to be designed, and

census returns had to be continually checked against the master list to

identify those requiring additional followup. Even if additional personnel

had been made available, the existing administrative structure was too

weak to respond to the demand being imposed upon it.

A third alternative, to be discussed further in the concluding

chapter, is for the planning or health statistical unit to contract with

professional associations to do the census. The benefits of such an

arrangement include both wider diffusion of planning responsibilities

making later plan implementation easier, but also, official government agen-

cies are not disrupted with a burden which exceeds their functional capacity.

Survey of Training Institutions

A survey of training institutions is essential in any manpower

study. One must identify the existing institutions, their past production

and capacity for future increases. It is also important to know the

approximate costs and quality of training.

At the outset it is useful to distinguish between the type of study appropriate for educators in a specific health discipline and for health manpower planners. In the former case the investigation should be both broad in scope and detailed. Educational planners and administrators need detailed information on the qualifications, attitudes and performance of students and faculty, and on curriculum content, expenditures, and the adequacy of equipment and buildings.

Such detail is usually not necessary in a manpower study and in fact can divert attention away from the more obvious issues confronting the manpower planner. This is not to discourage detailed education studies undertaken in conjunction with a general manpower study as long as they are done by educators primarily to satisfy their own needs. Under such circumstances, the manpower planner can benefit from the findings without becoming unnecessarily burdened by detail.

The manpower planner will need information related to past output, future output, and training quality and appropriateness. Although the amount and accuracy of information required will vary depending on the country and discipline involved, certain guidelines can be set forth. The outline given below applies to professional health manpower; a much simpler survey will be indicated for auxiliary personnel.

Past Output. The number (and names, if a master list is required) of graduates and revalidations of foreign degrees, by year and sex, should be obtained for the past 40-50 years.

Future Output. The planner needs to answer two questions: First, what will future output be in the absence of planned changes and second, to what extent can school output be increased (i.e., the elasticity of

output). To answer the first question the following information is

essential:

(1) Current Enrollment. Current enrollment in each year of study, by sex and whether or not the student is a repeater. Any planned changes in the nature and/or length of the curriculum should also be noted.

(2) Dropout Rate. That this factor may be very important in influencing future output is evidenced by the high dropout rates found in many developing countries. In our Peru study the dropout rate exceeded 25 percent in four health professions while in Turkey it was over 44 percent for entering medical students. If the schools cannot provide this information directly it may be necessary to use the time

consuming method adopted in Turkey of checking, name by name, the eventual outcome of each entering student over the past few years. A simpler but less accurate method, used in Peru, is to compare cohorts of new entering students (i.e., excluding repeaters) with those graduating the requisite number of years later. With either method adjustments may be necessary in countries such as Taiwan where a substantial proportion of apparent dropouts are in fact students transferring to other professional schools.

(3) Repetition Rate. If readily available, the proportion repeating their studies should be determined for the past five or more years to determine whether the proportion repeating studies is changing. If there has been little change, this factor is

unlikely to affect future output; contrariwise, a rapidly declining repetition rate will temporarily increase output above what might otherwise be expected and a rising rate will decrease it. As with improving the dropout rate, reducing the repeaters rate offers a major means of improving the productivity of educational institutions. Over 57% of medical graduates in Turkey required more than the prescribed six years to complete the course.

(4) Future Intake. The programmed student intake and any planned changes in admission requirements should be noted. The number of "qualified applicants" (as judged by school officials) and the number of students admitted should be obtained for at least five preceding years. Where the applicant/entrant ratio has been low in a profession in short supply, a special study of student attitudes toward the profession may be indicated.

(5) Foreign Graduates. If the number of foreign degree validations in recent years has been large and erratic, or rapidly increasing, a survey of foreign professional schools may be necessary to anticipate future increments from this source.

This was done in Peru by asking 30 selected medical schools for the number of Peruvian graduates, by year, in recent years, and of Peruvian students currently enrolled, by year of study. Based on past experience estimates were then made

of the proportion of (1) students expected to graduate and (2) graduates expected to return to Peru, in order to thereby project the influx of foreign medical graduates in the coming decade.

The above information answers part of the second question, "By how much can school output be increased?" It was estimated that the output of the present four medical schools in Turkey could be increased by the equivalent of two more medical schools if the dropout and repeater rates were reduced to levels usually found in most parts of the world. In Peru, the lack of enough qualified applicants to fill existing first-year dental spaces would make further expansion difficult. Necessary additional information includes:

- (1) Teaching Personnel. Number of faculty positions budgeted, filled and considered necessary (i.e., desired) for the programmed enrollment. These may be converted into full-time equivalents to permit calculation of faculty-student ratios and inter-school comparisons, and to facilitate projection of requirements. A gross evaluation of the qualitative adequacy of the teacher supply should also be made. The effects of school expansion on the faculty-student ratio should be tested and minimal standards established to serve as one of the short-term constraints on increasing enrollments.⁶
- (2) Financial Resources. Past budgets should be reviewed and the historic trend in student-year and per graduate costs determined. Usually these figures will be only approximate

⁶For a review of available American data on the relationship between class size, the faculty-student ratio, and the quality of medical education see, Paul J. Sanazaro, "Class Size in Medical School," J. Med. Educ., 41:1017-1029 (Nov. 1966). Dr. Sanazaro concludes that based on present measures, larger American medical schools produce an equal product at a lower cost than do smaller schools.

due to the lack of a uniform reporting system.^a Moreover, if enrollments have undergone rapid expansion or contraction (as was the case in many Peruvian and Turkish faculties) the resulting cost estimates may be very misleading. To the extent possible, the future costs of alternative projections of school output should be estimated and tested against projected school income.

- (3) Teaching Facilities. The adequacy of the existing physical plant should be judged in the light of present and postulated future enrollments.

Training Quality and Appropriateness. The difficulties of evaluating training "quality" or "appropriateness" are too well known to need repeating. The manpower planner must, however, look for gross evidence that training is out of tune with job requirements. Two examples of such imbalances found in our manpower studies were the over-training of lab technicians (in a four-year university program) in Peru and the expectation in Turkey that personnel trained only in midwifery would also provide health care to children and adults.

Projection of Supply

Supply changes may be divided into losses and increments. Losses are primarily by retirement, death, and migration.

^a For a good review of problems and progress in the measurement of the cost of medical education see, Augustus J. Carroll and Ward Darley. "Medical College Costs," J. Med. Educ. 42:1-16 (Jan.1967).

Losses.

Death. Theoretically, the most accurate method of age-specific, professional death rate determination is to divide all registered deaths of professionals in each age group by the population of professionals in the age groups. If the professional group is small, the period used should exceed one year. Where a master list of graduates is prepared and carefully surveyed as was done of the 10% sample of Turkish doctors, an accurate calculation of actual death rates can be made directly. Where professional associations maintain mortality statistics, these records offer an alternative source of data for direct calculation of professional death rate.^a In some countries it may even be desirable to combine official registration and professional association data, as was done in Taiwan, to improve the accuracy of the death rate calculations. This method has the drawback of being time consuming if separate classes of health professionals are not distinguished on the death certificates. Where accurate information is not readily available, the direct calculation of professional mortality for manpower studies is not justified.

The second alternative is the use of age-specific death rates for the general population, assuming that the physician death rates equal the general death rates.^b The weakness of this method is that the assumption is a bad one, for physician age-specific death rates are

^aDickenson, F., and Martin, L., "Physician Mortality, 1949-1951" Bulletin 103, Bureau of Medical Economic Research, American Medical Association.

^bFor a discussion of how this was done for American physicians, see Emerson, H., and Hughes, H.E. "The Death Rate of Male, White Physicians in the United States by Age and Casue," Am.J.Public Health, 16:088 (Nov. 1926).

uniformly lower than the general population age-specific death rates. In studies as widely separated in time as 1925 and 1951, and as widely separated in space as United States and Japan, lower mortality for physicians has been demonstrated.

The third alternative, applying a correction factor to the general mortality rates, follows logically from the above observation that health professionals have more favorable rates than the general population. A modification of this method was used in Peru. Since life expectancy tables did not exist, even for the entire population, "proxy" tables were developed based on the mortality experience of white American males and females of the same age as Peruvians graduating from each of the several professions, but for a period approximately ten years earlier. Thus, Peruvian nurses licensed at the age of 20 during the decade 1914-23, were presumed to follow the same mortality pattern as 20-year-old white American females did in the period 1909-11. The assumption is that in each decade the increase in the life expectancy of Peruvian professionals was some ten years behind the American experience.

While objections can be raised concerning which "proxy" mortality curve to adopt, in practice the final estimate of the number of active professionals surviving to a given year will vary little irrespective of the assumptions used. This is because most health professionals retire before they are old enough to be subject to high mortality rates.

We therefore recommend that whenever it is not practicable to construct a profession-specific life table, planners should use a general

population life table with whatever correction seems most appropriate.

Retirement. Retirement is usually the greatest source of loss to the profession. The age of retirement varies from country to country. In India, where the retirement system was designed for the British Colonial Service, retirement has until recently been compulsory at age 55. In other countries, the age of official retirement is 65 or even 70, and in some countries professors never retire. In private practice, where one usually does not formally retire but instead "fades away", the arbitrary setting of a median retirement age is judgmental. We assume that some private physicians will work beyond this median age, while some will retire earlier, and that the "fading away" process is a gradual one continuing over a period of ten years or so.^a

In some countries losses by change of occupation are very significant. In most of Latin America, where a medical degree is as much a mark of an educated man as a key to a professional career, there are many physicians who move into more congenial or less strenuous activities. Determination of such losses may be made by surveys of one or more cohorts of graduates of professional schools. In some countries it is reported that physicians leave the practice of medicine because they are unable to make a living in medicine. This is evidence of defective health manpower planning. Other special cases of change of profession may exist in a given country such as was found in Taiwan where many midwives go into nursing.

^a Ciocco, A., and Altman, I. "The Patient Load of Physicians in Private Practice," Public Health Reports Vol. 58, No. 36, September 3, 1943.

One change of "profession" of particular significance for the female health worker is that of marriage (if marriage may be said to be a profession). Examination of the working pattern of women will show the direct effect that marriage has on employment. An easy method to obtain indirect evidence on this point is to plot the percentage of active nurses (or other female professional) in each cohort of graduates against the year of graduation. When this was done in our Turkey study a bimodal curve resulted, suggesting a substantial return to the profession once the early childrearing years are passed. We also found, however, that a significant number of Turkish nurses married doctors and this usually resulted in their permanent removal from the profession. The value of such information as a basis on which to anticipate future losses and the need for retraining programs is evident.^a

Migration. The last major source of losses to the profession is migration. This is a well recognized phenomenon and for some countries represents a considerable loss. There is migration for training and migration for future work. In practice it is hard to separate these two. If a professional from a developing country undertakes a ten year course in a highly specialized field that has no application to the problems of his own country, he is essentially as much of a loss to his profession during that time as the professional who actually migrates. These problems are further discussed in the chapter on professional migration.

^a For an example of the effect of nurse retraining on the decision to return to work, see "How Many Caps Went on Again?", by Dorothy E. Reese et al., Nursing Outlook, 10:517-19 (Aug. 1962). According to the authors the return rate among 453 inactive nurses given retraining was 77 percent.

Increments

For most countries the only source of new health professionals is the educational and training schools. As we have suggested in preceding sections, the projected output of these institutions should be based on a careful analysis of recent trends relating to student intake, attrition and enrollments. Such an evaluation, made in conjunction with educational authorities, will give a far better estimate of the new graduates to be expected than any statistical extrapolation of past performance.

Other sources of health professionals, while rare in most developing countries, should be looked for and counted. The most obvious example is immigration of nationals trained overseas (as exemplified by Peru). In many newly independent countries of Africa, major reliance has been placed on ex-patriots to provide skilled manpower. Salary levels must necessarily be kept high to attract professionals to government service. Such an expedient must be viewed as a temporary phenomenon until local personnel can be prepared. Also contributing greatly to skilled manpower on a continuing basis are medical missions. In 1962 this source accounted for almost 30 percent of Nigeria's doctors and over a third of the hospitals. The contribution of missions is particularly relevant to serious manpower distribution problems since they are often located in areas of great need, especially those that are isolated and rural. Government data often ignore the presence of such private agencies. Another method of increasing manpower is governmental upgrading, by decree, from one class of health workers to another, as was done with osteopathic physicians in California (U.S.A.). Ayurvedic practitioners

in India who have gone through a special westernized training program are being given the opportunities to obtain full qualification as physicians after a further period of training.

There are six basic factors that determine the extent to which a country can increase its numbers of trained health professionals, five operating at the level of the educational institutions and the sixth having to do with the retention of graduates in active practice. The information needed to assess these factors was described in preceding sections.

The first factor is the availability of qualified applicants for the educational system. In giving dimension to this factor, health planners must take into consideration the demands of other sectors for trained manpower. This is particularly true since in most countries there is an inordinate demand for medical education among the better applicants for professional training. Thus, an abrupt expansion in medical school capacity could have adverse effects on the number of applicants available to the other health professions and to the rest of the economy.

The second factor is the educational plant capacity. With clinical fields such as nursing and medicine, this also implies the availability of suitable "teaching" hospital beds, as well as the classroom and laboratory facilities that are normally associated with educational institutions. In addition to the study of existing facilities, one should review the feasibility of new construction and of adopting more efficient teaching methods so that the present facilities can handle

larger enrollments. One way of improving teaching methods is to introduce timesaving technological innovations.

The third possibility of increasing health manpower supply is to decrease the student dropout and repetition rates.

The fourth factor determining potential for increase is capital: the availability of funds for expanding training facilities and especially for paying the recurring operating costs of professional education.

The fifth factor, especially important because of the long time required to effect a change, is the availability of qualified teaching personnel. The existing supply of faculty must be reviewed to determine whether salary, prestige and other incentives are adequate to attract the additional teachers needed to expand training facilities. As with a limited physical plant, there are methods of extending the existing numbers of teachers by converting some of the part-time faculty to full-time positions.

In some countries increasing the proportion of health professionals remaining in active practice would have a major effect on supply. Except for the predominantly female professions, this method is usually not suitable over the short-run since a high loss rate generally indicates a current surplus of professionals in relation to the effective demand for their services. This factor will be discussed in greater detail in subsequent chapters.

Methods of Projecting Future Supply

Projections are based on assumptions about the future. Sometimes these assumptions are so unquestioned as to make the projection a "safe"

prediction. When this is not possible, particularly in periods of rapid change, more cautious approaches based on alternative assumptions are indicated. Because of the high and variable rates of loss observed among Peruvian health professionals, this latter course was adopted and three projections of future supply were made. In Taiwan where educational patterns seemed relatively stable, we made one projection of supply, our best estimate. Where this failed to meet demand projections, we proposed actions to deflect future supply up or down as needed. In Turkey we used three projections for both nurse and doctor supply. These projections were based on reasonable assumptions of changing numbers of professional schools and changing rates of student attrition and of professional retention, and thus provided the administrator with a basis for making the relevant decisions.

The output of the training institutions can be projected in two stages based on the information obtained in the special school survey. The first stage consists of subtracting the expected number of dropouts from each cohort of students (first-year, second-year, etc.) currently enrolled in a given discipline to obtain the number of graduates. Next, this same procedure is applied to one or several alternative estimates of student intake in future years. If necessary, adjustments are made to account for rapid changes in the percentage of repeating students or in the sex ratio of incoming students.

Once this has been done the planner will have (1) the number of professionals of each type, by age (or year of graduation) and sex, currently available, and (2) the number of new graduates expected during the planning period. These gross supply estimates must now be corrected

for anticipated attrition to derive the net supply of active health professionals. This correction may be done in two ways.

The first method is to make separate adjustments for each cause of loss. Thus, age- and sex-specific rates for death prior to retirement, for retirement, and for migration and/or change of occupation would be applied to each cohort of professionals to determine the number remaining active in the target year. In this way an actual professional life table may be constructed as was done with nurses in Turkey. This method is only possible if detailed and accurate data are available for each of the major reasons for loss.

A simple procedure, suitable for countries where detailed attrition information is lacking, might be termed the "cohort method." In this method the number of physicians, dentists, etc. graduated in each 5- or 10-year period over the past 50 years is compared with the number found active in the health manpower census corresponding to the same cohorts. By this means the loss rate, as a function of time, is obtained. The observed rates are then applied to each cohort of graduates, past and future, to project the supply of active health manpower. The key assumptions of this method are that the baseline census was accurate and that factors affecting the loss rate will continue unchanged. Other than these important limitations, cohort analysis avoids such problems as estimating out-migration, retirement, and death rates since all causes of loss are included.

The cohort method is ideally suited to a normal pattern of attrition. According to this pattern the loss rate is almost negligible during the first few years after graduation, increases slowly during

the next three or four decades, and then increases sharply as each cohort enters the older age groups. Unfortunately, this pattern may not apply in some countries, such as where a profession is subject to a bimodal curve (nurses in Turkey) or a recent rise in the loss rate due to out-migration (physicians in Peru). Under such circumstances the supply projections will need to contemplate alternative assumptions as to the proportion of graduates remaining active over time.

Most manpower studies in the past have concentrated primarily on the analysis and projection of supply. This continues to be the core of any manpower study. In developing countries, great advances will be made in health planning if authorities can merely learn how many and what kind of health personnel they have available and where they are distributed.

Chapter III
MANPOWER DEMAND

Many methods have been used to determine the demand for health workers. In clinical medicine it is generally recognized that if there are many remedies for one disease, usually no one of these remedies is uniformly effective in all cases. The same general principle applies to measuring demand for health workers and experienced judgment is required to decide on the most appropriate approach in specific situations.

In Chapter I, we described four different ways of conceptualizing the demand for health care; that is, what people want, what professionals think people need, what people will pay for, and what professionals consider technically feasible. Although occasionally manpower planning has been based on one or another concept alone, the usual practice is for the planner to borrow elements of each according to his needs.

Approaches to Demand Analysis

In our studies we have found it useful to distinguish four methodological approaches to the analysis of demand which we have termed the biologic, the economic, the normative and the functional analysis approaches. The advantages and limitations of each of these approaches will be the subject of this section.

Before turning to how demand may be assessed, we believe two points should be made explicit. The first, flowing from what was said in the opening paragraph, is that no single methodological approach to demand analysis can provide a satisfactory basis for planning. Each approach

taken alone, is subject to limitations which may lead the planner to make unwise decisions. Conversely, each one has important advantages which the others lack. In our view the task of the manpower planner is to blend the strengths of each into a workable method suitable for the analysis and solution of his own country's problems. This point of view has been a central theme of our monograph.

We believe the second point sufficiently valid to be termed a principle of health manpower planning. Stated simply, it is that people demand health services, not health manpower. There is no inherent demand for doctors or nurses as such, but only for the services they provide. The failure to recognize this simple but fundamental principle has often led planners to ignore important considerations such as manpower productivity and utilization, attitudes towards health care, and costs. In our review of the different methodological approaches we will have occasion to consider this principle in greater detail.

Biologic Approach

In the "biologic approach" to estimating demand, the planner focuses primarily on the question, "What health services do the people require to keep them healthy?" Of secondary importance are the questions of whether these services will be utilized if provided, or indeed whether they can be provided. This approach to planning is based on the following analytical steps:

- (1) Determination of the disease-specific mortality and morbidity rates of a region or country;

- (2) Preparation of norms governing the number, kind, and quality of services to be provided to persons suffering from each disease category;
- (3) Translation of each different unit of service into the personnel time (by type of personnel) required to provide it;
- (4) Multiplication of the projected population, times the disease-specific incidence rates, times the services required per case, times the personnel time required per service, to obtain the total personnel hours needed in the target year;
- (5) Determination of the average hours worked annually by each type of health worker;
- (6) Division of the total hours needed by the hours worked annually per person to determine the total supply of health manpower required.

The classic example of this approach to demand analysis was a study conducted in the United States in 1933 by Lee and Jones.^a After a prodigious amount of effort in devising standards for disease management and estimating morbidity, they arrived at the startling conclusion that the supply of medical manpower in New York State at that time was adequate to meet the total health needs of the state's population!

Although this approach would appear to be a logical way to do health planning, we feel that for many practical reasons it is unworkable. First, there are few countries in the world with sufficiently detailed and accurate morbidity and mortality statistics to provide the necessary base data for this type of estimate. Second, it is by no means clear

^aLee, R. I. and Jones, L. W. The Fundamentals of Good Medical Care. Chicago: University of Chicago Press, 1933.

what constitutes optimal management for most diseases. If resource needs were estimated by aggregating the service requirements for each and every disease to which man is heir -- as was done in the Lee-Jones study -- the task of setting and revising standards would be formidable. Moreover, it is difficult to make useful comparisons among alternative modalities of care for the same condition when entirely different types of health manpower are involved. For example, should one equate the morbidity from diarrhea with a sanitary engineer's time to design a water supply system, or with the services of the nurse and doctor in the rehydration clinic? There is no practical answer to this problem. Third, and most important, even if one could calculate the "need", this is no measure of the public's "demand" for health services. There are many examples throughout the world of unused health services in areas of high need. There are even more of physicians unable to earn a living in the larger cities of developing countries, while the manifest "need" for medical care in these cities goes unmet because the people cannot afford to pay for it. In summary, does it help to quantify the biological need for health care if fiscal and human resources are manifestly unable to meet this need? Is it realistic to assume that government has sufficient control over the health sector to ensure that the requisite amount and kind of health services will be produced? And does government have enough control over the consumers of health services to ensure that they will be utilized? Use of the concept of biological demand to translate "people" into "services", and "services" into "manpower" presumes a degree of control over events that rarely, if ever, exists.

It is important to note at this point that the planning method developed in Latin America represents a modification of the biologic approach to estimating demand.^a Two broad categories are established, the first which includes all those diseases for which techniques of prevention and/or cure currently exist, and the second which encompasses the rest. Within the first category morbidity and mortality rates are studied in detail, and standards elaborated for the services required to combat each disease entity. In the second, planning is based on a more empirical assessment of how the demand for services will increase over time. Although the Latin American method offers exciting new insights into the interrelationships between disease reduction and resource utilization, the validity of this approach for national manpower planning has yet to be established.

To say that the concept of biological demand is still of limited relevance to total resource planning is not to deny its importance in program planning and setting priorities. Clearly, if a tuberculosis program is to achieve success, it must be based on sound epidemiological information in which disease indices are translated into resource requirements. Likewise, if sectoral priorities are to be rationally determined, comparable morbidity and mortality data for different disease groups must be available.

^aSee, Health Planning: Problems of Concept and Method (Pan American Health Organization, Washington, 1965) for a description of the Latin American Planning Method, and, "Planning for Health in Peru -- New Approaches to an Old Problem" (Thomas L. Hall, Am.J.P.H., 56(8):1296-1307, Aug. 1966) for an abbreviated description of the method and its application in Peru.

Economic Approach

The essential question asked in the "economic approach" to demand analysis is, "What health services are people willing to pay for?" Technical questions such as whether the "right" kinds of services are being purchased or whether the amount invested in health is "appropriate", are secondary.

A good example of this method of demand analysis is our Taiwan Health Manpower Study. A random stratified sample of 66,000 persons were interviewed over the course of one year. Demographic, social and economic information was obtained from each household, as well as the number and kind of health services utilized during the month preceding interview. In this way the annual per capita demand for each type of service made by different components of the Taiwanese population was determined. Using these same components, models of the 1973 and 1983 Taiwanese populations were constructed. The appropriate per capita demand factors were then multiplied by the number of persons in each stratum in order to estimate the volume of services of each type to be demanded in the target years. It should be added that these projections were based on the premise that the observed demand for services equals the ability of the present supply of health manpower to supply these services at current prices. This premise is faulty only to the extent that the provision of health services does not represent a perfect market situation.

Parallel with the assessment of the demand for health services, manpower productivity was determined. This was done by dividing the number of services of each type that were demanded per month, by the number of full-time equivalent practitioners engaged in providing these

services. The resulting estimates of current productivity were then adjusted as seemed appropriate in order to maintain real earnings and to provide improved standards of care in the future. Using these revised estimates, the projected demand for services was then converted into the manpower required to produce them. Other methods were used to estimate the manpower demand exerted by the small public sector and the teaching institutions.

This simplified description makes no mention of many of the complexities and pitfalls of the method of analysis. Additional information on the problems of definition of economic levels, component population projection, education projection, economic projections, and internal migration estimation are presented in the detailed report.^a

The principal advantage of this approach to demand analysis lies in its realism. The fundamental assumption is that each stratum of society will continue to demand essentially the same volume of services per capita at a future date as it did in the base year. Since analysis is based on the services actually consumed, the risk of setting excessively expensive or otherwise unrealistic objectives is avoided.

There are important limitations to this approach, however, that preclude its use in all situations. The difficulty of carrying out an effective sample survey would present problems in countries with poor statistical services and inadequate baseline population data. Of less concern is the cost which, although appreciable, is not excessive in relation to the value of the information gained. This approach may not

^aBaker, Timothy and Perlman, Mark. Health Manpower in A Developing Economy. Baltimore: Johns Hopkins Press, August 1967.

be suitable in countries where a major reallocation of resources is planned, or, since supply tends to create its own demand, where there is a rapidly expanding potential for providing services. The validity of this method depends greatly on the accuracy of population forecasts. Since the projected total demand for services is based on the aggregated demand of each component of the population, it is essential that the population projections be reliable not only regarding the total number of persons, but also of their characteristics. In many countries, such accuracy is not yet possible.

The advantages of this method are most apparent in countries where the private sector is dominant in the provision of health care. Here, the government's role in manpower planning is essentially one of assuring that the manpower available at a future date is appropriate in both quantity and quality to meet the spontaneous demand for services. In essence, the government is active in influencing manpower supply, but passive in shaping demand. This is the Taiwanese situation and hence the projection of private sector effective economic demand is most appropriate.

In countries where the private sector is small, or where data are not available to permit projection of demand by multi-variant analysis and component population projection, simplified methods should suffice. One example is our Peru study where it was found that the private sector was almost exclusively concentrated in large cities. Accordingly, private sector demand estimates were based primarily on projected urban growth, corrected for rising income levels. Another is Fein's study^a of the doctor

^aFein, Rashi. The Doctor Shortage, An Economic Diagnosis. Washington, D.C.: The Brookings Institution, 1967.

shortage in the United States. Lacking sufficient data to analyze the interactions between the various demand variables, it became necessary to consider each in isolation.

Specialists are not supposed to think

The Normative Approach

The most frequently used method of estimating demand might best be termed the "normative" approach. As the name implies, this involves setting manpower standards, or norms, which are then used to calculate future requirements. It is important to distinguish between this approach and those just described since the biologic and economic approaches also lead ultimately to manpower norms. With the normative approach, professional judgment plays the dominant role and the focus is generally, though not always, macroanalytical. Norms usually are expressed in global ratios such as one doctor per thousand population or two nurses per doctor, and reflect what the planners think is necessary or feasible as a result of general experience. Conversely, in the biologic and economic approaches the focus is microanalytical. Interactions are measured between defined population characteristics on the one hand, and the services required or demanded on the other. Norms are derived, but secondarily to the detailed observation of what people seem to need or are willing to pay for.

The criteria used by different countries to establish manpower norms have varied widely. The simplest one, used most often by developed countries, is to maintain the existing manpower-population ratio. This objective, which might be termed the status quo approach was used in the

United States to project minimum physician^a and nurse^b requirements, and in Canada, for physicians.^c The major flaws in this method are that it fails (1) to determine the suitability of present ratios and (2) to adequately account for changes in demand likely to occur due to the altered demographic composition of the population.

Closely akin to the status quo approach is the Parkinsonian modification which says in effect, "Our doctors and nurses are busy now, therefore we need more." This method was used in early efforts to set standards for public health nurse staffing in the United States. There were some communities where the ratio of public health nurses to population was 1:10,000. Since nurses in these communities were judged overworked, the ratio was changed to 1:5,000.

Another way to establish norms, frequently used by developing countries, is to make international comparisons. The assumption here is that the country under study will, in the target year, have a demand for manpower equal to that observed in the reference country. The principal weakness of this method is that very few countries are truly comparable. Furthermore, the standard adopted may be more a reflection of national pride than a realistic appraisal of needs and resources.

^aU.S. Public Health Service, Report of the Surgeon General's Consultant Group on Medical Education. Physicians for a Growing America. Public. No. 709 (Oct. 1959), G.P.O., Washington, D.C.

^bNational League for Nursing. Nurses for a Growing Nation. New York, 1957.

^cCanada. Report of the Royal Commission on Health Services. Vols. I (1964) and II (1965). Ottawa: Queen's Printer. (Alternative projections were considered in the Canadian study but ultimately rejected.)

The most obvious advantage of the three variants of the normative approach just described is that of simplicity. In highly developed countries with a generally adequate supply of health personnel, it is not unreasonable to set as a short-term minimum target the maintenance of existing population-manpower ratios. So many imponderables exist in manpower demand projections that to try to improve this baseline requirement with a complex method of demand analysis may be merely to practice self-delusion.

In many situations, however, population-manpower ratios have serious drawbacks. Probably the most fundamental is that it leads planners to focus not on what must be done, but who does it. As we emphasized at the beginning of this chapter, manpower is needed to provide services. If a given manpower ratio becomes the objective, it is easy to overlook problems such as maldistribution, low productivity, and poor utilization that may be of much greater significance than an apparently inadequate number of health personnel, per se. Conversely, when the objective is to provide a given volume of services, these important problems cannot be ignored.

A second limitation, already suggested, derives from the inherent rigidity of population-manpower ratios. The many variables which affect manpower requirements -- demographic, economic, health, social and organizational -- are constantly undergoing change. Continuous and precise adjustment to these changes is obviously not practicable. But neither is it reasonable to adopt a single planning standard, which, because it does not discriminate among different manpower uses, makes even gross adjustment difficult.

The planning method used in Russia represents an attempt to overcome the more serious limitations to the normative approach.^a In essence, Soviet planners have evolved over many years detailed sets of standards, in part based on observed utilization rates and in part on professional judgment. These standards specify the health services necessary for populations of defined characteristics. Complementary standards have also been developed for manpower productivity under differing circumstances. Manpower requirements are then derived following an analytic procedure similar to that described for the Taiwan study.

The Russian system is said to work satisfactorily in practice but it is intricate and exacting. Complaints are often voiced of the large amount of paper work involved in obtaining the necessary data and in maintaining adequate control over the system. Needless to say, manpower planning based on any analytical framework of this complexity should be attempted only by countries with good statistics, a large government sector, and a substantial past experience on which to derive suitable standards.

In our Peru and Turkey studies we adopted variants of the normative approach somewhere in between the population-manpower ratios first described, and the Russian method. The analytical steps used in the Peru study to estimate future manpower requirements are outlined below:

- (1) A preliminary estimate of the number of each of the major types of health services to be demanded in the target year was made based on a projection of historical trends. These projections

^aFor a description of health manpower planning in the Soviet Union, see, Planning and Allocation of Medical Personnel in Public Health Services (I.I. Rozenfel'd, 1961, translated from the Russian in 1963 and published for the National Science Foundation, Washington, D.C., by the Israel Program for Scientific Translations).

- were then judgmentally modified to account for changing rates of urban population and economic growth, and for a planned emphasis on public health and ambulatory care services.
- (2) Planning assumptions were adopted as to the approximate division of resources between the private and public sectors.
 - (3) Staffing standards were developed for the private and public sectors. For private short-stay hospitals only minor improvements over the staffing ratios observed in the survey year were assumed. For the public sector, staffing standards were elaborated for large and small short-stay hospitals, mental hospitals, tuberculosis hospitals, and for the provision of various types of outpatient and rural health services.
 - (4) Resource productivity standards were similarly developed. Those adopted for the private sector were only slightly higher than the observed productivity. Substantial gains were assumed for the public sector secondary to the improved staffing ratios and patterns of manpower utilization being planned.
 - (5) Using the service targets and the staffing and productivity standards, the manpower hours required, by type, in the target year was estimated and converted into full-time equivalent personnel.
 - (6) Other techniques were used to estimate the demand for health professionals in central-level administration, teaching and research, and these totals were aggregated to the ones obtained in step (5) above.

On completion of this last step, the cost of the health sector was estimated. Since the projected increase in the proportion of the gross national product allocated to health (from 4.2 percent to 5.5 percent in 20 years) seemed somewhat high, an alternate demand model was considered. The methods used to estimate costs and to facilitate adjustment in the demand projections are described in a later section.

In Turkey, present demand was similarly calculated on the basis of a disaggregated analysis of existing services. Calculations were based on records of unfilled positions in the multiple health service sectors which were added and related to overall standards. Attempts were made to identify the situations where there still seemed to be unmet private sector demand, both on a geographic and subspecialty basis. The most useful information in this analysis was data on how busy doctors were and how much they were able to charge for their services. Projections of demand then used the normative approach with different sets of standards providing a basis for alternative projections. Four projections were made based on different government policies relating to the expansion of health services. These were:

- (1) A minimum projection assuming maintenance of the existing manpower-population ratios;
- (2) A maximum projection based on manpower-population ratios considered desirable by the Middle East Regional Office of the World Health Organization;
- (3) Two intermediate projections, the larger one based on the progressive nationalization of health services beginning with the neediest Eastern provinces, and the other on a gradual

integration of health services and an immediate expansion of preventive services.

Although the projections differed quantitatively, only the nationalization plan dramatically altered Turkey's existing manpower patterns. As a result, the manpower requirements of this plan differ substantially from those based on an expansion of the existing health system.

Functional Analysis Approach

Experimentation is being carried out on a new approach to the estimation of manpower demand which we term "functional analysis".^a This approach, based on the analytical techniques of operations research, seeks to combine some of the best features of the other approaches already described. The objective is to develop a streamlined methodology for evaluating community health needs and resources through a synthesis of the disciplinary approaches of epidemiology, economics, social sciences and administrative analysis. Such an evaluation depends on gathering relevant data from population and service units sufficiently small to be methodologically manageable. From such biopsy studies norms are then developed for more general extrapolation. These norms can, of course, be checked for reasonableness against expert opinion but should be more firmly founded than those based only on professional judgment. The utilization of such norms then follows essentially the same sequences as were discussed under the normative approach.

The principal focus of functional analysis is on health services rather than on health personnel. A hierarchy of interactions is described

^aExamples of this type of research are the functional analysis studies currently being conducted by the Division of International Health (Johns Hopkins) in Turkey and India.

in which health needs of the community are related to specific health functions, and these in turn are related to even more specific health activities. Out of an analysis of existing patterns of community health care the minimum skill levels required to fulfill the qualitative needs of each activity are defined. Within the economic and socio-cultural constraints which determine the eventual utilization of each category of personnel, a deliberate effort is made to have each individual do only those activities which cannot be performed by someone with less preparation and skill.

Such innovative approaches to manpower planning have become necessary because it has become evident that the intuitive and arbitrary methods for establishing norms which have been used in the past are not good enough. Far more needs to be done in developing methods which can be used for local health planning on a routine and flexible basis.

Estimating Costs

One of the most serious defects found in many health manpower plans is the failure to pay sufficient attention to the probable costs of alternative policies. In some cases this represents an oversight on the part of planners still unaccustomed to thinking in economic terms. More often it is indicative of the very real difficulties inherent in any long range projection of costs. Even in developed countries cost projections are fraught with uncertainties. If accuracy is attempted, baseline expenditure estimates are difficult to derive and even so may have substantial errors. Projections are worse since the planner must not only contend with demand but also with changes in the costs of inputs for the public

sector, in pricing levels for the private sector, and in the rate of economic growth. And once cost estimates have been made, the planner lacks established criteria with which to judge their significance on policy.

In developing countries these problems are greatly compounded. Unstable economic growth patterns, lack of baseline and historical statistics, widely fluctuating price levels, rapid and marked shifts in construction plans, and all the uncertainties inherent in estimating demand combine to make 10- or 20-year cost projections seem almost an exercise in speculation.

In our judgment this exercise is nevertheless worthwhile. Different health systems do bear different price tags and one of the most obvious reasons for low productivity in many countries is the failure to provide enough money to buy the additional resources needed to make the ones already available effective. Although the planner won't attain precision, at least he can explore the impact of different policies on the relative fiscal effort required.

Methods of Estimation

The easiest method of "considering costs" is to use a planning methodology that avoids the problem. As already noted, the approach used in our Taiwan study did just this. The assumption that each population group will spend the same amount in the target year as in the base year is a justifiable one. The only question that may arise is whether the Taiwanese doctor of 1983 will charge the same amount (in real terms) for a given service as he did in 1963. He probably won't, on the average,

but that doesn't matter much. First, the 1983 service will probably be qualitatively better than the one provided in 1963. Second, and more importantly, although the average fee will have increased, average per capita income will also have risen. Averages contain a spectrum extending from one extreme to the other and as the number of persons paying low fees declines, so too will the number of people with low incomes. The net effect will be to increase the number of services per capita, the fee charged per service, and the income per health worker, while maintaining approximately the same relative financial burden on each component population group in the target year as in the base year.

The Taiwan approach is applicable to relatively few developing countries and even in these, other methods may be necessary to estimate public sector costs. Methodologies of cost projection can be divided into two broad groups depending on whether they focus primarily on the services to be provided (outputs) or the resources to be used (inputs). Although theoretically the two approaches are directly interchangeable through the use of appropriate productivity standards, in application they present important differences.

Services Provided. As the name implies, cost estimates based on this approach are obtained by multiplying the projected unit cost of each type of health service, by the number of such services to be produced, and then aggregating the various totals.

Conceptually simple, this method presents several problems. First, there is the difficulty of determining unit costs for those services with shared inputs. The task of deciding how to allocate the costs of intermediary services (e.g., administration, laboratory) among the final

services (e.g., hospitalization, doctor visits), while not insuperable, does take considerable time.

A second difficulty is presented by those activities such as training, central administration, research, and some aspects of public health that cannot readily be divided into service units. Other methods are needed to include the costs of such activities.

Lastly, this method is obviously not usable when demand projections are not based on an estimation of the services to be provided.

Resources Used. A more common approach is to estimate the costs of inputs, or resources used. Our studies in Turkey and Peru and the Latin American planning method illustrate three ways in which this approach may be applied.

In Turkey, estimates were made of the operating costs of each of the different types of government facilities planned and the costs multiplied by the number of each to be available in the target year according to the alternative demand projections. The several cost projections were then compared with projected public sector income to test the feasibility of each alternative. No estimates were attempted of private sector costs.

The Latin American method refines this procedure one step by focussing not on "institutional inputs" but on "service inputs". Here, the units of measurement are the "instruments of health policy" such as the doctor-hour, bed-day, and immunizer-hour. In each case all the resources, manpower, material and capital, are counted in order to determine the total cost of each instrument. The numbers of instruments required in the target year are determined by dividing the projected demand for services by the appropriate productivity standards. Costs

are then calculated by multiplying the cost per instrument times the number of instruments to be provided. Since this method shares some of the characteristics of the "services provided" approach, it meets with some of the same problems.

The method used in Peru looks directly at the inputs themselves without any intermediate unit of measurement. Base year manpower costs were estimated for the entire sector by multiplying the imputed average income for each personnel category times the number of persons in each category. To the product were added the estimated national expenditures on goods, services, and capital investments. Projected personnel costs were derived similarly and assumed a three percent annual increase in real salary income. Capital investments were based on the rate of construction necessary to accommodate the projected manpower supply. Lacking criteria for independently projecting expenditures on goods and services, "fixed factor proportions" were assumed.^a By counting all manpower and other inputs this method has the advantage of including the costs of activities (education, research, etc.) that might be missed according to the procedures described previously. This advantage is balanced, however, by the somewhat greater difficulty of disaggregating costs into public and private sectors, or by object of expenditure.

^aThis concept, borrowed from the economist, presumes that the proportion of the total cost represented by factor "X" at a known point in time will be the same at other points in time. Although the assumption is weak in this particular case, it is not apt to adversely affect the final results since "goods and services" represents only a fraction of sectoral costs.

Significance and Limitations of the Results

Regardless of the method used, the next step consists of comparing the cost projections with those of sectoral or national income. For the long range projections required in manpower planning the national income comparison is usually preferable since fewer variables are introduced. Otherwise the planner must anticipate not only the rate of economic growth, which he must do in any event, but also government tax policies and priorities regarding the distribution of revenues among the several sectors. It should be noted, however, that for shorter range program planning the sectoral income comparison is clearly preferable.

Assuming the planner finds that the manpower supply projection under consideration will result in five percent of the gross national product being allocated to health, how can he use this figure? Is it too much, too little, just right, or just wrong? It may be "wrong", but without considering other factors, little can be said of its appropriateness. No sacred figure exists that says how much should be spent on health. Each nation must decide this question for itself based on such considerations as (1) the priority accorded health among the competing claims on the national income, (2) the types of health services given highest priority (e.g., high cost medical services or low cost preventive services), and (3) the amount spent in the base year.

For want of better criteria, the last-named is probably the most useful at the present time. The case of Peru is illustrative. It will be recalled that the initial demand model projected a rise in the proportion of Peru's G.N.P. to be spent on health from 4.2 to 5.5 percent in 20 years. Assuming for now that these estimates are acceptably accurate,

this equals the percentage rise (30 percent) that occurred in both the United States and Canada during the 1940-1960 period. Based on this comparison that Peruvian projection could be considered feasible. But, if one compares the Peru of 1964 with the North America of 1940, the projected rise might be reasonably questioned as excessive. Peru has other very pressing needs in agriculture, transport, education, industry and housing that also deserve high priority. Since all the major sectors can't rapidly increase their share of the economy at the same time, it therefore seemed useful to consider a lower growth rate alternative for the health sector based on a more moderate expansion of government programs

The question of whether the cost estimates are acceptably accurate or not deserves further comment. In our experience, the data limitations of developing countries make it unrealistic to expect current expenditure estimates to have much less than a 15 percent margin of error. When this is matched by a similar error in the national income estimate, the derived value for the health sector's share in the economy may be up to 30 percent off the true value. By the time a baseline figure with an error of this magnitude has been projected over one or two decades, the resultant monetary projection may almost be meaningless.

Curiously enough, this problem need not seriously limit the usefulness of such projections if the same method has been used to calculate both current and future costs. The presumption is that if there is an error in the baseline estimate, the projected cost will likely have a similar error both as to direction and magnitude. This would not be enough if the planner had to know precisely how much money each alternative would cost. But since he is primarily interested in the relative fiscal

effort each requires and in the rapidity with which the health sector's demand on total resources will increase, approximate figures will suffice.

By extension it can be argued that where reliable data on current expenditures are lacking, the fiscal implications of alternative policies can be tested by making use of a relative value scale. Arbitrary, but reasonable values (on a relative scale) would be assigned for (1) the annual incomes of the several manpower categories, (2) the costs of facility construction, and (3) the proportion of the total amount spent on goods and services. Using these assumptions a current expenditure estimate would be derived. The same procedure would be used to calculate the future costs of the several policy alternatives, thus allowing the differential rates of change to be compared.

One factor, which, if not taken into consideration may lead to seriously underestimating future costs, is the effect of rising incomes. The problem can be summarized thus: If there is a rising per capita G.N.P., the fruits of economic development can either go to higher incomes, or to savings (and ultimately, investments), or to some combination of the two; if the "savings" alternative is chosen, aggregate real incomes will remain stable and future input costs will equal current input costs; if, however, the present generation wants to benefit from the rising prosperity -- the far more likely choice -- then future input costs will exceed current costs. In other words, a doctor costing the economy a given amount today will likely cost more ten years from now, even though the services he produces may cost the same or even less, depending on what happens to productivity.

Peruvian cost projections indicate the importance of this factor. If real incomes are assumed to remain constant over the entire planning period, no change would occur in the proportion of G.N.P. allocated to health (4.2 percent) despite a projected doubling in the number of services produced per capita. Conversely, the three percent annual rise in real incomes actually assumed, when applied to the same manpower projections as used above, raises the sectoral participation to 5.5 percent. Thus, depending on the value assigned to this factor, the planner can find himself working either with a readily attainable target or one that will require great efforts.

The basis for estimating this factor will, in most cases, be historical data obtained from the central bank, financing ministry or national planning agency. In the case of Peru, data available over the previous 15 years recorded an average annual real increase of 3.5 percent in non-agricultural wages, of 4.0 percent in non-governmental salaries, of 3.4 percent in governmental salaries, and of 3.0 percent in agricultural wages. One-third of the labor force working as small independent farmers experienced a much lower rate of income growth. According to these figures one might assume that health professionals in Peru would increase their income by almost 4 percent annually and paramedical and auxiliary categories, by about 3.5 percent. Three percent was instead chosen, partly because "decimal point" precision was not realistic, and partly because government policy was committed to increasing the income of the lower economic groups at the expense of slower income rise for the rest of the population.

Another important question, not yet mentioned, is who pays the bill for health care? Even though the cost projection may be within the country's economic capacity, if the intra-sectoral responsibilities for providing care don't correspond to the fiscal resources, problems will likely arise. Specifically, assume the case of a developing country with a small health system approximately equally divided between public and private sectors. Plans call for a rapid expansion of the public sector and manpower targets calculated accordingly. Planners compare the projected cost of the health sector against the anticipated economic potential and conclude that the services can be paid for. But can, or will, sufficient public funds be allocated to finance the plan. If they are, and under the conditions postulated, the government may end up spending too much on health and other sectors will suffer. Conversely, if the funds are not made available but the manpower is trained according to the original plan, serious difficulties may develop. With public sector demand low, some of the excess manpower will enter private practice, though likely a substantial number will migrate or be marginally employed at low salaries by government agencies. Assuming the economic and cost projections were correct, the solution is always at hand of shifting a greater share of the fiscal burden onto those best able to pay. In practice this is often difficult once the higher income groups get used to receiving what is in effect a heavily subsidized government health service. Summarizing, in making cost projections planners should be careful to consider not only the total amount to be spent on health, but also any marked shifts in the incidence of the fiscal burden between the public and private sectors.

Conclusion

In concluding this section we wish to stress two points. First, in any manpower study not based on the economic approach to analysis, the attempt should be made to estimate the relative fiscal effort required by the alternative policies under consideration. If the results are viewed as guides to action, to be interpreted in the light of professional judgment, the errors they may contain will not lead one far astray.

Secondly, very little is conclusively known about the projection of health costs over an extended period of time, even in developed countries. Research is urgently needed in this field to improve the inadequate methods now available. The best results will evolve out of prospective studies where costs are predicted using a variety of means and the results observed over time. In the meantime, however, there is a wealth of historical data available that could be used to empirically test the accuracy of alternative methods. All that would be needed is to see how close each one comes to predicting present costs based on figures available five, ten, or more years earlier. The results of such studies would measurably improve health manpower planning.

Part III

ISSUES IN MANPOWER PLANNING

Chapter IV
EDUCATION

1. Educational Planning

Time Perspective in Educational Planning

A principle characteristic of the educational process is the time lag necessary to produce professionals. In manpower planning it is not only important to recognize the long period required to train professional personnel, but the even longer gestation period needed to develop an educational institution. In educational planning, therefore, the lead time for production of professionals requires making supply and demand projections over at least a fifteen-year period.

One reason why ancillary training is appropriately emphasized in health manpower planning for developing countries is that the lead time is significantly shorter than for professional education. Each phase of the process can be reduced significantly. The training program itself is one-to-two years, based on a limited general education. The time needed to develop the educational institution is also considerably shortened, in large part due to lower educational requirements for faculty.

Quantitative-Qualitative Dilemma

Throughout the process of educational planning, an appropriate balance between quantity and quality must be maintained. It is all too easy to polarize thinking in favor of one alternative or the other even though they are usually reciprocally interrelated.

Quantitative Aspects. A major requirement of educational planning for manpower development is that some degree of flexibility be built into the system to permit the shifting of output to meet altered demand. Production of trained people, however, cannot be as readily adjusted as changing the rate of production on an automobile assembly line. Industry can adjust to market demands merely by delaying production or modifying input. When people are involved, quantitative output is far less subject to control.

For example, it is extremely difficult to turn off the tap of manpower flow in a specific professional or occupational category. An occupational group seems to have an intrinsic life of its own maintained largely by the compulsive loyalty of members of that group to their own occupational future. They will fight vigorously to ensure that the production of more of their kind is not reduced. A biological drive seems to be operating similar to the struggle for survival of any species. Biological reproductive mechanisms develop evolutionary adjustments to cope with attrition rates of population numbers. A similar principle seems to operate with occupational groups. Planning for manpower development has many of the same problems now being encountered in national programs for family planning.

On the other hand, the major characteristic of the manpower market has in general been one of scarcity. So far, there has seldom been an evident population problem of health personnel. The main concern is deciding which categories of health personnel need to be increased most urgently. Public policy then promotes the opening or expansion of educational institutions and the creation of incentives to attract new

candidates to the priority occupations.

There have been instances in which particular categories of health personnel found themselves superceded by the development of higher professional categories. Classic examples are some types of medical assistants, such as the licentiates in India and Behdars in Iran, which were developed for rural health services. The sequence in Iran is particularly instructive. The Teheran medical school was established on the French pattern of medical education to produce doctors for the urban elite. In the 1940's Behdar schools were opened to train a new category of medical practitioner for rural populations. Behdar schools were opened in eight provincial capitals. Training lasted four years, in contrast to six years for physicians. As Behdars completed their six years of compulsory government rural health service, they gravitated to the cities to practice. An immediate professional conflict with established medical practitioners arose. The dilemma was particularly acute for the faculty of Behdar schools, who found themselves with divided loyalties. Turning off the tap became an obvious necessity. In this situation the best solution seems to be to upgrade the category. It is almost impossible to actually eliminate an occupational category or to downgrade it to a lower level. The group will, however, usually accept the alternative of being upgraded to the next higher level. In Iran, therefore, the Behdar schools were converted into medical schools, and Behdars themselves were offered the opportunity to take abbreviated courses to obtain full medical qualification.

The licentiate system in India went through a similar sequence spread over a much longer period of time and with a more complex causation.

A major and little recognized consideration is that during the prolonged period of British rule in India, the licentiate degree acquired a considerable stigma of colonial domination. Licentiate physicians were originally trained to be assistants to British civil surgeons. Their numbers were gradually expanded to serve as rural medical practitioners, which in itself carried a second grade connotation. When India became independent there were far more licentiate physicians in practice than fully qualified MBBS graduates and many of the licentiates were widely recognized to be excellent doctors. The difference in their training was four years as compared with six years of professional education, with the licentiate training being in general more practical. With independence, action was promptly taken to abolish the whole licentiate system. Licentiate doctors were given the option of taking a two-year shortened MBBS course. A similar sequence occurred in Nigeria with abrupt termination of the excellent training of the Yaba School after the new medical school at Ibadan was started.

India is now facing a difficult decision of whether to continue training health visitors for the rural health center program or to shift to more qualified public health nurses supported by a new category of auxiliary nurse midwives. Nursing consultants have established official policy favoring the latter alternative. It has, however, been difficult to actually stop production of health visitors because they have been widely recognized to fill important functions not yet being covered by the other two new categories.

The experience in the United States following the Flexner Report is also instructive. Up to 1913 there had been uncontrolled and

excessive production of doctors. Most were poorly educated. Proprietary medical schools, operated for profit, had a particularly damaging effect on the reputation of the medical profession. As a result of the Flexner Report, the number of medical schools in the United States was abruptly reduced. The expanding demand for doctors continued to be met by the pre-Flexner doctors, especially in the rural areas and in small towns. Medical education was able to concentrate on expansion. As brought out so well by Greer Williams,^a the net result was that over the next generation, as the pre-Flexner doctors died, a doctor shortage gradually became evident. Though it sounds heretical, the Flexner doctrines are now out of date because they compulsively pressed medical education in the United States toward higher and higher quality, while the mass needs of the people were increasingly ignored. Since World War II, much of the now serious lack has been compensated for by foreign medical graduates immigrating to the United States. Many of these doctors are academically as poorly equipped as the pre-Flexner doctors. It is now evident that the pendulum swing to quality at the expense of quantity of the Flexner revolution was too great. The whole process now stands as an example of poor planning. The profession over-reacted to overproduction and the resultant underproduction was permitted to continue too long.

Quality and the Definition of Educational Objectives. Fundamental to qualitative improvement is a clear understanding of the functions for which graduates are being prepared. This definition of objectives is far more important in professional education or occupational training than in general education.

^aWilliams, Greer. "Quality versus Quantity in American Medical Education". Science, 153, (3739): 956-961. (Aug. 26, 1966).

Occupational objectives must be clearly stated in terms of work to be performed, the level of proficiency to be acquired, and the degree of specialization to be permitted. The type of work to be performed may be roughly categorized first of all in terms of degree of responsibility and complexity of tasks. In the health profession, one is always faced with the life-and-death responsibility for people. The range of tasks needs to be categorized, extending from those that are purely routine and relatively reflexive, where the need is for minimum understanding and maximum skill, on through situations in which a high level of perception and wisdom is required for decision-making by those ultimately responsible.

An important distinction in levels of educational preparation can be expressed by recognizing the difference between education and training. In education, primary emphasis is on developing the breadth of knowledge and understanding which will provide a basis for independent decision-making. The educated professional develops judgment, attitudes and values which lead people to trust him with their lives and well-being. By contrast, training refers to the development of fairly routine skills which can be carried out with a minimum of decision-making and judgment. Certain acts and procedures can be built into the reflexive behavior of trained individuals so that they can perform with a high degree of proficiency. They do not decide which measures should be applied in particular situations. They are prepared only to follow decisions made by others and to insure that the sequence of steps of the appropriate measure is completely carried out. It is a commonly observed phenomenon that a person who is well trained can often perform a detailed and complex maneuver better than a person who is broadly educated.

Part of the process of educational planning should include classification of specific functions along this education-training spectrum. Decisions about the manpower level appropriate for each function should then be made according to the basic principle of having each category of personnel responsible only for those tasks which cannot be done by less prepared individuals. The educated professional should work out routines to meet particular functional requirements and ancillary personnel should be prepared to carry out these routines systematically. A related problem in the definition of functional objectives is to determine the degree of specialization required. Again a spectrum must be visualized ranging from specialist to generalist tasks. The spectrum applies equally to professionals and auxiliaries. The specific problems are, however, different.

In developing countries the specialist/generalist dilemma in medical education is illustrated by a fundamental semantic disagreement over the use of the term "basic doctor". This word was originally used in the United States to crystallize the major objective of undergraduate medical education. It was intended to indicate that the purpose was to produce a medical graduate who had acquired the core foundation of disciplines, understanding and skills required by any doctor prior to specialization or the attainment of a general clinical competence. He was merely supposed to acquire the basic preparation and then learn how to apply the knowledge in the internship, residency programs and specialized training. When medical educators in developing countries use the term basic doctor, it is obvious that the meaning is entirely different. Their interpretation is that the basic doctor should be

ready to work as a fully qualified doctor. He is expected to be a generalist, with sufficient background in applied work to immediately take responsibility. This expectation holds even though the relatively theoretical education in most developing countries does not provide the necessary experience. The distinction is basically that the purpose of medical education in developing countries is to produce generalist doctors, while in more affluent societies the objective has shifted to producing mostly specialists. If the generalist decides to specialize, he will have to go back and pick up the specific areas of basic science necessary to his specialty. On the other hand, the basic doctor of the affluent societies is supposed to have sufficient preparation in the basic sciences to enable him to move in any direction. The assumption is, however, that he will learn the applied arts of medicine only in the area of his specialization. The term often used for the latter concept is that of a "blast cell" graduate.

At the ancillary level, also, the specialist/generalist dilemma is acute. A basic issue is whether the health services are to be structured around a categorical disease approach or a comprehensive care approach. For categorical disease programs such as malaria eradication, leprosy and tuberculosis control, and nutritional campaigns, large numbers of individuals are needed who are trained only to carry out a specific group of tasks. They are highly specialized in certain skills but their range of activities is limited. Built into this system is the assumption that as specific diseases come under control, personnel can be retrained to cover additional fields of activity. In practice, the range of most such programs eventually covers only a small group of diseases.

The alternative is to train a low-level generalist to work as the primary contact with the general public in a comprehensive care service. The generalist auxiliary serves as the initial screen for all routine curative and preventive health services. His training is also limited to standardized skills, although they cover a considerably wider range of alternatives than those provided to the low-level specialist. It is generally agreed that such a system will work only if the general health worker is thoroughly trained to identify those conditions which he should not attempt to handle. Routines must be established so that any case which does not fall into easily recognized categories can be referred to more adequately staffed health services. For instance, if the temperature is above a certain level or if the condition has not improved in a specified number of days, the referral must be made automatically.

In both systems major reliance is placed on regular and consistent supervision by more highly educated professionals. In fact, any system using auxiliaries works only as well as the supervision provided.

There is, however, the special case of the remote and isolated rural area where the normal pattern of supervision cannot be established and communication is difficult. Even in such a situation, there have been many instances in which low-level generalists have functioned well. Perhaps as a result of the additional responsibility placed upon them, many of these individuals have been particularly effective. There are, however, built-in hazards due to the inability of many auxiliaries to adapt. It is especially important to work out new technological innovations, such as two-way radio sets, to develop and maintain a regular

pattern of communication with health professionals.

In educational planning a general principle that has been repeatedly demonstrated to be of fundamental importance is that the number of categories of personnel should be kept to a minimum. It is all too easy to multiply auxiliary categories to fulfill specific functions. This oftentimes produces health services which have wasteful duplication of effort. It is probably better psychologically to strain the capacity of health workers to cope with more than they can readily do, than to limit activities to the point where there is not enough to do.

Once the number of professional categories has been decided, there should be clear definition of responsibility between them. Many of the problems of friction and poor working relationships between health personnel arise from the lack of such clear definition of their roles.

Some side benefits resulting from a clear definition of educational objectives have to do with student selection and curriculum development. In the first case there is a highly desirable self-selection of students based on the natural tendency to pick the occupational level and type of work which suits them best. It is, however, extremely important to have vocational guidance and information about jobs available to the appropriate educational pool where the selection of careers is being made.

Curriculum development obviously follows naturally from a clear definition of objectives. Once it is definitely known what the graduate is supposed to do, the process of building the necessary steps of preparation into the student's experience becomes manageable.

Improving the Utilization of Educational Institutions

Making the Best Use of Faculty. The faculty is the most important element in the educational enterprise and particular attention should be given to maximizing the productivity of each member. Facilities, budget, schedules and other arrangements should be attuned to the fundamental objective of providing an optimum opportunity for useful communication between faculty and students. The faculty should be relieved of non-essential burdens so that they are available to stimulate the learning process of students through direct personal contact.

A fundamental consideration that must be solved in keeping with local conditions and needs is the question of the relationships between the educational programs for various health categories. Professional education tends to be concentrated in universities and a profitable and close interchange within the academic community usually develops. Middle- and lower-level training often is not associated with general educational institutions. Because the primary emphasis is on the development of skills, the locus is usually as close as possible to the working situation. The various middle-level courses on technical and patient care activities in hospitals are typically developed in hospital schools. The training of sanitary inspectors and other public health field workers also tends to be included in the working program. Both middle- and lower-level technical training programs are usually directly under the Ministry of Health for the obvious reason that this maximizes the practicality of the training.

A generalization that seems appropriate at this time is that students should get as much of their general science and preparatory

education in the general education system as is possible. A major advantage is that this permits delayed decision about career choices. The technical training schools then can concentrate more effectively on that part of the total educational experience which relates to required working skills. The system whereby technical training institutions provide a prolonged period of basic education is in the long run probably less effective than a division of responsibility. Conversely, if a general educational institution is going to assume full responsibility for training, there is danger that the practical experience will be too short and of dubious relevance. This generalization also applies to professional and auxiliary courses.

A related concern which must be solved in keeping with local conditions and the total faculty work load is that of full- or part-time status. With all of the pressures in society for increasing specialization of function, it is not surprising that teaching is increasingly recognized as deserving full-time specialization. The educational system, as the major producer of health manpower, is itself in the position of exerting a strong demand for the most highly qualified manpower. The basic concept is that the faculty serves as a sort of template to facilitate the replication of health manpower. However imperfect the process, it carries the obvious conclusion that teaching faculties should represent the best professional models. Since individuals such as these are rare, it is logical to maximize their educational impact by making them full-time teachers. Particularly at the professional levels of education it is also generally accepted that these individuals should be leaders in research. As a result they often lose contact with day-to-day practice.

The service role of teachers is often considered secondary to their teaching and research responsibilities. In developing countries, however, where the medical school may be the major source of medical care for the elite, it is not uncommon for faculty clinicians to spend most of their time in service functions. This also relates naturally to the general concept that the basic doctor produced in such educational systems should be prepared for immediate practice upon graduation. There is considerable justification for the faculty to spend much of their non-teaching time in clinical practice and their research should be oriented to the practical needs of their own society.

Such logic may soon lead to a dangerous conclusion. If it is better for clinical teachers to concentrate on clinical practice so as to present an appropriate role model to students, then it is thought that they might as well be on part-time salary. This represents a tremendous financial saving for medical colleges in developing countries. The most highly qualified clinicians can be employed without having to compete economically for their services since just being a professor ensures maximum private practice income.

Several dangers are inherent in such a system for developing countries. One is that a lucrative private practice actually subtracts from teaching time with students. The fact that these teachers are not in the medical school or in association with students during the time they are earning their money means there is little direct benefit. This problem can be somewhat remedied through the system of geographic full-time in which the private practice is conducted within the teaching hospital so that both the professor and his patients are part of the educational system.

Perhaps the greatest hazard of the part-time teacher-private practitioner arrangement is that students tend to get a distorted sense of professional values. The most respected role models become the most affluent clinical professors with their long black limousines and luxury living standards. In many developing countries the potential economic rewards lead to a tendency to compromise ethical principles relating to patient care. Even for professors, inflation of fees is usually less apparent than the provision of unnecessary, and often dangerous, therapy. Teachers as professional role models should transmit the values most needed in the developing country such as a willingness to serve in rural areas, a community orientation and social responsibility.

An appropriate balance can often be achieved by having a core of full-time faculty who are truly the professional leaders and are paid appropriately. The faculty can then be supplemented by a much larger number of part-time clinical teachers who are available for the total teaching load without being an excessive financial drain on the school.

Because health manpower planning deals with various levels of education, an important generalization is that the faculty level should be appropriate for the training level. In many developing countries part-time medical practitioners tend to monopolize most teaching positions in schools for middle- and lower-level health workers. This is not desirable because inherent in most education is the tendency for the teacher to try to replicate in the student small images of himself. It is more appropriate to use practitioners of the same occupational group being trained, suitably prepared for their faculty role, to provide much

of the basic training. Doctors can then be used for some general teaching, especially as it relates to preparing the students for eventual team relationships in health work.

In spite of the general statement just made, there is the contrary generalization that joint use of faculty should be made wherever possible. This applies particularly to the teaching of basic sciences and general subjects required by several occupational groups. As already indicated, much of this may be included in the general educational system. If general educational activities are included in training schools, then efficiency should be increased by joint use of the limited number of teachers available for this type of teaching. In fact, some of the most constructive, recent efforts in educational research have been to develop methods of increasing teaching efficiency through programmed instruction and the use of audio-visual and other technological advances.

The most important part of a training program is obviously the practical or field work. It is important that this activity be developed in close cooperation with actual field staff. Here part-time teachers with joint appointments in service agencies are almost essential. Students learn much more than the obvious technical skills from seeing respected members of the occupational group which they hope to join actually working in daily routines. An added benefit from this sort of interaction with the field situation is that the full-time faculty, by being exposed to the problems of consumer agencies, become more practical in their orientation.

Making the Best Use of Facilities. A question to be decided at an early stage in educational planning is the optimum size of the educational facility. There are few clear-cut research findings on this basic

question. A gradually accumulating store of impression and information represents the best evidence now available. Medical schools have tended to maintain small classes to ensure high quality education with maximum student-teacher contact. It seems clear now that classes of 150 to 200 can be handled without educational loss.

The danger of shifting to a more didactic form of teaching must be guarded against if class size is increased. Certainly some countries have had medical schools with classes ranging from 1,000 to 5,000 which were caricatures of didactic and theoretical teaching, with little relevance to practical learning. The practical sessions to learn skills must be conducted in small groups in close personal relationships with teachers and the working situation.

In general, the various auxiliary training schools should have smaller classes because of the greater stress on practical experience and learning skills. Since the training is much shorter than professional education, it is still possible to turn out large numbers to meet urgent manpower needs. Much more needs to be done to find out how big a class can be before teaching effectiveness is seriously impaired. Again, it seems probable that classes of 100 to 200 students can be accommodated for theoretical learning if field and clinical facilities are adequate to provide individual practice opportunities.

To save facilities, it is often desirable to use laboratories and libraries jointly. Field activities similarly can be based on combined community teaching facilities.

A constant danger is the tendency to expect too much of limited facilities, especially when the mass needs of technical and auxiliary

training interfere with professional education. In some medical schools in India, for instance, departments of preventive and social medicine are also required to handle classes for training 200 sanitary inspectors at a time, which seriously interferes with their basic responsibility to medical students. The joint use of facilities, therefore, must be balanced so that apparent efficiency does not interfere with quality of education.

Education for Community Service

Throughout this monograph the theme is stressed that education of health workers in developing countries must be focused on health problems and activities relevant to local needs. Educational patterns cannot be transferred directly from systems of education in other countries. This general statement is easy to say but hard to implement. It is now evident that the most important single component of local adaptation is to develop an understanding of the local community and the best ways of serving it as a whole.

Instead of the tripod, teaching, research and clinical service, medical education now has the fourth leg of service. A major obligation of the medical school is to develop a community orientation in all physicians. In many developing countries a doctor's main responsibility is to lead the health team in a rural health center serving 10,000 to 100,000 people. He must learn that his patient is not only the "whole person" as now taught by modern medical schools, but also the whole community. This requires him to develop a new orientation toward priorities. He has to make difficult choices about how to allocate the limited health resources available with the good of the group being

the central objective rather than for a single individual. The most difficult choices are in the allocation of his own time. As a community doctor, he must learn to use the varied social and political forces that are available to any community leader.

If the medical school accepts the responsibility of training community doctors, it must itself be community oriented. This is done best by taking responsibility for the total health care of a geographical region.

Community teaching can only be done when community facilities are developed in the same way as are teaching laboratories and clinical wards. Organization of such community facilities is not only expensive and difficult, but also the whole idea is still so new that appropriate techniques have yet to be designed. The most frequent pattern at present is to use teaching health centers in rural and urban areas. A primary objective is to get students into homes where they can learn about the ecological interactions with health factors. Much use is made of household surveys, followup visits of clinical patients to the homes, and epidemiological studies. If the health center area is small, a common experience is that families are soon subject to excessive attentions and become resistant to home visits. To be polite some villagers develop a stereotyped set of responses which become almost meaningless. Because of such problems the present tendency is to organize health training areas covering a far larger range of activities and types of facilities than the original teaching health centers. There are in fact a number of experiments around the world in which medical schools are assuming responsibility for all of the health facilities in whole districts or provinces.

During the field training health personnel can learn to work together as a team. This sort of emphasis on team teaching has been particularly emphasized at the Gondar School in Ethiopia. The health officers, the community nurses and the sanitarians are taught together throughout their educational experience, but especially during their community work. Other less ambitious demonstrations also show that within the supervised framework of a community teaching health center, each category of health personnel can learn to respect and cooperate with the others.

A major benefit of regionalization of health services is that it provides opportunity for continuing education.^a The basic concept is that not only can all health training institutions use the facilities of the regions for their demonstration, teaching and research, but more importantly, the whole regional system should provide continuing education for all personnel employed. There should be a constant two-way flow of health personnel and patients at all levels in the regionalized framework. Centrifugally, there should be a regularly scheduled sequence of visits of curative and preventive specialists who rotate among the various units. Health workers in peripheral units should collect their problems (whether patients or community situations) to discuss with the consultant when he comes. Each problem can be handled as an educational device. The educational benefit is not limited to the field personnel, since consultants also learn a great deal even though they may protest that they are wasting their time in travel and seeing relatively few patients. They may also protest that they are being forced to dilute

^aSeipp, Conrad, (ed.). Health Care for the Community: Selected Papers of Dr. John B. Grant. Baltimore: The Johns Hopkins Press, 1963, pp. 93-140.

their professional standards since adequate facilities or technical resources are not available in the field situation. They reveal a constant tendency to insist on taking patients back to the hospital for adequate study. They can't understand patients' reluctance to leave their village environment. The necessity of coping with difficult village patients under limited and restricted conditions can, however, be a very profitable exercise for the hospital specialist.

A steady centripetal flow of field workers for short courses and inservice training programs is equally important. Their participation helps to keep the teaching practical, and innovative approaches from the educational center can be promptly diffused throughout the health services.

An additional educational instrument that is usually ignored is the use of the record system for continuing education. Referral of cases and problems from the field should have a regular system of recording findings so that the educational institution will have relevant information about the environmental and ecological conditions in which the health problem started. Conversely, the records going back to the peripheral units from the referral center should carry sufficient information to provide effective learning for isolated health workers.

Similar continuing education is the responsibility of the doctor at the peripheral health center in his relationship with his own sub-unit staff. There should again be a regular system of visiting and two-way flow of communication so that the educational impact filters out through all auxiliary workers to the general public.

Educational Methods Improving the quantity and quality of education requires more than merely increasing the number of instructors. Substantial improvement can be achieved by improving the instructional methods. In many cases students can learn as well without, as with an instructor. With the use of modern techniques it is possible to teach more students with less manpower. The key is improved methods.

It has been said that the first thing a teacher should know about teaching is to know when not to teach. Teaching in this sense applies primarily to the mere transfer of information. The statement recognizes that learning should be an active process, and the emphasis should be on learning rather than on teaching. This approach has not yet gained favor in many sections of the world where didactic teaching is the accepted practice, even at the higher levels of education. Emphasis on learning should begin at an early age, and is even more important in professional education.

If the objectives of education are primarily to provide information which the student is expected to recall at the time of examination, then the traditional methods of education may be satisfactory. If the objectives include teaching the student to define and solve problems, then there must be opportunities for greater involvement and active participation by the student.

The present shortage of teachers throughout the world need not be an impediment to such changes. Resistance to change is a greater problem than the shortage of teachers. At present the most common methods of instruction are lectures, demonstrations, and reading. "Inspiration"

is provided by the pressure of examinations. Even if the quantity of teachers were substantially increased, in many countries there would be little change from these teaching methods. In the United States, with many teachers, most still see their role as that of providing information rather than providing an environment which will stimulate learning.

The widespread availability of books has removed the original reason for many lectures. However, in many of the developing countries there is not only a shortage of teachers but also a shortage of books. Books are obviously more easily and cheaply provided than teachers.

The expository lecture will probably continue to play an important role in education in many countries for some time to come. However, much can be done to improve the quality of lectures, so as to provide some opportunity for active participation on the part of the student. If the object of the lecture is to transmit information, the size of the class is not critical provided that the speaker can be heard. Educational television often uses the lecture method to reach large audiences and, incidentally, preserves some of the defects of that method. It is possible that in the future television can be used for two-way communication. Present advantages of television include its ability to enlarge the audience of a lecture far beyond the immediate confines of time and space. Unfortunately, countries which cannot afford teachers cannot afford television.

The discussion method has many variations. If used correctly, it is an improvement over the lecture since there are greater opportunities for active participation on the part of the student. The transfer of information tends to be somewhat less than in a lecture but learning, in

the sense of exploration, may be much greater. The danger is that the discussion method may degenerate into a lecturette. It requires experience and preparation on the part of the teacher to be successful. With this method, the size of the class is critical. This is one deterrent to a more frequent use of this method in some countries. However, even where the classes are small there is not enough use of the discussion method. Some of the reasons for this are cultural. In a society where instructors are authoritarian and their views are never questioned or challenged, the climate is not favorable for active discussion.

The discussion method is not the most economical or rapid means of transferring information, but it permits the student to participate in the analysis and interpretation of data. The learner may develop a new synthesis of ideas if the environment is one which encourages creativity. The great value of this approach is that learning is more likely to be continued beyond the confines of the learning institution. One cannot so easily confine the spirit of inquiry, and this is important, for one main function of a school should be to enable a person to learn without a school.

Demonstrations, either in the laboratory or in the classroom, play an important role in teaching. They add a great deal of clarity to many learning situations, especially if the demonstrations are such that they can be seen clearly by all the students concerned. Many people learn best by seeing and education should exploit the use of all senses to providing learning experiences. Demonstrations, however, are a poor substitute for actual practice on the part of the student if the situation is one which requires the development of motor skills. The problem

with practice is often a lack of equipment and facilities. A shortage of teachers may be equally critical because practice makes perfect, only if it is the right kind of practice, and this requires supervision. It may actually be easier to solve these problems of shortages than to struggle against a lack of initiative or a strong prejudice against practical experience. Where there is a sharp dichotomy between theoretical learning and practical experience, then it is often difficult to interest teachers in making more use of practical experience. In countries where education is identified with the use of the brain as opposed to the use of the hands, introducing more practical experience into the curriculum may be considered beneath the dignity of the educators. As a result students go through training and learn facts but have little or no practical experience.

In recent years, there has been a rapidly developing interest in the use of programmed instruction. This method of instruction aims to present material in easy steps, one at a time. The program requires active participation on the part of the student, one of the requirements of good learning. There is immediate feedback to the student since the program checks his response and allows him to reinforce his learning, or make the necessary correction. Programming allows the student to set his own pace in learning. The supporters of programmed learning feel that the student learns faster and better than under traditional methods. Programmed instruction has been produced for use at various levels. For example, programmed courses range from those for the use of family planning workers in India to those for medical students in parasitology. Programmed instruction is being improved and has met a number of the

criticisms levelled at it earlier. For example, it was said that programmed instruction would be appropriate for teaching facts but not for teaching principles and concepts. This depends upon the program. Most of the programmed courses have better defined objectives than most traditional teaching. Even the best programs do not completely eliminate the need for teachers. Programmed instruction can provide a very effective means of increasing both the quality and quantity of the educational output.

The use of the community to provide learning experience in the health field has not been adequately explored. Without books and without laboratory equipment, much knowledge may be gained in the open book of every community. In both rural and urban environments there is the potential for faster and better learning outside of the school and it is unfortunate to see students confined to the classroom and the textbook while ignoring the dynamic and interesting lessons in the world around them. In some medical schools in the United States the students are urging the faculty to provide them with more community involvement. In this respect the students are ahead of the faculty. The teaching community, like the teaching hospital, should be considered indispensable for certain areas of learning and the experiences provided in the community should be well planned in order to permit the students to obtain maximum benefits.

Among the factors which influence the selection of a teaching community are its rural-urban status, location, size, topography, socio-economic groups, range of health problems, and the cooperation of the people. Where the teaching institution serves as the medical center of a large area, as in the case of regionalization, the whole area served by

the medical center may be considered the teaching community and will probably include both rural and urban segments, a wide range of health problems, and all socio-economic classes. Under these circumstances different segments of the community may be used for different teaching purposes.

On the other hand, when the institution has a smaller teaching community, then it may want to elect a rural one if the students will subsequently practice primarily in a rural area. It should be close enough to the teaching center so as to avoid spending a great portion of the learning time in travel. If it is far from the center, a period of residence would be preferable. The size of the community should be such as to avoid having to study the same household to the point of boredom and to give every student an opportunity to learn. In a teaching hospital it is considered desirable to have a minimum number of beds per student. In a teaching community it would likewise be desirable to have a minimum number of households per student but this determination would depend upon the specific learning experiences to be provided. If a student is learning to estimate the death rate by a sample survey, a larger number is required than if he is trying to estimate the birth rate. The student-doctor who is gaining experience in management of a health center in a country where the doctor patient ratio is 1:30,000 should have a practice area that is considerably larger than the student-doctor who is studying the relationship of environmental sanitation to health.

The topography of a teaching community should be representative of the area as a whole. Learning should not be confined to a single

socio-economic group. Although a strictly service program can confine itself to the lowest economic group, the educational program should be representative of the community. The range of health problems should reflect the range to be met in later practice. The cooperation of the community and its political leaders may be more difficult to obtain than the cooperation of patients in a hospital, but this is in itself an important learning experience.

The teaching community can be used for observation, for collection of data, as a frame of reference for problem solving, for learning management, for development of new programs--personal and environmental, for research and demonstration, and for developing attitudes of service. In return the community should tangibly benefit from the association.

The transmission of attitudes in medical and nursing education is vital. Motivation for service humanity rather than financial gain, concern for the rural population and the poor, and dedication to the concept of continuing education are all attitudes that may be, but usually are not, transmitted in the process of education.

The great technological explosion in the advanced countries in recent years, has extended to education. Tape recorders substitute for language teachers, computers and television extend the effectiveness of the teacher. All these devices tend to widen the gap between the have and have not nations. Unfortunately, the widening gap applies to more than education. The comparison is discouraging, especially in countries of Asia and South America which are faced with a rapidly growing population.

All that can be done is to use the best methods available within the resources of the country to maximize the quantity and quality of the

educational effort. The "have not" countries may claim that many students who were brought up under an educational system geared primarily to accumulation of information have still been outstanding scholars. These are the outstanding students who survive any system. The tragedy of that system, however, is that so many others have failed to measure up to their potential because the system did not encourage creativity.

Student Evaluation

In educational institutions where the examination is the chief stimulus to learning, there is a tendency to "cram" with the consequences that much is forgotten shortly afterwards. Education has been defined as "what is remembered after one has forgotten everything he has learned in school." When the examination becomes more important than the learning itself, this can hardly be called education.

However, examinations can be very important as a means of helping the student and teacher to determine the effectiveness of learning. Evaluation begins long before examinations with a clear statement of objectives, including criteria for determining when these objectives have been achieved. It should include the appropriate use of measuring devices before making judgment of the achievement of students. It is relatively easy to measure the amount of information and understanding gained. Evaluation is often confined to this level. Even at this level the evaluation techniques may be questioned. For example, it has been shown repeatedly that the essay type of examination does not provide consistent and reproducible results even when graded by the same examiners. However, its use continues, often on the grounds

that it is measuring much more than factual information. Whatever it is supposed to measure, its reliability and validity are far less than that of the objective examination. The latter have been criticized on the grounds that they measure merely recall or, worse yet, recognition. Although this may be true of some objective tests, many have become much more sophisticated and have more recently been programmed to measure achievement of the higher level cognitive objectives. The fact that these tests are more reliable is justification for their use. This is not to say that essay examinations are valueless.

The oral examination continues to be very popular. Like the essay type of examination, it is supposed to measure more than information recall, but in practice it hardly measures anything, especially when the number of candidates for examination is large. It suffers from many of the same defects as the essay type of examination and the evaluation may be even more subjective. Recent experiments with structured oral examinations offer promise of improved results.

Evaluation techniques become very important if an effort is being made to ensure that the right persons are being selected for the right jobs. At present, a high premium is being placed on information, but the ability to accumulate knowledge may not be the prime requisite for the job. If one can be precise about the requirements and if a reliable measuring device is available, selection of appropriate people for each category can be improved.

Some positions in the health field require not only knowledge but also motor skills. The midwife must be expert at delivering the baby. The sanitary inspector should know how to construct a latrine. A technician

should be able to prepare a good slide. A surgeon should be skillful with his hands. Here one measures performance and not merely knowledge. A written examination on how to construct a latrine is a poor substitute for actually constructing one.

Measuring achievement of objectives in the affective area is much more difficult than either knowledge or skills. Part of the difficulty lies in the fact that until recently there was no precise taxonomy of objectives in this area. It was known that education should change not only how we think and act but also how we feel, and objectives in this area were written into programs in terms that were vague and with meanings that varied from person to person. The Taxonomy of Educational Objectives in the Affective Domain, by Krathwohl, Bloom and Masia, provides a clearly defined set of objectives and thereby, permits a more reliable evaluation of achievement in this area. It classifies these objectives on the basis of increasing levels of internalization. The categories are receiving, responding, valuing, organizing, and characterization by value complex. In the field of medicine the idea of community service in the rural areas often does not reach the receiving level, and although some students may be aware of these problems they have not developed a willingness to respond, not to mention a commitment. If education is unable to elicit the appropriate "feeling response" on the part of the students, then to that extent it has failed. Knowledge alone is not enough. Family planning programs in India and Pakistan would accomplish more, even without additional manpower, if there were greater commitment on the part of the workers. One of the greatest problems of education is how to produce this change and to evaluate whether

or not it has actually occurred.

Licensure often involves some kind of evaluation. Completion of a course of study at an institution may carry with it eligibility for licensure or completion of the course may only be a prerequisite. Licensure may help to maintain the quality and quantity of the manpower pool and offer the public some protection. There is usually a definite gap between the evaluation of a license board and the evaluation that is given by an educational institution. In general, the licensure examination seeks to maintain a certain minimum level and is much more restrictive in its scope. It is possible that students from the best institutions may not necessarily be prepared to show the highest performance on licensure examinations. In fact, some of the teaching institutions concentrate on enabling their students to pass the licensure examinations whereas some of the best institutions consider it beneath their dignity. Right of licensure is often rigidly guarded by the states. They limit to some extent the number of personnel. Restrictions may vary according to whether there is a deficit or a surplus of manpower.

Continuing Education

In a restricted but common use education applies to what is learned during a specific period of time in a given institution. In its broader meaning, education would include anything within or outside the walls of the teaching institution which contributes to man's development. Education is a continuous process not limited to school. This concept places continuing education in its proper perspective. Continuing

education programs should not be confined to the professional health workers but extended to health workers at all levels.

The important factors which determine the content of continuing education are the needs of the community, the development of new knowledge, and the needs of the workers themselves. The needs of the community are constantly changing. For example, in the western countries acute communicable diseases are decreasing and chronic diseases are becoming more important. In India where malaria eradication is phasing into surveillance, large numbers of malaria workers are no longer necessary. In some cases these workers have been transferred to the family planning program. They had to acquire new knowledge in order to fit them for their new work. The changes in community needs are not always so striking. The usual situation is a gradual decline, as in tuberculosis in the United States.

Knowledge in the health field is growing at an exponential rate. It is difficult to keep abreast of new developments. Students who graduated from medical school ten years ago learned nothing about the intra-uterine contraceptive devices. Now we expect even midwives not only to be familiar with these devices but also to be able to promote their use intelligently. Thus, there is a gap between the development and the application of knowledge. Unless there is a means of bringing new information to people in the field, it will take a generation before new knowledge can be applied.

The needs of the workers themselves will largely determine the response to a program of continuing education. People are likely to be interested only in those things which are meaningful to them. If the workers have a recognized need for education, then the program of

continuing education is much easier to implement.

There are an increasing number of resources available for continuing education. Among the older established methods are group meetings of members of a particular professional category, such as meetings of the medical society or the nursing association. Larger group meetings which involve workers of different disciplines have proved to be equally useful in presenting multidisciplinary advances in the health field. Some groups, like the American Academy of General Practice, require their members to continue their education in order to continue membership in the Academy. In addition to association meetings, special lectures, films and other audiovisual devices bring new information. Libraries provide a valuable source of information, especially if the books are up-to-date and if recent journals are available in the areas required. Quite recently the Medical Literature Analysis and Retrieval System (MEDLARS) of the U.S. National Library of Medicine has helped to make a great flood of information more available to the reader. Programmed texts are another source of education which can be used by individuals to continue their education at their own rate.

It is often necessary to provide incentives for the effort to keep abreast of recent developments in one's field. Continuing education may serve as one of the bases for promotion in a system. Refresher courses could be provided or financed by organizations for the benefit of their members. When rewards and promotions are given entirely on the basis of seniority, then the incentive for improvement may be lacking. The Soviet system has a well-developed system of rewards for continuous education.

Opportunities for advancement may be provided either by promotion to a higher level within the same category or from one category to another. Having open-ended careers and allowing an individual to move up the career ladder may be a valuable incentive to continuing one's education. This upward mobility may be criticized as being uneconomical but economy need not be the only criterion. Some social systems tend to encourage upward mobility, while others do not. Generally speaking, those which permit more mobility tend to be more progressive.

In addition to the continuing education provided apart from the job, an important phase of continuing education may be provided on the job where the individual learns while working. The value of on-the-job training as an educational device depends largely upon the amount of supervision which is given. Learning done on the job is usually pertinent and meaningful. Consideration is now being given by some administrators to providing time for workers to obtain additional training while on the job and to consider this in possibilities for promotion.

Evaluation of the Educational System and Educational Research

Both the quantity and quality of the educational program need to be reviewed periodically. One might ask what are the specific objectives and targets of the system? Countries should establish targets for the number of health workers needed at various levels. How can these quantitative objectives be reached? What are the major barriers? The next step is to propose solutions to these problems. Solutions may be plausible on paper but unworkable in practice. Therefore, a number of small experiments should be tried to find the optimal solutions. When

solutions are found, they should be applied on a larger scale. Educational objectives vary. In one country there may be a relative surplus of one particular professional category. Another country may have a deficit of the same professional category. A common problem is maldistribution. There might be an excess of health manpower in the urban areas but a shortage in the rural areas. The problem for the educational system is devising a program which will encourage graduates to work in rural areas. Another problem is having too few nurses to balance the number of doctors or too few paramedical personnel to balance the professional staff. When resources are scarce does one build another medical college or three schools for medical auxiliaries? How does one operate the educational system to attract students into areas of greatest need? Usually decisions on areas of greatest need are a matter of national policy and are not made by the educational system itself. In some cases the government may decide that a certain percentage of secondary graduates will be admitted into one category, such as health; another percentage will be allocated to education and another percentage to government service. In such a situation, one hopes that the decision to allocate students to these areas is done on the basis of careful study rather than on a purely arbitrary basis. When the number of personnel is excessive in one category, the educational system may play a part in finding an optimal solution by raising the requirements for admission into that particular category. Research into the quality of education is a responsibility of the educational system. One of the first questions should be: Are the

educational objectives clearly defined? A clear definition of educational objectives would include not only the content to be taught but also the end results expected. Another question is the appropriateness of the learning experiences provided. A third area might deal with the sequence and integration of the learning experiences. Finally, one might ask whether the evaluation techniques are appropriate to measure the achievement of the stated objectives.

The examination of students has such an important bearing on the way students learn that this should be a matter of high priority in attempting to affect change in the educational system. Changing the learning experiences does not seem to have as great an affect upon the educational system as changing the form of examinations. Unless the objectives are clearly defined, the evaluation cannot be satisfactory.

There is need for basic research in education. This is going on in the developed countries. Because of limited resources and the large gap between what is known and what is applied, it is appropriate for developing countries to take advantage of the findings of basic research from other countries and to place greater emphasis upon applied research. Much work has been done in newer techniques in learning. Are these techniques appropriate in developing countries? What modifications are necessary? These questions should be the basis for applied research in developing nations.

In countries where resources are limited, it might appear to be uneconomical to spend funds for research. Even under these circumstances funds allotted for research need not be wasted. Research may very well lead to a large savings by increasing both the quality and quantity of

the manpower output. The question should not be whether funds are to be allocated, but rather, how much. The initial work need not require extensive funds. As long as there are students and teachers, there are opportunities for educational research. It may not be possible for all institutions to engage in research, but there should be at least one school with the freedom to experiment and explore non-traditional approaches. One such institution can have a great impact on the entire country.

Chapter V

IMPROVING MANPOWER UTILIZATION

Because of the long lag period in manpower production, any immediate improvement in health services requires more effective and efficient use of existing health manpower. Long range manpower planning also depends on improving utilization as much as on the numerical increases usually given most attention. Study of the conditions under which personnel can accomplish most is therefore a legitimate concern in manpower research and this leads directly to a primary focus on health services rather than looking only at health personnel. This chapter will cover first, a consideration of the general factors which improve the productivity of health manpower, secondly, an analysis of the potential for improving personnel distribution, and finally, an analysis of some of the motivational factors which lead personnel to work harder and better.

General Productivity of Health Manpower

Four basic approaches are possible in improving manpower productivity

(1) To provide more services per worker in the present system of health care.

(2) To provide a more appropriate distribution of services with better allocation of resources to the highest priority activities.

(3) To provide for a better quality of services.

(4) To use the continuing flow of technological development. This approach has in fact been responsible for much of the dramatically improved productivity of health services in recent years.

Quantitative Increases in Productivity

The simplest method of quantifying productivity is in terms of counting arbitrary service units based on the type of care provided. For instance, ambulatory medical care is usually measured by recording the number of patient visits to physicians. National and local differences in this index provide clear evidence of the tremendous variations between systems and suggest the magnitude of potential gains in productivity. Presumably, similar or greater variations would be found in data covering the whole range of health care services, including such items as hospital bed-days, home visits made by public health nurses, and sanitary inspections made by sanitarians. According to the U.S. National Health Survey of July 1963 - June 1964, Americans averaged 4.5 physician visits per year. After subtracting telephone calls, which are not a typical part of practice in most countries, and visits to public clinics, there were 3.6 visits per person in homes and physicians' offices. During the same period there were 188,000 physicians and doctors of osteopathy in private practice for a population of approximately 188 million civilians, or one private practice physician per 1,000 population. This means that the average physician provided 3,600 visits per year or, on the basis of 220 working days, about 16 patients per day. This figure does not take into account the time spent by many private practice physicians in hospitals.

In Soviet Russia, planners assume an average of 5 patients per hour and 5 hours in the working day or 25 patients per day. In Russia the standard work year is calculated at 282 days. Thus the average target for physicians is 5,900 visits. In point of fact, there are some 7,050

visits annually to each physician in the Soviet Union. This additional number is taken care of by the physicians working "double allocations," in other words, working longer than the standard five hour day.

The larger number of visits handled by physicians in the Soviet Union in comparison to the United States may well be explained by the fact that hospital practice is handled by a separate group of physicians who do not provide outpatient services or home visits.

In Taiwan, our health manpower survey showed that the average physician sees approximately 10,000 patients per year or over 40 per day. As a result the doctors are very busy and hospitalization is low. In Peru, the private sector is less productive with the full-time average equivalent private physician seeing about 16 patients per day. And in Turkey full-time private practitioners saw less than eight patients per day. In the public sector of Taiwan, the full-time equivalent physician at the health center sees 50 patients per day (though this may be somewhat of an overestimate since our figures are based on visits to the health center without specification of the person seen who may have been a nurse). In Peru, the average full-time equivalent government physician providing ambulatory care sees about 18 patients per day. Conversely, in some developing countries it is not unusual for the records to show that health center doctors are seeing several hundred patients per day.

The gross disparities in numbers of patients seen show how differently doctors work. Large numbers of patients cannot, however, be directly correlated with productivity since quality undoubtedly declines as numbers reach a performance threshold which has yet to be defined. Still, for the financially pressed health services of developing countries,

It is an obvious waste to have physicians who see only a few patients a day. Similar data are needed for all health activities to begin to develop valid productivity norms.

The Provision of More Appropriate Health Services

Improved allocation of health services requires a clear definition of priorities. This in turn depends on balancing economic and human resources against the various factors influencing demand. The process of manpower allocation is particularly subject to multiple pressures ranging from local political influences to the personal desires of individual health personnel.

In decisions concerning the appropriateness of health manpower allocation, a primary determinant is the question of how the various modalities of health services are to be balanced (hospitalization, outpatient care, preventive services, etc.). For many health problems the preferred modality of service is self-evident, or at least the choice is very limited. No planner need spend time estimating the costs of lowering mortality due to smallpox by the alternative methods of immunization programs or hospitalization. Where a proven preventive technique exists, there is no question but that it is superior to the curative approach.

Unfortunately, the choice is seldom that simple. Many health problems cannot yet be prevented nor is there an obviously better method of controlling them. Nevertheless, the use of economic and manpower models, when tempered by professional judgment, can help show which types of services deserve greatest priority.

One way to approach this problem is to construct tables giving the number of services of different types that can be produced at approximately the same cost. Table V-1, based on Peruvian standards and salary levels, provides such estimates for six types of services.

Table V-1. ESTIMATED SERVICES PRODUCED ANNUALLY BY SELECTED HEALTH RESOURCES; SERVICES PRODUCED FOR THE COST OF ONE LONG-STAY DISCHARGE

Health Resource	Services Per Year	Services for Same Cost As One Long-Stay Discharge
Long-stay hospital bed	1.5 discharges	1.0
Short-stay hospital bed	27 discharges	9.6
Doctor in clinic	8190 visits	486
Dentist in clinic	4550 visits	700
Sanitary Inspector	2250 inspections	1029
Immunizer	9100 immunizations	5830

The degree of substitutability among these services varies considerably depending on the problem under consideration. For much acute disease, when ambulatory care is provided there is reduced need for hospitalization. Although there is considerably less substitutability of ambulatory care for hospitalization in the case of diseases requiring surgery, this consideration is not eliminated since good clinic services will permit earlier discharge.

Even though the relationship between the demand for one type of service cannot yet be related quantitatively to the demand for another, guidelines can be developed to shape policy. In 1964 the ratio between public sector doctor visits and short-stay hospital discharges was 24:1 in Peru. Looking to the future, and based on the estimates given in Table V-1, the government could provide an average of two visits per year

to about 25 persons for the cost of treating one patient in a short-stay hospital.

When the present maldistribution of health services is taken into account, the differences in potential coverage make a policy favoring ambulatory care even more attractive. Small hospitals, particularly those of less than 50 beds, tend to be medically and economically inefficient, whereas an ambulatory facility with only two doctors and auxiliary staff can operate effectively. Using again the estimates given in Table V-1, Peru could staff approximately four health centers of two doctors each for the same cost required to maintain 50 hospital beds (excluding the cost of outpatient care). In a country where most communities are small, transportation is poor, and a substantial proportion of those requiring hospital care could have been treated satisfactorily on an ambulatory basis if such services had been readily accessible, the advantage of giving higher priority to ambulatory care becomes obvious. Even in technically advanced countries the reduction in disability and discomfort provided by concentrating on early ambulatory care is in itself justification for deliberately changing the policy that has spontaneously evolved of emphasizing inpatient services.

Similar comparisons can be made between short- and long-stay hospital care. If the cost of a bed-year is the unit of measurement, a long-stay bed costs about 53 percent (based on Table V-1) of a short-stay bed. However, in terms of patients brought in contact with the health system, a long-stay bed is almost ten times as expensive. Thus, to the extent that selected patients with chronic conditions can be given more intensive treatment in short-stay facilities, thereby resulting in

earlier discharge, the number of persons benefiting from a given investment will be increased.

In some countries the scarcity of certain types of manpower may present an even greater problem than financing. Table V-2 presents a different view of the standards used in Table V-1, this time showing the manpower and capital requirements resulting from equal expenditures for hospital and ambulatory medical care.

Table V-2. RELATIVE MANPOWER AND CAPITAL REQUIREMENTS FOR EQUAL EXPENDITURES ON AMBULATORY MEDICAL AND HOSPITAL CARE^a

Expenditure Category	Relative Manpower Required for Hospital Care Compared to That Required for an Equal Expenditure On Ambulatory Medical Care	
	Short-Stay Hospital	Long-Stay Hospital
Doctors	41%	39%
Nurses	610%	454%
Technicians	23%	32%
Auxilliarities	134%	113%
All	121%	100%
	Relative Capital Investment Required for Hospital Care Compared to That Required for an Equal Expenditure On Ambulatory Medical Care	
Capital	850%	1200%

^aBased on Peruvian standards and excluding costs of goods and services.

It is apparent that according to present Peruvian standards, ambulatory services require proportionately more doctors and technicians but less nurses than do inpatient services. Assume that a country finds itself at a given time with a 50:1 ratio of doctor visits to discharges and that this is considered an appropriate balance between the two modalities of care. What would be the preferred policy regarding the allocation of new resources? All things being equal, the existing ratio should be maintained. If, however, nursing personnel are in particularly short supply, or foreign exchange (to buy hospital equipment) and investment capital are scarce, a policy of shifting the ratio to 55:1 might be temporarily expedient. Later, as the shortage is corrected, greater priority could again be given to building inpatient facilities until the desired ratio was restored.

Summarizing, the discussion has centered on factors that may favor the use of one service modality over another where a degree of substitutability between them exists. The need to achieve a better distribution of services, to allow more frequent patient contact with the health system, and to treat diseases before they incapacitate all argue for emphasizing ambulatory care. In some countries it may also be necessary to give priority to those service modalities most saving of scarce resources.

Improving the Quality of Health Services

The adequacy of health care depends more on its quality than its quantity. The superior physician can often make a brilliant diagnosis in a brief time, where a more average practitioner might invest much of his own time and many patient visits. Quality of care depends largely on

the level of preparation and the personal characteristics of health personnel.

Although quality of care is generally recognized to be important, it is hard to measure. Many methods have been tried with varying relevance under special conditions. In the free market system, patient satisfaction is an important measure of quality despite its lack of scientific respectability. Patient satisfaction may govern choices within the private sector as well as choices between private and public sector medical care. Long waits in public clinics may persuade patients to use private doctors' offices although medically, the care in public clinics might be as good or better than that obtained from a private practitioner. The major flaw in the use of patient satisfaction as a measure of quality is its superficial basis. No single patient has enough experience to adequately judge and compare the long-term success rates of different practitioners or different systems of medical care.

Most studies of quality of medical care have been based on the ephemeral guide of "expert judgment."^a For example, the failure to use key tests to establish certain diagnoses have been regarded as an indication of poor quality care. Failure to take an adequate history and perform a physical examination according to set standards have also been considered as signs of poor quality by expert observers. The weakness of expert judgment as a practical measure is the difficulty of standardization of observers and then of applying the method on a widespread continuing basis. It ordinarily required direct observation. Review of

^aPeterson, O. L. "An Analytical Study of North Carolina General Practice, 1953-54". J. of Med. Educ., Vol. 31, No. 12, Part 2 (December 1956).

case records may be productive in hospitals where they are kept in adequate detail, but this method has little applicability to physicians' offices in most countries.

Official norms requiring the consistent practice of specified routines have been used to maintain quality but such a method tends to "ankylose" the medical care system. Extensive use of norms may be inimical to experimentation and improvement. The Russian system of medical care makes much use of norms for controlling the practice of medicine but such requirements could never be applied to free and unrestricted private practice. Norms are more appropriately used for such nonqualitative items as the number or cost of particular activities.

In scientific experimentation the real test is to compare end results. Such measures may also be useful when the systems of medical care are as different as modern scientific medicine and faith-healing. End results may be measured by mortality (or more usefully, case fatality) or by morbidity. Although end results are technically the most valid measure of quality of care, the applicability of this yardstick in a developing nation is usually not feasible. Morbidity data are virtually non-existent and mortality data are of dubious reliability.

We turn next to the continuing problem of quality control. The most important and long-lasting control mechanism follows directly from the training of health personnel. Of primary importance are the firm establishment of appropriate values and ethical principles. The consideration and kindness that characterizes high quality practice must be deeply internalized. If medical schools can convey a strong sense of social responsibility to their students, the quality of care will be improved spontaneously.

Professional associations, licensing boards and specialty boards may legislate and police standards to maintain professional ethics. In practice these mechanisms more often measure quality of training or the ability to pass examinations than the quality of care actually provided. Seldom do qualifying or licensing bodies conduct continuing measurements of the quality of care provided by the physicians that they certify.

A hospital staff may be organized to provide day to day review of the work of colleagues. Through record review committees, tissue review committees, and utilization committees, it is possible for peer judgment to monitor the quality of inpatient care. The measurement of quality of outpatient care is far more difficult because of the simple fact of dispersion. One benefit of group practice is the tendency for continuing working relationships to keep professional standards at a high level.

Where health insurance or "third party" payments exist, there may be opportunity for some quality control. Usually this is attempted through various devices for checking routine records. If there is one agency covering payments for services of a large number of practitioners, it may be possible to conduct periodic quality surveys and studies.

The method of payment can itself contribute to control of quality. In a "fee-for-service" system, if the fees are realistic physicians will be encouraged to give patients complete examinations, order needed laboratory tests and encourage followup visits. The fee-for-service system may lead, however, to more expensive and less efficient medical care when fees are set too low and physicians inordinately increase the units of care in order to increase their income.

In all suggestions for increasing the quantity of care without lowering quality, an element of surveillance or continuing evaluation is implied. A point may be reached where the cost of this surveillance may be more than it is worth.

Productivity and Development

Physician productivity in the United States has increased phenomenally in the last several decades, largely due to technological development.^a The clearest examples are the modern healing miracles achieved by drugs and surgical techniques which were not available a few years ago. The tremendous investment that went into supportive care for a pneumonia patient while waiting for a crisis, or the careful nursing required by a severe case of typhoid now lingers only as a bad memory. The long list of chronic conditions requiring continuing care which are now routinely relieved by surgical intervention includes infectious conditions, congenital defects of many organs, neoplasms and a wide range of metabolic conditions. Although the present availability of techniques greatly increases the sophistication needed to handle diagnostic and therapeutic equipment and agents, the net effect of technological advance is certainly to increase the productivity of health personnel.

General development also increases markedly the output of health personnel. Physicians in the United States have been able to increase their productivity by limiting the number of house calls. This has been due partly to the availability of telephones for consultation and also because better transportation makes it much easier for patients to come

^aFein, Rashi. The Doctor Shortage, an Economic Diagnosis, Washington: The Brookings Institution, May 1967.

to where services can be most readily provided by doctors. Convenience for the doctor is, of course, not the important consideration, but rather that he can provide better care in his office or the hospital where facilities, equipment, and specialized supporting personnel are available.

One of the greatest obstacles to increasing the productivity of available health manpower in developing countries is the technological lag. Simple problems of communication and transportation seriously impede the effective implementation of regionalization. Modern record systems and data analysis are increasingly dependent on sophisticated equipment and technicians. Among the greatest handicaps in setting up an efficient health service are administrative barriers to the provision of appropriate logistic support.

Technological improvements are particularly necessary for efficient hospital services. Low hospital productivity is particularly wasteful of resources. The reasons for the low productivity of hospitals in developing countries are varied and include the following:

- (1) Advanced disease processes requiring extended inpatient care because of delay in seeking attention.
- (2) Poor home conditions prohibiting early hospital discharge.
- (3) High incidence of preventable infections and nutritional diseases.
- (4) Inappropriate or insufficient equipment and supplies.
- (5) Poor administration and/or work organization leading to long waiting periods for even routine procedures.

(6) Limited demand for care, particularly in small communities where health personnel are in competition with traditional healers.

(7) Insufficient paramedical and auxiliary personnel.

Of these, all but the first three can be corrected within a reasonable period of time if they are given the priority they deserve. The Planning Office in Peru hopes to increase the turnover in short-stay government hospitals from 16 to 27 patients per bed-year by rather straightforward administrative changes. Even though the desired target is well below the levels found in many countries (30-35 per bed-year), it would, if achieved, increase the effective bed supply by almost 70 percent.

Distribution of Health Personnel

In most countries, regardless of the level of development, the problems of distribution aggravate and accentuate all other manpower difficulties. In strictly private enterprise systems of health services the basic distribution problems are of socio-economic origin. Many societies are attempting to resolve these difficulties through the introduction either of socialization of services or various programs for insurance and subsidized care. Especially in developing countries, there seems to be widespread recognition of the government's responsibility for equalizing services for various social groups and in general, political pressures ensure such a trend. There are two distribution problems, however, which are far from being resolved and which are particularly relevant in any analysis of health manpower. These are the problems of

rural-urban distribution and of the geographic distribution of personnel to the less attractive parts of any country.

Rural-Urban Distribution Patterns

Most countries show a marked imbalance of health personnel concentrated in urban areas. Organized health services reaching rural people are usually limited to preventive activities, or where transportation makes it possible, the rural population seeks medical care in cities. Some ratios indicating the extent of the rural-urban imbalance in Peru and Turkey are presented in Table V-3. The imbalance of nurses is often even greater than that of doctors. Even in Russia where the distribution of manpower is controlled by the government, there is a continuing problem in getting doctors to work in rural areas. A compulsory system leads to all sorts of special maneuvers to arrange urban appointments.

Table V-3. POPULATION PER DOCTOR AND PER NURSE: BY SIZE OF COMMUNITY: PERU, NIGERIA AND TURKEY, 1964

Professional and Community Size	Population Per Professional		
	Peru	Nigeria	Turkey
<u>Doctors</u>			
Big cities	700	2,500	500
Towns	1,900	{ 57,400	2,700
Rural	17,600		16,000
<u>Nurses</u>			
Big cities	1,200	n.a.	2,700
Towns	3,500	n.a.	13,700
Rural	37,900	n.a.	118,900

There are in fact many good reasons why no doctor or other health worker would want to work in rural areas. Special studies of the attitudes of doctors toward rural work in India and Turkey have produced the

following findings, ranked according to the importance given to various reasons for not undertaking rural service: India--lack of living facilities in rural areas, poor financial compensation, social isolation, inadequacies in supplies, buildings and equipment of the primary health centers, service conditions and facilities inadequate for maintaining professional competence, fear of political interference, poor orientation in medical schools and family objections; Turkey--inadequate medicine and supplies, unqualified assistant personnel, inadequate transportation and postal services, lack of library and research facilities, supervision by non-professional persons, lack of professional meetings and stimulating contacts, lack of educational facilities for doctors' children and lack of proper housing.

Administrative Problems. From the administrative point of view also there are major problems associated with the isolation of remote rural areas. These relate basically to three functions: supervision, training, and patient and supply logistics. In each instance the problems are mostly concerned with communications and transport. There has been a natural tendency to turn to modern technology to solve some of these difficulties, especially because of the increasing possibility of using radios and air transport. Such methods were first pioneered by the Flying Doctors Service in the Australian bush. More simplified adaptations are now being tried in places such as Northern Nigeria. It has yet to be demonstrated whether such technological advances can be brought within the financial capacity of most developing countries.

The first problem requiring continuing contact with rural outposts is obviously the need for supervision. It has been stressed repeatedly

throughout this monograph that auxiliary health workers are, in general, only as good as the supervision provided them. Rural health programs in many areas have consistently shown that a basic reason for the supervisory relationship is to obviate psychological isolation of the peripheral health worker. He must be made to feel that he is part of a system. When he gets into trouble, he can call on others for help and receive professional support and counsel. In surveys of physicians' attitudes toward rural service in India it was found that a group of factors related to the lack of opportunities for professional consultation and advancement were second only in importance to inadequate drugs, supplies and equipment.^a

It is also important that the doctor realize that when he makes mistakes somebody will know about it promptly. It has been repeatedly observed that the health worker who is isolated for too long a time progressively lets his standards of work slip as he takes short-cuts that lead to sloppy technique. This is as true of an isolated doctor as it is of an auxiliary. There are few people who have sufficient strength and discipline to maintain high levels of professional performance without continuing contact and working relationships with colleagues. Although working with capable subordinates in a remote post may be some compensation, there seems to be no substitute for regular contact with peers and supervisors.

A second problem, which grows out of the first, is maintaining an adequate in-service training program in situations without communications

^aTaylor, C. E., Alter, J., et al. Unpublished data from Rural Health Research Projects, Narangwal, Punjab, India.

for transport. The more remote the outpost the more essential it is to bring each health worker back to a regional medical center for periodic refresher courses. If supervisors cannot make regular weekly visits to provide educational contact, then it is essential that peripheral workers be rotated back for short refresher courses focusing on problems met in their regular work.

The third problem associated with isolation is the logistical one of referring patients, getting supplies and maintaining the usual outside support required to operate a health service. In addition, if periodic visits cannot be made, then extra effort should go into establishing regular radio contact or a system of records which can be sent back and forth to provide information on improvements in diagnosis and treatment. In general, the more remote and isolated the area, the more technically qualified and practically innovative the individual in charge should be. Similarly, in the most remote places, great care must go into ensuring the regular arrival of supplies and drugs and the stock of drugs in the isolated post must be particularly complete. In short, it takes more planning to run a remote outpost.

Alternative Personnel Patterns

Many years of trial and error effort in trying to find ways of meeting the needs of isolated rural areas have led to some general impressions which will be summarized to indicate alternative patterns of manpower distribution.

Isolated Rural Health Worker. The traditional system developing spontaneously in most places has been for individuals to be located in rural outposts to which they happened to be attracted by chance more than

planning. The motivational patterns leading to such choices ranged from the deep dedication of the pioneer missionary, to sheer love of adventure and perhaps in certain instances to their running away from civilization. Then there are the whole group who merely go back to the place where they happened to grow up.

Most developing countries feel correctly that they cannot wait for such occasional and chance factors to act. Instead they organize systems whereby a regular flow of personnel for remote situations can be provided. The usual pattern has been to prepare an independent rural health worker at the maximum level of training which was possible without weaning him away from the rural situation.

It has been shown that the most important factor in getting such trained individuals to work in rural situations is if they themselves had a rural background. Our research on the rural orientation of doctors in India shows clearly that an old and strong preconception is erroneous. It has been said for years that once rural youth go to a city for training and are exposed to the advantages of city life they will be the last to return to serve in rural areas. This notion arose naturally from talking with individuals in the city who had come from a rural background because they had already made the decision that they would not go back. In careful studies of the attitudes of young Indian doctors with urban and rural backgrounds, a clear pattern emerged indicating that the attitudes of those with a rural background were better in the following characteristics: they were much more ready to serve in rural or government positions, especially in public health; they were less influenced by financial remuneration, prestige, leisure opportunities and nearness to home in

choosing a career; they were more inclined to suggest practical measures for preventing diseases, to applying community health measures, to learn how to manage a primary health center and auxiliary workers; they were less concerned about lack of social activities, educational facilities for children and health hazards; and they were more favorably inclined towards village people.^a Not only were their attitudes better but even more importantly it was found that those with a rural background could be trained more readily for rural work, they profited more from rural orientation and training, and they seemed more ready to adapt to doing effective work once they did return to rural areas. The clear indication is that even if the training program has to be in an urban center, a concerted effort should be made to recruit rural people for this training and during their training days should be found to maintain their contact with a rural situation.

The point has already been stressed that every technical device possible should be found to maintain communication with professional peers and supervisors. Any medical missionary working in an isolated outpost will testify to the tremendous stimulus he gets from professional friends in his home country who write regularly about medical problems and advances, and who send him copies of journals and scientific publications. Providing the isolated professional with a constant flow of publications dealing with new approaches to handling the problems of his area will have maximum value in situations where other types of consultation are not available.

^aIbid.

Rural Health Worker Team. A more systematic approach to distributing health services to rural areas has gradually developed in the past 30 years. Regionalized health services are planned to accommodate local needs in an efficient and flexible way. The basic unit for providing both curative and preventive health services to much of the world's population is the rural health center, planned geographically to serve population units from about 7,000 (Turkey) to 80,000 (India).

For most countries the pattern calls for a fully-qualified doctor to serve as leader of a balanced health team. Unfortunately, these doctors are seldom adequately prepared to handle the community responsibility thrust upon them. Whole new patterns of medical education need to be developed emphasizing the preventive and community functions of the health center doctor.

The Gondar (Ethiopia) pattern differs significantly from that found in most countries in that neither the community nurse nor the health officer are fully qualified professionals in the usual sense. Both are given shortened training programs and relatively more emphasis on preventive and community services than on curative medicine.

Although it is the responsibility of the health center doctor to provide supervisory and educational support for members of his staff, the regional framework within which he works has to be responsible for providing him with similar professional support. To cover the large population unit assigned to him, he has to develop a system of visiting and consulting through the entire area. This is done best through a system of subcenters with each unit staffed by isolated auxiliaries with whom he maintains regular contact through visits and a variety of consultation mechanisms.

In running such a health center system, experience in many countries indicates that possibly an "all or none" phenomenon may be operating. Some 12 components of the health center concept have been identified. In order to produce a workable system, all of these should be introduced together. The greatest weakness of the health center movement in the past has been that people have tried to implement it by changing existing systems gradually, introducing only three or four of these components at any one time. When such changes did not work, they would shift to another three or four components. It now seems probable that unless the whole system can be established the chances are that a successful program will not develop. The omission of even two or three key components may negate the total effect. The essential components may be briefly listed as follows:^a

- (1) Regionalized framework.
- (2) Responsibility for defined geographic and population units.
- (3) Comprehensive care.
- (4) Viewing the community as the "patient."
- (5) Accepting the family as the basic unit of care.
- ✓(6) Stimulating community participation in activities.
- (7) Spreading method of payment so tax funds can really be concentrated on preventive activities.
- (8) Having effective controls within a regional organization.
- (9) An effective team organization.
- (10) Health center doctor's role being concentrated as leader of health team.

^aTakulia, H. S., Taylor, C. E., et al. The Health Center Doctor in India. (Monograph to be published by The Johns Hopkins Press, 1967).

- (11) Appropriate allocation of health functions to other members of health team.
- (12) Providing new educational orientation to all personnel.

Geographical Distribution Patterns

Although the major distribution problem in developing countries is the rural-urban problem, there is an overlapping, more general geographic distribution imbalance which must be studied. Certain areas of a country are clearly more desirable to live in and work in than other areas. Health workers tend to congregate not only in the major metropolitan centers but also where living conditions are most desirable. All countries have certain regions where it is extremely difficult to get qualified and educated personnel to go. The lack of cultural opportunities and educational facilities for children loom especially large in their influence.

The factors involved in geographic distribution may be approached through the same general set of solutions suggested for rural-urban distribution. Perhaps the most important measure that can be taken is to structure salary scales so that special allowances are given for service in the remote and least desirable sections of the country. Such financial inducements can be justified because professional personnel often find it more expensive to live in such remote areas. A surprising range of costs build up for the individual who tries to maintain a better way of life in a remote area, even though local costs for staples may be lower. Almost anything that is brought in will be more expensive because of additional transportation costs.

A final comment needs to be added on the extent to which a health worker should identify with the rural people around him. Though it is important for the health worker to develop a close emotional identification and casual living relationships with local people, he must be careful not to carry this identification process to the point of bringing his own living patterns down to the level of those whom he is trying to help. An experience in a north Indian village with a community development worker clearly illustrates how such noble-minded, self-sacrificing efforts are interpreted by local people. This particular worker had adopted completely the local pattern of living including all the health hazards for his family. The villagers' comment was "If he can't do any better, what hope is there for us?"

Motivation for Service

Motivation is a complex inner force which is generally recognized but seldom analyzed. Like gravity it is evidenced mainly by what it does. It is the end result of many vectors of psychological and intellectual forces pushing and pulling in various directions. The final resultant of these interacting drives is arbitrarily labeled motivation as the summation which directly determines behavior. Understanding the component elements of motivation and beginning to develop techniques of measurement are important for two reasons. First, since the real objective is to understand behavior, analysis of the background forces that underlie motivation should help in predicting behavior. Second, in the analysis of motivational variables, it may be that certain components will be found that are particularly susceptible to change by appropriate

modifications of discrete environmental conditions while general motivation might remain resistant to change if attached directly.

In a manpower study, the primary interest in productivity focuses on the behavior of health personnel. If productivity is to be improved, personnel must be induced to work harder and more efficiently. They must also be encouraged to do the right things. A particularly important part of motivational research in manpower planning is in connection with factors which influence recruitment to particular types of activity.

For manpower purposes then, motivational studies resolve themselves largely into a concern with the incentives and disincentives which lead people to choose certain kinds of work and determine how effectively they will perform that work. The advantage of looking specifically at incentives and disincentives is that these are elements which can often be modified or changed. Since incentives and disincentives are presumably reciprocal, they could be scaled from some neutral point to fit any particular emotional variable, if we had methods of measurement. Since a positive approach is usually desirable, we will, in general, talk about incentives, but it must be realized that frequently the administrative action needed will be to remove a motivational block or disincentive.

Categories of Incentives

Monetary. In a modern society the motivational force of money is usually dominant. It has the great advantage for administrators that it can be readily manipulated but is, of course, expensive. When individuals are looking for a job, certainly financial remuneration is often the first question asked. In increasing productivity, likewise the most obvious

and easily recognized direct incentive is to relate recognized merit on the job to financial rewards. Part of the attractiveness of private systems of medical care is that financial rewards tend to be direct. The relationship to work accomplished is apparent to the health personnel in a fee-for-service system. In the transition to a salaried or panel system of health care one of the important changes usually is that other motivational considerations assume more importance relative to direct monetary rewards. A less direct financial incentive is the prospect of regular salary increments in a secure paid position. Our Turkey study showed that financial insecurity was a major concern of the medical profession. Government salary scales were set on the expectation that physicians would supplement their official salary by private practice or by seeking other jobs. As a result, doctors tended to work in two or three places. Some of the extra jobs were treated casually with extremely low productivity in any one position. The total productivity of each practitioner could have been vastly increased by the physician's putting in a full day's work on one job and working effectively during that time. The greatest obstacle to such a reorganization of medical care services is that the whole structure of public financial remuneration needs to be changed. In many developing countries similar patterns have developed with practitioners giving half-hearted attention to a government job for several hours a day and then spending long hours in private practice under relatively unsatisfactory conditions. The ethical problems arising from the tendency to divert patients to private offices are evident.

Intellectual Satisfaction For most professionals, a tremendously important motivational consideration is the intellectual satisfaction of their work. Individuals who have received an advanced education as part of their professional preparation tend to respond to a stimulating and challenging environment. Tasks which involve decision-making usually provide the greatest professional stimulation. The most productive individuals are those who seek situations which are challenging and difficult. A good professional also prefers a job that requires constant study and inservice education to keep up-to-date.

Auxiliary workers tend to be less demanding of intellectual satisfaction. Their responsibilities are more routine. To a considerable degree, routine tasks can be performed best by individuals who carry them out automatically and attempt to balance a minimum number of variables in making decisions. Osler referred to certain practitioners as practicing "penny in the slot" medicine. The implication is that on learning a certain symptom, like a penny dropping into a machine, the automatic response of a symptomatic treatment would follow. Although this is bad practice for a physician, this sort of reflexive response usually should be encouraged in ancillary personnel.

Dedication and Service

An important but difficult to quantitate motivational factor is an altruistic sense of helping people in need. This has always been a special characteristic of health personnel though oftentimes less apparent than claimed. This feeling has nothing to do with professional level

since it can as strongly motivate the lowest level auxiliary worker as the most highly trained specialist. It often has deep roots in a religious and humanitarian orientation. Such motivational drives have always been particularly evident among international health workers and the long tradition of medical missionary service is replete with instances in which profound personal sacrifice was endured for the good of others. Although other motivational drives can often be camouflaged or faked, a true spirit of service becomes evident in the silent language of behavior. Simple rural people are oftentimes particularly sensitive to the realities of such feelings since they are usually more responsive to such motives than their urban counterparts who become both skeptical and highly skilled in camouflaging such drives.

Effectiveness and productivity are usually maximum where there is a high level of such humanitarian motivation. These drives become established early in most individuals and there is little that can be done in a formal organizational way to promote them except to look for and welcome such persons in recruitment. Within the whole framework of professional ethics there are, of course, numerous negative checks against those who flagrantly violate such motivational standards, but so far little has been done to promote ethical attitudes in a positive way.

Many newly independent countries are striving to generate in their people a sense of national identity and willingness to undertake specific service to meet national needs.

Rotation and Advancement

Health services are usually structured in an elaborate hierarchy which provides numerous opportunities for advancement or movement to

other positions. Clear patterns of hierarchical progression with a general understanding of the basis on which advancement is made can be a tremendous force in promoting appropriate motivation. Conversely, if advancement is determined only by seniority and a "clean record", motivation and productivity will be minimal.

Working Conditions and Security

In many developing countries employment conditions and long term security have more meaning than immediate financial reward. This is particularly true where alternative opportunities for employment for educated people are limited. In newly independent countries the future may seem so uncertain because of political instability that individuals are eager to find employment opportunities which will provide a modest but comfortable living standards. The greatest value is placed on ensuring the continuation of such employment.

As part of general working conditions there is particular value attached to the place and situation of employment. Severe cultural restraints may limit what certain groups can do, where they can work, and the individuals with whom they can appropriately associate. A primary reason for difficulties in incorporating women in the labor force of some countries is that there are many social restrictions on what is considered appropriate and decent. Similar restrictions apply to caste groups in countries such as India and to racial and tribal groups in many countries. A common finding is that certain occupations become the primary responsibility of particular social groups. Individuals from another group then are not made to feel welcome.

Another broad category of incentives are those simple material benefits which are usually thought of first, especially in more developed countries. This general group includes considerations such as "nearness to home," pleasant working surroundings, and the convenience of transportation, social benefits and amusements.

Facilities for Good Professional Work

One of the most important working conditions for many health professionals is the adequacy of the equipment and supplies provided for their daily tasks. In our Rural Health Research Project in India efforts were made to define the most important obstacles keeping doctors from enlisting for rural service. With remarkable consistency in all parts of India the doctors rated as the most important block the gross inadequacies of equipment, drugs and medical supplies provided for their routine work.

Part of the problem was that they had not been trained to work with simple equipment or to be innovative in adaptation. More important was the simple fact that the supplies and equipment provided for rural doctors were little more than sufficient for low-level auxiliary activity. By any standards the doctors were justified in their complaints that lack of such material support seriously handicapped their work. Efficiency and productivity can scarcely be promoted without providing the appropriate equipment and drugs, especially since they cost far less than personnel. The fear of small losses can be better controlled by mechanisms other than holding back supplies.

Prestige:

The great variations in prestige attached to particular responsibilities in health services determines to a considerable extent the attractiveness of employment opportunities. In some situations prestige becomes a primary determinant of the attractiveness of a particular employment category.

In general, prestige is influenced most by popular recognition of specific activities, and this in turn is primarily affected by the public's understanding of what is being done to fulfill their felt needs. It is felt by candidates considering health careers mainly through the attitudes and opinions of their family members. The most immediate felt need is the relief of pain and suffering. The highest prestige is then attached to those who most dramatically bring such relief. This explains the greater prestige of curative services. It is much harder for the lay public to recognize the value of preventive services since the alleviation of illness is usually remote from the relevant health function. Similarly, within the curative specialties, highest prestige is accorded to those physicians able to provide dramatic cures through the application of easily understood skills, as is the case with surgeons.

A related consideration influencing prestige is the degree to which a life and death responsibility is assumed for individual patients. A similar life and death responsibility for large numbers of people in a community through public health activities is accorded lower prestige because the control over life is less apparent than with the delicate manipulations of the heart surgeon or neurosurgeon.

Increasing sophistication of the general public does alter the prestige hierarchy. This is most evident with the increasing public interest in research contributions.

There are, of course, many other motivational considerations which have been referred to at various points in this monograph. For instance, the chapter on education develops the importance of educational preparation and the values instilled by the role models of respected teachers.

Chapter VI

THE EMIGRATION OF HEALTH PROFESSIONALS

The emigration of health professionals from developing countries erodes the ability of these countries to provide their citizens with adequate health care. In general, it is the most highly trained who are able to re-locate, and it is this group which is most costly to replace.

Funds diverted from present consumption for investment in the form of education or training represents investment in human capital. Human capital comes in many kinds, but requires maintenance as do capital goods. While obvious that the entrepreneur is more vital to a developing economy than the street sweeper, it is often forgotten that the entrepreneur, the technician, and the skilled worker need adequate health care in the same way a machine needs periodic maintenance, spare parts, and a mechanic to effect repairs from time to time. When health care is not available, whole enterprises may be slowed down, or be reduced in efficiency. Illustrations are given by development workers of the near ruin of projects in developing countries due to the death of a key man from a preventable or treatable illness. In labor-plentiful, but skill-short areas, trained human resources are not easily replaced.

The loss of human capital through the migration of engineers, scientists and professionals to developed countries seriously retards the rate of development in many sectors of developing economies. In the health sector this "brain drain" may result in a shortage of available health workers, which in turn may affect industry through the death of an engineer, or manager from a preventable or a treatable illness. The absence of an engineer may decrease the production of fertilizer, and

affect the farmer who through lack of health care is even less productive because of debilitation due to chronic illnesses such as schistosomiasis or malaria.

Basic to what follows is the notion that adequate health care is one of the necessary elements in the sustenance of a viable and productive economy. To the extent that this is true, losses of large numbers of health professionals through emigration adversely affects the growth of any economy. The effects and magnitude of the "brain drain" of health professionals will be examined and palliatives suggested in the discussion which follows.

Magnitude of Losses

Migration of unskilled persons, or surplus workers from labor-plentiful to labor-short regions results in an economic gain to both sending and receiving countries. While there is usually a period of social disequilibrium for migrant workers in their new environment, increased productivity is usually the outcome. On the other hand, emigration of highly trained, expensive professionals in labor-short occupations results in benefits to receiving countries and the migrating individuals, but seldom to the sending countries. Sending countries must either replace such persons at considerable cost, find less expensive substitutes, or more typically, make do with the supply remaining.

Migration of health professionals for training is common, and their return usually results in positive gains at little financial cost to the sending country. If large numbers remain abroad upon completion

of training, however, the loss of human capital is substantial. Some "educational fallout" is to be expected in any exchange program. The question that must be answered by each country, however, is whether the magnitude of permanent migration and loss of health professionals is so large as to affect the service benefits received from returnees. This is not an easy question to answer.

Firm figures on the emigration of health professionals from most countries are scarce. Very few countries keep careful counts of departures and re-entries of their nationals by occupation. Often, however, careful count is kept of foreign nationals entering most countries. As a result, some notion of emigration from "sending" countries can be estimated through studying immigration to "receiving" countries.

Government agencies collect statistical data to meet their own needs, and summary statistics available do not often serve the purposes of those having different objectives. In addition to the problem of kinds of information available, the matter of definition plays an important role. When studying brain drain we are interested in knowing rates of permanent migration of individuals, but we face the problem of deciding at what point we shall consider a health professional as lost to his country and thus a part of the brain drain. Regardless of preferences, investigators are limited by the character of raw data collected on any emigrant or immigrant population by official agencies.

Our present concern is with permanent rather than temporary change of country of residence of health professionals; as a result, visitors and students with short-stay visas are not regarded as actual losses. While study abroad inevitably puts individuals at greater "risk" of becoming losses, many thousands of individuals study abroad, and return home each

For our purposes, we will regard those individuals holding immigrant visas as losses, as well as those who have changed citizenship. An unknown, but small proportion of those holding immigration visas return home eventually.

The United States is a country to which large numbers of persons are admitted each year. In the fiscal year ending June 30, 1965, a total of 2,372,664 foreign nationals were admitted to the U.S. Most (2,075,967) of those persons were non-immigrants and were admitted for temporary residence. The immigrant group consisted of 296,297 persons admitted for permanent residence. In view of the belief that large numbers of professionals migrate to the U.S. each year, U.S. Immigration and Naturalization Service data will be examined in some detail to see what light can be thrown on the matter.

^a Annual Report: 1965 U.S. Immigration and Naturalization Service, Government Printing Office, Washington, D.C. 1965.

TABLE VI-1
Admissions to the U.S. as Immigrants, and Naturalized Citizens of
Professional, Technical and Kindred Workers
By Region of Former Allegiance
Year Ended June 30, 1965

<u>Region</u>	<u>Professional and Technical Workers</u>					
	<u>Immigrants</u>	<u>%</u>	<u>Naturalizations</u>	<u>%</u>	<u>Total</u>	<u>%</u>
Europe	12,941	44.9	5,452	55.3	18,393	47.6
North & Central America	9,840	34.2	1,916	19.5	11,756	30.4
South America	3,172	11.0	442	4.5	3,614	9.4
East and West Asia	2,113	7.3	1,654	16.8	3,767	9.7
Africa	505	1.8	132	1.3	637	1.6
Oceania	219	0.8	80	0.8	299	0.8
U.S. Poss., Stateless & Not Reported	<u>0</u>	<u>0.0</u>	<u>178</u>	<u>1.8</u>	<u>178</u>	<u>0.5</u>
Total Professional and Technical Workers	28,790	100.0	9,854	100.0	38,644	100.0
All Occupation Totals	296,697		104,299		400,996	
Percentage Professional, Technical and Kindred Workers	9.7		9.4		9.6	

Source: U.S. Immigration and Naturalization Data, 1965.

Table VI-1 shows the total number of persons admitted as immigrants, the total number naturalized, and the number of professional, technical and kindred workers by region of former allegiance for the fiscal year ending June 30, 1965 (FY 1965).

During the same period 296,697 persons were admitted as immigrants, an additional 104,299 became U.S. citizens. Thus a total of 400,996 persons of foreign origin changed their status with respect to the U.S. during FY 1965. Of this total, 38,644 or 9.6% were professional, technical, or kindred workers, and it is this group which includes scientists, engineers and health professionals.

Information on specific occupations of health professionals admitted to the U.S. in 1965-65 as immigrants is given in Table 2 below.

TABLE VI- 2

Health Professionals Admitted to the U.S.
As Immigrants Year Ending
June 30, 1965

<u>Occupation</u>	<u>Number</u>	<u>Percent</u>
Nurses	4,247	62.0
Physicians and surgeons	2,012	29.4
Pharmacists	276	4.0
Dentists	182	2.7
Veterinarians	69	1.0
Dietitians and nutritionists	66	0.9
Total Health Professionals	6,852	100.0
Total Professional, Technical & Kindred Workers	28,790	
Percentage Health Professionals	23.8%	

The numerically largest group of health professionals admitted as immigrants were nurses (4,247) followed by physicians (2,012). Nurses and physicians thus formed in excess of 91% of the health immigrant group.

In the absence of firm figures it is possible to estimate the total FY 1965 nurse gain to the U.S. by assuming that the proportion of health professionals (23.8%) in the professional, technical, and kindred groups amongst immigrants will be the same in the group who became naturalized citizens. We would therefore expect to find an additional 2,345 health professionals amongst those naturalizing in 1965, giving a grand total of 9,197 health professionals. The probable total gain to the U.S. then becomes 5,700 (4,247 plus 1,453), and the probable physician gain to the U.S. becomes 2,071. These figures are under-estimates since professors, and instructors in the medical sciences are not included. Physician professors and instructors form an unknown proportion. It is known, however, that 7.8% of all foreign-born, foreign-medical graduates in the U.S. in 1965 held appointments in medical schools at the rank of assistant professor or above.^a

Taking the extrapolated gain to the U.S. of 9,000 health professionals in FY 1965, we begin to form a picture of the recent migratory input for one year to one developed country.

The argument has been put forward that the brain drain to the U.S. is more apparent than real. The line of reasoning is that since total migration to the U.S. is large, one could expect to find a component of health professionals among immigrants representing a "fair share" of

^aFerguson, D. C. Unpublished Data, 1966.

those persons needed to attend to the health needs of the immigrants. While the "fair share" notion sounds reasonable enough, it is a hypothesis which can be checked out empirically.

Table 3 details the total immigration from selected countries prior to admission to the U.S. in FY 1965. Countries selected were those with which the Johns Hopkins University, Division of International Health, has been involved in its research programs. Canada has been included to illustrate the "way-station" phenomenon. For many reasons, some foreign nationals first migrate to Canada, become Canadian citizens, and then migrate to the U.S. as Canadian emigrants. There is no easy way of determining their length of stay in Canada. For these persons Canada serves as a "way-station". The United Kingdom, Germany and several other countries also serve this function for those who ultimately migrate to the U.S.

With the help of the data in Table 3 we are able to examine the "fair share" argument. A "fair share" of professionals can be thought of as approximately one M.D., plus 3 nurses per 1000 immigrants of a nationality group. Table 3 suggests that using this criterion, doctors are over-represented in the immigrant group, and, in several instances, the number of nurses exceeds the 3/1000 ratio. In terms of equity, we can see that these countries are an illustration of some of the complexities in migration statistics to be discussed below.

TABLE VI- 3
 Health Professionals Admitted As Immigrants
 to the United States by Country
 and by Occupation
 Year Ending June 30, 1965.

<u>OCCUPATION</u>	<u>COUNTRY OF LAST RESIDENCE</u>					
	<u>Turkey</u>	<u>India</u>	<u>Iran</u>	<u>Nigeria</u>	<u>Peru</u>	<u>Canada</u>
Dentists	1	1	1	0	0	17
Dietitians and Nutritionists	0	0	0	0	1	32
Professional Nurses	2	2	9	7	17	1419*
Optometrists	0	0	0	0	0	5
Pharmacists	0	1	1	0	4	21
Medical and Dental Technicians	1	1	3	0	3	190
Physicians	15	11	23	3	25	380**
Professors, instructors medical sciences	0	2	0	0	0	5
Veterinarians	0	0	0	0	0	9
TOTAL HEALTH PROFESSIONALS	21	19	37	10	50	2073
TOTAL IMMIGRANTS YEAR ENDING, JUNE 30, 1965	905	582	804	156	1953	38,327
Percentage Health Professionals	2.3	3.3	4.6	6.4	2.6	5.4
Percentage All Professional, Technical Workers	15.2	9.5	21.0	23.0	26.2	44.8
Physicians/1000 Immigrants	16.5	18.9	28.6	19.2	12.8	9.9
Nurses/1000 Immigrants	2.2	3.4	11.2	44.8	8.7	37.1

*Includes 13 nurses born in East and West Asia (1 Iranian)

** Includes 37 physicians born in East and West Asia (8 Turkey, 7 Iran, 2 India)

SOURCE: Unpublished U.S. Immigration and Naturalization Service Raw Data, 1966.

Examination of Table 3 shows that in the six countries selected, health professionals formed from 2.0% to 6.4% of total immigrants from these countries in 1965. For all countries, they constituted 2.3% (6852/296,697) of the total group (Table 1). As a proportion of professional workers, the range of the health professionals was from 9.5% to 16.2% for five countries, but was 23.8% of total professional and technical workers from all countries (Table 2). In the case of immigrants from Canada it was possible to determine the country of birth of the immigrants, and it was found that 218 of the 1,419 nurses, and more strikingly 193 of the 380 physician immigrants from Canada were foreign born. Thirteen of the nurses were born in East or West Asia, as were 37 of the physicians. Canada loses considerable numbers of her native born health professionals to the U.S., but obviously is being used as a "way station" for others. It is clear from the data presented that the 5 developing countries are exporting doctors beyond what could conceivably be considered a fair share.

Comparable data, could not be obtained for persons naturalizing in FY 1965. Thus the numbers, ratios, and other figures given in Table 3 are firm figures, but must be regarded as underestimates of the true one-year losses of these countries to the U.S. in 1965.

It may seem from the data presented in Table 3 that a comparatively large issue is being made over a numerically small group. It should be remembered, however, that this data does not contain the number who have naturalized in 1965, and that it represents only one year's losses.

In dealing with the question of total physician migration to the

U.S., the author^a has recently embarked on a series of studies. This work has utilized raw data from the Physicians Records Section of the American Medical Association. Over the years the A.M.A. has built up a data collecting system on all physicians in the U.S.A. Data is maintained not only on American medical graduates, but also on all foreign medical graduates whether interns, residents, trainees, in hospitals, government service, or private practice within the United States. Data on each physician is punched onto I.B.M. cards, and a full-time staff perpetually updates, and periodically resurveys all physicians on the roster. Since such information is of considerable commercial value (pharmaceutical sales, mailing listings, etc.) the A.M.A. has been highly motivated to keep all information current.

Studies of the foreign-born, foreign medical graduate group (FMG's) have revealed that over the years a sizeable pool of FMG's have settled in the U.S. These studies suggest that what is presently called the brain drain has been going on for many years, but also that a noticeable acceleration of the trend occurred subsequent to World War II.

Table 4 presents data on the number of foreign born FMG's in the U.S. in the calendar year 1965 by region of medical school graduation and training status. The trainee category consists of interns, residents, and fellows and graduate trainees. Non-trainees are those FMG's not in training. They have completed training and are working in some medical capacity.

^aFerguson, D.C. Unpublished manuscript, 1966

TABLE VI-4 FOREIGN MEDICAL GRADUATES IN THE U.S. DECEMBER, 1965
BY COUNTRY OF GRADUATION, GEOGRAPHICAL REGION, AND TRAINING STATUS

	<u>Trainees</u>		<u>Non-Trainees</u>		<u>Total</u>	
	No.	%	No.	%	No.	%
Europe	2,066	16.6	13,881	56.1	15,947	42.9
Far East	5,803	46.5	2,656	10.7	8,459	22.7
Latin America	2,220	17.8	3,208	13.0	5,428	14.6
(Caribbean)*	(682)	(5.5)	(1,532)	(6.2)	(2,214)	(6.0)
(South America)*	(1,131)	(9.1)	(986)	(4.0)	(2,117)	(5.7)
(Mexico)*	(316)	(2.5)	(615)	(2.5)	(931)	(2.5)
(Central America)*	(91)	(.7)	(75)	(.3)	(166)	(.4)
North America (Canada)	828	6.6	3,393	13.7	4,221	11.3
Near and Middle East	1,274	10.2	1,185	4.8	2,459	6.6
Africa	204	1.6	291	1.2	495	1.3
Oceania	<u>79</u>	<u>.7</u>	<u>118</u>	<u>.5</u>	<u>197</u>	<u>.6</u>
TOTAL	12,774	100.0	24,732	100.0	37,206	100.0

*Percentages are expressed in terms of denominator for total Latin American F.M.G.'s.

SOURCE: Ferguson 1966. Unpublished paper.

The total FMG population in the U.S. in 1965 was 37,206 and was thus 12.7% of the entire U.S. physician supply of 293,874 M.D.s. House officers and trainee FMG's constituted 29.4% (12,474) of the total number in service (42,474).

When citizenship data is examined (Table 5), we see that 42.9% of the FMG's have become U.S. citizens over time. Using the criterion of citizenship change as an index of physician loss we see that 5.4% (15,980) of all U.S. physicians are foreign-born as well as foreign-educated. As is evident from Table 5, the proportion of those who have naturalized while in training is something less than 1 in 20. This 5% figure could be regarded as the actuarial risk of loss while in training. For those who stay after training the "risk of non-return" is obviously much higher.

TABLE VI-5 FMG'S PRESENT CITIZENSHIP DECEMBER, 1965

	<u>Trainees</u>		<u>Others</u>		<u>Total</u>	
	No.	%	No.	%	No.	%
U.S. Naturalized	579	4.6	15,401	62.3	15,980	42.9
Far East	5,167	41.4	962	3.9	6,129	16.5
No Data	1,533	12.3	4,552	18.4	6,085	16.4
Latin America	1,964	15.8	1,136	4.6	3,100	8.3
(South America)*	(997)	(8.0)	(432)	(1.7)	(1,429)	(3.8)
(Carribean)*	(616)	(4.9)	(524)	(2.1)	(1,140)	(3.1)
(Mexico)*	(218)	(1.8)	(141)	(.6)	(359)	(.9)
(Central America)*	(133)	(1.1)	(39)	(.2)	(172)	(.5)
Europe	1,204	9.7	1,160	4.7	2,364	6.4
Near and Middle East	1,197	9.6	463	1.9	1,660	4.5
North America (Canada)	590	4.7	813	3.3	1,403	3.8
Africa	163	1.3	111	.4	274	.7
Oceania	65	.5	55	.2	120	.3
U.S. Derivative	12	.1	79	.3	91	.2
TOTAL	12,474	100.0	24,732	100.0	37,206	100.0

*Percentages are expressed in terms of denominator for total Latin American F.M.G.'s.

SOURCE: Ferguson 1966. Unpublished paper.

Table 5 reveals the numerically largest group of FMG's in the U.S. are European-educated. The small proportion in Table 6 who are citizens of European countries, by contrast, reflects the greater tendency of Europeans to remain permanently in the U.S. Examination of the "fine grain" of the data for individual countries by year of graduation suggests the tendency to remain and naturalize is increasing for FMG's from the Near and Middle East (East Asia) as well as for those from the Far East (West Asia). The brain drain seems to be increasing from these areas.

While data presented are by no means exhaustive or inclusive, the immigration figures are firm, and more accurate than educated guesses so often found in the brain drain literature. Even critical observers must admit that such data is highly suggestive of a phenomenon whose effects cannot be in the best interests of the developing countries of the world. An attempt will be made to examine consequences, and alternatives to the loss of health professionals through emigration in the discussion below.

Effects of Losses

Health professionals are in short supply in most countries. Long, expensive training, costly facilities and preparation extended over several years are needed in their production. Fully trained physicians, dentists, and nurses have knowledge and skills which are of value in most countries. In the world market, a number of developed countries offer incentives, and practice opportunities which have become increasingly attractive to those from less favored areas in recent years.

As documented in a previous section, emigration to countries such as the U.S. has been substantial. In countries with an over-

abundance of untreated illness and communicable and infectious disease, good sense tells us that the loss of significant numbers of health professionals can result only in further deterioration of the amount and quality of medical care available. Additionally, explosive population growth has not been paralleled by a corresponding increase in production of health professionals. The consequences of population growth alone in terms of increased need for medical service are awesome.

Loss of medical care, health services, and economic productivity are direct consequences of the scarcity, maldistribution, misutilization, and migration of health personnel, but some of the more subtle consequences of emigration are less obvious. In developing countries, health people are part of the small cadre of well-educated citizens, and, as such, are found frequently in positions of intellectual, cultural or political leadership. Even if they do not work in the health sector, they still constitute valuable human resources better equipped for leadership than most of their less educated countrymen. Loss of health professionals through migration thus diminishes potential leadership, as well as medical resources.

Science is a costly activity, but there are indigenous illnesses which a country cannot afford to neglect. Results of research to be had for the price of subscriptions to journals produced in developed countries may be useful to poorer countries, but many of their most urgent health problems are more prevalent in their own regions. Their own scientific corps is necessary, and with few scientific manpower resources, research on such matters is difficult.

Finally the matter of cost itself must be considered. Economists such as Grubel^a have maintained that if there is no effective demand for the services of a group of professionals in terms of willingness to pay for their services at market rates, then the loss of such persons does not substantially affect the economy. Such thinking is true only when considering groups whose activities directly result in production of goods with immediate market value. It is naive to use this argument with occupational groups who are part of the knowledge or health industry, since their work results in productive gains less proximate to the investment than is the case with manufacturing.

The economic loss involved when a health professional migrates is similar to that incurred in the loss of a manager. The cost of his training, the loss of his productivity, the cost of his replacement, and the dollar value of his services to the economy are all lost. In the case of the physician, a P.A.H.O. subcommittee^b uses \$20,000 as the conservative educational cost of graduating a physician. Elementary and secondary education accounts for perhaps one-third of this figure, but the remainder is directly associated with higher education. If we take four developing countries used earlier as an illustration, and examine physician losses through migration to the U.S. alone, we can then begin to get a notion of amounts of capital lost through migration over time by these countries.

^aGrubel, H.G., and Scott, A.D., "The International Flow of Human Capital," American Economic Review, LVI, no. 2, pp. 268-294.

^bReport P.A.H.O. Subcommittee on Migration, Migration of Health Personnel, Scientists and Engineers from Latin America, Pan American Health Organization, Washington, 1966.

TABLE VI-6

Foreign Medical Graduates in the U.S., December, 1965,
by Country and Visa Status

	<u>U.S. Naturalized</u>	<u>Immigrants</u>	<u>Exchange Visitor</u>	<u>Other</u>	<u>Total</u>
Turkey	133	153	122	119	527
Iran	103	84	529	210	926
India	80	56	1210	200	1546
Peru	<u>73</u>	<u>138</u>	<u>54</u>	<u>44</u>	<u>309</u>
	389	431	1915	573	3308

Source: Ferguson, 1967. Unpublished report.

Table 6 shows 3308 medical graduates of Turkish, Iranian, Indian, and Peruvian medical schools were resident in the U.S. in 1965. Of this total group 389 or 11.7%, were Naturalized U.S. citizens. An additional 431 or 13.0% were immigrants admitted for permanent residence in the U.S. Some 1915 (57.9%) physicians were exchange visitors, and must leave the U.S. for two years after completion of training. The other group consisted of those holding various categories of short-stay visas.

Of the total, 820 or 24.7% form a group unlikely to return. Using the P.A.H.O. estimate of \$20,000 per physician, we see the educational dollar loss conservatively approximates \$16.4 million dollars for these four countries alone. Additionally, an unknown number of physicians in Exchange Visitor and Other categories will re-migrate or return to the U.S. in the future. Attempting to assess the dollar value of medical services lost to their home countries over a professional lifetime would

take more extended discussion than is feasible in this chapter. Suffice it to say this figure would be much larger than the \$16.4 million in educational losses estimated above.

Assuming that losses are sizable, costs are great, and replacement is difficult, it would next seem appropriate to consider factors which stimulate or result in the emigration of health professionals.

Motives for Migration

Emigration is the resultant of a number of forces. While there are forces which "pull" or attract migrants to developed countries, often neglected, however, are forces which "push" or encourage emigration of health professionals, and other skilled persons. It must be remembered that scientists and other highly educated people are members of an international community sharing similar technical concerns which often transcend national boundaries. Technical skills in short supply find a ready market in other countries. With the acquisition of another language, and after a brief training experience to meet legal requirements, physicians, dentists, nurses, and other health people find it easy to re-locate in Europe, the United Kingdom, Canada or the U.S. If minimally competent, professionals whose skills are in short supply are seldom unemployed in these countries.

In considering motives favoring migration of health professionals, it is necessary to point out that many remaining abroad originally leave their countries with no intention of becoming emigrants or expatriates. Such persons should be thought of as unintentional emigrants.

Unintentional emigrants emerge over time from among those who seek, are encouraged, or are sent abroad for advanced study or training. The

probability of unintentional migration increases directly as a function of the number of years abroad. It is well to bear in mind that those who go abroad for unsponsored advanced study constitute a group from which

"emigrant fall-out" will occur regardless of their original plus.

There are far fewer losses among sponsored groups who have jobs to which they can return.

The dynamics of unintentional migration seems to follow a pattern.

When a trainee first goes abroad for study, there is a phase of touristic novelty in which the receiving country is seen as interesting but strange and confusing. Later "cultural shock" can be discerned and discomfort

in adjusting to new foods, customs, clothing, and ways of life is acutely felt. Nostalgia is high, and dysphoria and discouragement are often

present. As time goes by, the ways of the receiving country seem less strange, and the people and way of life more acceptable. Eventually, with the growth of friendships, with acculturation, and growing availability

of economic and professional opportunities, the resolve to return home often begins to weaken. As the ways of the new country become less alien,

the ways of the home country no longer seem as desirable as they once did. Values change, and with this change in values frequently goes a change

in goals. Trainees at this point often begin to internalize goals which are not possible at home. Possession of an automobile, and an income which permits expensive recreational pursuits not possible for many years in the home country create a personal revolution of rising expectations.

What was once luxury is then thought of as necessity. Such individuals have a high probability of deciding to remain "for another year" when their training period is up. After deferring return home for a number of

years, many experience "reverse culture shock" upon return to their home country.

Since many in training are young, unmarried, educated, and interested in the opposite sex, opportunities for marriage often present themselves. When the foreign student marries, it is often to someone with little real interest in returning to the trainee's country of origin. The birth of children frequently causes wives to be reluctant to have their husbands take posts where conditions of economic hardship are almost inevitable. Beginning positions in developing countries are not notable for financial, professional or material benefit. Thus, habituation, acculturation, marriage, and children are all forces which summate to increase the probability of trainees staying abroad for long periods, and becoming unintentional migrants. In short, emigration of health professionals is often a consequence of study and experience abroad, rather than a premeditated and intentional action.

Turning to consideration of "push" factors which encourage emigration, it is of interest to note that almost one-fifth of all immigrants admitted to the U.S. since 1945 have been refugees. For reasons of war, political instability, because of ethnic or religious persecution, many health professionals have left their countries of origin. The German Jews, Turkish Armenians, Chinese mainlanders, and other displaced or disadvantaged members of minority groups such as Moslem Indians or Indians of low caste have found a home in developed countries. Possession of useful skills often results in the migrant receiving a preferential immigration status.

Within many countries today social factors exist which make the minority group health professional feel unwelcome, and encourage migration from his country of birth. Though a family may have lived in a country for many generations, they may be regarded as foreigners by the majority. The developed countries are not free of ethnic, racial or religious prejudices by any means, but economic opportunity and professional freedom are not denied most minority group members.

Factors which create civil conflict, nurture minority group discrimination, and perpetuate social and economic disadvantage are not easily modified. Such symptoms are readily described but underlying causes are not readily ameliorated in developing countries. There is little likelihood of radically changing the conditions which result in emigration of minorities. Education and equal occupational opportunity are the only changes that will make some difference. Cultural changes take time. Passing laws does not change peoples feelings.

Another emigrant sub-group consists of the academicians, and scientists who wish to teach but see limited opportunity in their native land. Science in developing countries is not well funded, and facilities and equipment are hard to come by. Universities often have the worst characteristics of the German system in which academic freedom is for full professors and students, but is quite minimal for the junior and intermediate faculty. In such institutions, faculty are limited in what they may do. Research may be appropriated by senior professors with little acknowledgement, and for those having experience abroad, this sort of situation is often intolerable. Occasionally a more egalitarian, and

less restrictive system is found. Where abuses of older systems are eliminated it is often possible to recruit expatriate nationals.

Schools such as the Hacettepe medical and nursing faculties of Ankara University are having only minor difficulty in recruiting and retaining faculty. A large proportion of their faculty has returned from the U.S. and United Kingdom (U.K.) to take posts in Turkey.

To the extent that excellence exists within training programs in a country, the need for training abroad diminishes. Adequate stipends are necessary, for it is often the need for a training stipend that helps lure health professionals abroad for training initially. The "honor" accruing from serving in the best hospital in Athens neither feeds the resident's children, nor puts a roof over their head. These are realities he must contend with. There is a certain economic naivete about many training directors abroad who feel that the privilege of training in a highly regarded center is income enough. In the world market for physicians, competitive forces demand training stipends of a size sufficient that house officers can be self-supporting. Physicians tend to settle where they have received advanced training, and if abroad, tend to remain to practice where they are known, and can build a practice. Loss of many physicians can be forestalled simply by providing adequate training stipends in the home area.

Finally, if physicians or health professionals in national health systems are not given adequate salaries, or supplies necessary to do a decent job; if they are given few opportunities for advancement, or are not rotated out of undesirable locations periodically; if they cannot afford

for a few of their children the education they have had themselves, they will be easily attracted to more hospitable environments. If fewer professionals are treated better, rather than many being treated poorly, losses through emigration will be diminished. If the cost of producing health professionals is too high, and the time required is great, it behooves developing countries to either offer more incentives to retain existing professionals or as an alternative, to concentrate on producing less expensive, less highly trained substitutes.

Alternatives to Laissez-Faire

The "brain drain" can be influenced by actions taken either by "sending" countries or by "receiving" countries. Where actions are to be taken by "receiving" countries, a number of countries must be persuaded to enact legislation, to appropriate funds, and set up policing mechanisms. In the light of recent history, it can be assumed that nations, like individuals, will act most quickly where matters of self-interest are involved. To the extent this is true, good sense dictates that it would be both unwise and unnecessary for developing countries to wait for the U.S., the United Kingdom (U.K.) or Germany to "do something" about the brain drain.

In the case of the U.S., which is basically a country of immigrants, the children and grandchildren of immigrants will not easily be persuaded that the doors should be closed to others. The United States is the only world power today that has arisen on a polynational migrant base. Additionally, persuading legislators to act in the best interests of other countries is a difficult task. In international affairs, most

governments act on the assumption that it is more blessed to receive than to give where benefits are involved. There seem to be few historical exceptions to this general rule.

Prompt and effective intervention to stem the international migration of talent and skills can be taken most effectively by countries of origin of emigrants. A country must be sufficiently concerned about its losses to take action, for the solutions will depend on what a country is willing to do for itself. The position taken in what follows is predicated upon the belief that there are remedial measures open to developing countries, if they are truly concerned, to slow the emigration of health professionals. The role of developed countries thus becomes more appropriately one of cooperation, rather than initiation.

Concentrating our attention on countries of origin of emigrant health professionals, rather than on "receiving" countries, we find several types of remediation possible. Gollin^a divides the measures into three categories:

- 1) Preventive measures aimed at lessening factors which "push" or encourage migration.
- 2) Restorative measures which encourage or stimulate repatriation temporarily or permanently.
- 3) Restrictive measures which limit, monitor, and control out-migration, and which tie education abroad to national development.

^aGollin, A.E., in Proceedings, Conference on International Migration of Talent and Skills, U.S. Department of State, October, 1966., p. 8.

Gollin's position is that the primary locus for effective action is the country of origin of the migrant. A country of origin is like the source of a stream with branches which end in many countries. Most effective action can be taken at the source, since only the leadership of a country concerned with its "brain drain" can take the full range of remedial action which may be necessary. Action taken downstream may result only in diverting the total flow of migrants from one country to several others.

Preventive Measures

- (1) Manpower needs and shortages differ from country to country. Only through planning and monitoring can national manpower needs be anticipated. The planning function is central to effective manpower utilization. One of the mechanisms which can serve as a watchdog and recruiting device is a National Manpower Commission. Such commissions are ordinarily composed of influential high level persons who are charged with the responsibility of manpower review, and recommendation of legislation or policy to government. While the commission is a deliberative body, usually a supportive organization for gathering manpower information and statistics is often added to civil service or attached to a university. The Institute of Applied Manpower Research in New Delhi was founded to conduct research on manpower matters. The purpose of such an organization is to alert governments to potential problem areas, and to stimulate planning.
- (2) To monitor the outflow of persons in critical categories, a series of occupational rosters can be set up. Those leaving

the country at all border points can be entered on the usual departure rosters, and additionally on separate occupational rosters to be turned over to the official agency responsible for analysis of manpower information. To be of use, re-entries as well as departures must be recorded if the balance sheet is to be meaningful. All categories need not be monitored, but a few additional questions asked when border formalities are conducted with one's own nationals would quickly reveal significant trends.

- (3) In some countries migration for foreign study or work is encouraged. As mentioned earlier, encouragement of study abroad starts many people off on a journey which supposedly ends in a return trip home, but often does not. Strengthening of existing programs within a country, creation of new regional programs, and the provision of opportunity for additional training on a competitive basis will offer incentives for people with ability and ambition to improve their situation.

In Iran today an interesting variant of required military service is open to the high school graduate. Upon inducting an individual may elect to become a member of the "Education Army" and receive basic training, teacher training and instruction in community development. Upon successful completion of the training program he is promoted to the rank of sergeant, and in uniform is sent to an Iranian village for a year. The best of these rural teachers are awarded prizes and public recognition, and are

offered further teacher training and a job when their military service is completed. There is further selection for advanced training after two years, and promotion to supervisory roles. The best supervisors are given university education and promoted again. The program has been in operation for several years and has been quite successful in attracting and training village teachers and developing leadership.

The Iranian government has developed a similar program for health professionals called the Health Corps, but it is too early to assess the success of this program. The "Education Army" and "Health Corps" are novel conceptions which offer opportunity for service to self, country, and others with built-in opportunity for education, promotion, and upgrading. Technical assistance where needed is brought into the country, lessening the need for education abroad.

Several principles are clear in the Iranian example. The first is creation of opportunity within the country for employment service and training. Secondly, incentive for further training and promotion in the location in which the individual is expected to practice is part of the program. Thirdly, trainers are imported rather than trainees exported. Long-term costs of importing outsiders to train others for limited periods (1-2 years) are far less than the cost of losing large numbers of nationals as a result of training abroad.

- (4) While political or civil conflicts encourage migration, discriminatory treatment of doctors and nurses who are minority group members also encourages physicians to remain abroad. Most doctors who go abroad support themselves in their train-

ing, and if they are unable to obtain jobs or positions because of their religion or national origin in the country of their birth, they will remain abroad. Armenians and Greeks of Turkish birth, Moslems of Indian birth, German Jews and Arabic Israelis all are over-represented in the proportion of those remaining after training in the U.S. Each country must strive to find individual answers to the minority group questions. Sizable proportions of those remaining in the U.S., for instance, also seem to be from socially or economically disadvantaged backgrounds.

- (5) Job guarantees, or recruitment of people who are to be trained abroad before they leave will also diminish losses. Many foreign medical graduates in the U.S. reported having returned home to find positions and giving up in disgust in six months to a year and re-migrating to the U.S.

Preventive measures listed above are by no means exhaustive, but taking steps to voluntarily reduce emigration seems the most effective place to begin such efforts.

Restorative Measures

To encourage return of health professionals, the use of incentive to stimulate repatriation is a second line of defense. Efforts at stimulating interest in the homeland through publications, and newsletters may be a beginning, but opening an office in New York as the Israelis have done, with listings of job opening in Israel, and active efforts on the part of the staff to recruit expatriates for these positions demon-

strates that the Israelis are making a serious and sincere effort to encourage repatriation.

Iran in the past, has allowed duty-free entry of an automobile for returning Iranian physicians and engineers, and flies one of its jet airplanes to the U.S. to pick up students and return them to Iran for the summer. These all represent positive efforts and expressions of interest on the part of governments in their expatriates. The expatriate who has not settled fully into foreign ways of life cannot help but be tempted by his government's attempts to provide a better life in his home country.

An experiment being seriously discussed in some quarters is the provision of repatriation fellowships for doctors and their families with the opportunity to stay in a permanent post on completion of the fellowship period. The hope is that these physicians will re-assimilate and decide to remain in their native land.

With innovation, and some expenditure, it is possible to motivate some of the not-quite-lost to return home again. Few individuals enjoy being a "foreigner" or "alien", and if well treated will forgo income to eat their own food, speak their own language, worship in their own way, and follow their own customs. Amelioration of professional conditions, provision of income, supplements for scarce categories, and provision of incentive and promotion based on ability will encourage many to repatriate.

Restrictive Measures

All restrictive measures are largely coercive in nature, and when used without care may lead to resistance, circumvention, and rebelliousness.

An example of a restrictive measure was that proposed by an M.P. from Great Britain who proposed that medical emigrants be required to post bond, or repay the \$10,000 or more expended by the government on their medical education before they would be allowed to leave.

Similarly, many countries now require that physicians serve in rural areas, in the military service, or in government hospitals for two years before being allowed to practice privately, or to go abroad.

Another plan has been to issue passports on a year-to-year basis and to grant extensions only if the person is training in selected programs. There is something to be said for such a plan since it discourages large numbers of professionals from obtaining training in specialties irrelevant to the needs of the country. Few countries can support or utilize large numbers of cardiac surgeons, pediatric allergists, or plastic surgeons, but can utilize many internists, pediatricians, general surgeons, and public health physicians.

Required government service may postpone migration, but does not seem to diminish it appreciably. Restrictive policies such as preventing ECFMG examinations from being offered within a country, as has been the case with Egypt, may act to discourage emigrants, but largely those who cannot afford to take the examination abroad. Repressive measures being applied to particular occupational groups may backfire and make recruitment into those professions difficult. On the other hand, the imposition of a rather substantial exit tax on all Iranian nationals discourages international travel through making travel more expensive, and almost prohibitive for less affluent citizens. Exemptions for officially sponsored individuals

and groups are given but are governmentally controlled. Personal freedom of movement is inextricably tied to the view that a nation has of the responsibilities of its citizens as contrasted with their rights. The western world has insisted, in general, on the freedom of individuals to relocate, or emigrate, but the Soviet Union and Eastern-European Communist countries have viewed the situation differently. Restrictive measures and their usefulness depend on their acceptance by the people involved. These are not matters in which westerners can make prescriptions in good conscience. Necessity may demand restrictive measures, but wisdom suggests that incentive is most effective with coercion as a last resort. The aphorism about being able to lead a horse to water, but not being able to make him drink seems true in many situations which involve people also.

Conclusions

Emigration of health professionals is undesirable from the point of view of national governments, but the problem most often involves unsponsored individuals who leave their country of their own free-will to meet their own felt needs. There is reason to believe that many health professionals become unintentional migrants, and decide to remain abroad as a consequence of their experiences and not as a result of premeditation. The Commission on International Education of the American Council on Education in a position paper on the brain drain issue has put forward propositions which probably express the point of view of several countries to which emigrants are attracted:

As a free society, the United States should be reluctant on principle in any way to risk jeopardizing the motivations, rights, and dignities of the talented foreign scholar or professional, by arbitrarily circumscribing his mobility or his choice of permanent residence. Our colleges and universities have at least an equal obligation. We have traditionally preserved a wide latitude for the individual choices of our own scholars, in the belief that free development of intellectual resources is essential both for the individual and for society. We should adopt any other posture toward the foreign scholar, qua foreign scholar, at considerable peril.

The American academic institutions will best further the legitimate purposes of the foreign scholar and his government, of our own government and of itself, if its relationships to the foreign scholar are professionally and educationally bounded. The institution's first task is to provide the talented foreign individual with the best opportunities it can afford for free intellectual growth. Its primary concern is the development of his talent and skill, not that he is foreign.

The United States should not, indeed cannot, counter the advantages it represents to individual foreign scholars, nor can our educational institutions. Even if it were possible to do so, such a policy would be negative and very possibly counterproductive. Positive inducements

for individuals of talent and skill to return to the countries of origin (although extremely difficult to provide in the nature of the case) appear to represent a more practical avenue to meeting the brain drain problem than negative restrictions against remaining in the United states. Such positive inducements can best be provided by the countries of origin. These countries should be encouraged to accept this responsibility."

In the special case of the United States, it is the only major world power today which has arisen through immigration. Immigration has been an important source of manpower from its beginnings. The likelihood that self-supporting skilled persons seeking admission will be denied entry through restrictive legislation is remote, and thus remedies are more effectively achieved by actions taken in the country of origin.

Despite the difficulties, developing countries should make more strenuous efforts to provide opportunities and training programs that will induce their nationals to remain home, or to train abroad only for brief periods. If a country fails to give sufficient priority to such efforts, its case for international protection is not very compelling. Developed countries can most meaningfully assume cooperative responsibilities and provide technical assistance where needed. Cooperative efforts can most easily be conjoined in bilateral arrangements between the countries involved. Multilateral organizations cannot easily deal with inherently political obstacles which must be surmounted in the process of stemming

migratory flow. Agencies such as W.H.O. can be of assistance if they serve in an advisory capacity with respect to preventive and restorative remedies. Restrictive remedies are better initiated by individual countries. The rights of the state and the rights of the individual are often in conflict where brain drain is the issue. Since this conflict revolves around propositions regarded as politically axiomatic, these decisions cannot be prudently questioned by outsiders.

The United States and other developed countries have begun to question whether underproduction of health professionals with vacancies being filled through the unintentional migration from other countries to fill unmet need is not eroding other efforts in international development. The U.S., while not actively seeking migrants as is the case with countries like Australia, nonetheless is both attractive to, and receptive of migrant professionals. Irrespective of the factors which attract migrant professionals, a strong argument can be made for the developed countries expanding educational facilities to a point where it is not necessary to depend on migrants to take up the slack in the system through unintentional migration. It is less than responsible behavior for one wing of government to be involved in developing human resources abroad, while another wing of government either through laissez faire, or the absence of policy indirectly encourages emigration of the skilled human resources already developed.

The international migration of talent and skills is an important, indeed crucial matter. International cooperation is necessary if change is to occur and only a dialogue between the "senders" and the "receivers" can identify points at which effective action can be taken. Fortunately, the dialogue has begun.

Chapter VII

ORGANIZATION AND IMPLEMENTATION OF HEALTH MANPOWER PLANNING

The Planning Function

A considerable literature has accumulated about the organization of general economic planning though, as Harbison and Myers point out, very little has been written so far about manpower planning.^a This is particularly unfortunate since the special problems of manpower planning cannot be entirely managed by the traditional planning mechanism in use.

The same observations made about general manpower planning can also be made for health manpower planning. In the citations we have made to manpower planning and plans, few make reference to either past experience or future objectives of the planning process itself. Therefore, we offer our observations on the organization of the health manpower planning function in full recognition of their tentative nature.

Perhaps the greatest challenge to manpower planners is the wide dispersion of interests and responsibilities for the development of human resources. Regarding health manpower, even in countries with a strong central government and a dominant public sector, planning requires close coordination of at least the ministries of education and health, and in mixed economics, the number of participants in the planning process may be much greater.

^a Harbison, Frederick, and Myers, Charles A. Education, Manpower and Economic Growth: Strategies of human resource development. New York: McGraw-Hill Book Co., 1964, p. 220.

The Peruvian situation is illustrative of the many organizations and institutions that may have to be included in the planning process. On the demand side of the equation, the public sector encompasses eight major sub-systems providing health care, each operating independently of the others and according to its own personnel policies. Each professional group has its own federation and several professions also have a quasi-legal "college" which has been given authority by Congress to regulate the profession and act as its spokesman.

Looking at supply, health professionals are trained in more than 30 schools and faculties. A few of these are administered by the Ministry of Education or of Health but most depend on their respective parent universities. In theory, university policy is coordinated by an inter-university council and its planning office, but in fact, each university is virtually autonomous in deciding which professions to train, in what number, and according to what academic requirements.

In outlining a framework for the institutionalization of health manpower planning, three broad functional areas can be identified: those of technical planning, of policy formulation and coordination, and of administration or policy execution. The sections that follow describe, on the basis of available experience, the types of institutions and institutional relationships apt to be most effective in discharging these functions.

Technical Planning

By "technical planning" is understood those aspects of the planning process -- data collection, analysis, interpretation and the preparation

of plan alternatives that provide a basis on which to choose a course of action. In most countries, especially those in which politics has an inordinately large influence over policy, it will be advantageous for these functions to be discharged by specially designated planning units. Operating agencies seldom have the time to do the necessary baseline analysis, nor are they as free as a planning unit to explore the consequences of all major policy alternatives. Even though a government may elect to decide a given issue on other than its technical merits, it cannot afford to ignore the probable consequences of its decision. This is especially true in manpower planning where the strong pressures created by a professional group may induce the government to adopt a policy whose consequences will take a long time to outlive.

In countries committed to planning, there will probably be planning units in both the education and health sectors. To avoid jurisdictional dispute among them over health manpower, there must be a clear delineation of responsibilities and interrelationships. In making this delineation, it is useful to distinguish between two basic planning questions: "What manpower is required?" and "How should it be provided for?"

Without doubt, a planning unit in an operating agency is in a much better position to answer the first question than its counterpart in the education sector.

A striking example of the problems that may arise when both the education and health sector planning units develop independent manpower projections occurred in one developing country. In its projections to 1980, the education planning unit selected, largely on the

basis of international comparisons, a target ratio of one doctor per 1650 population. In contrast, the health planning unit based its estimates on the doctors necessary to satisfy the probable demand for medical care consistent with the economy's ability to pay for it. Table VII-1 shows the medical school capacity needed by 1980 to attain each of these targets.

Table VII-1. ALTERNATIVE PROJECTIONS OF MEDICAL SCHOOL CAPACITY IN 1980 ACCORDING TO THE EDUCATION AND HEALTH SECTOR PLANNING UNITS

	Education Planning Unit	Health Planning Unit
Entering medical students	3,600	600
Last year medical students	1,300	550
Total enrollment (Including pre-med.)	15,700	4,100
Number of medical schools (assuming 75 entering students each)	48	8

Needless to say, the task of developing a clear policy regarding medical education is greatly complicated by the presence of such wide discrepancies between the two government projections.

Once the health planning unit has determined the quantitative and qualitative manpower targets for the health sector, the education planning unit will assume a major role in finding the best means of meeting them. Questions such as the number, location and size of the new facilities needed, faculty requirements, financing and curriculum content will properly be the concern of this unit as well as of the

educational institutions and inter-school associations.

The distinct nature of the two types of planning responsibilities just described in no way obviates the necessity for close coordination between the planning units in the health and education sectors. Ideally this could be accomplished by giving joint appointments in the two planning units to those planners most concerned with health manpower problems. With a small nucleus of staff drawn from both sectors and working principally on health manpower planning, each unit would always know how the priorities and constraints of its counterpart might affect its own plans.

It is hardly necessary to emphasize that a continuing source of statistical data will be a first priority for effective planning. The location of this responsibility is still debated among planners, some arguing that the planning unit should have complete control over the statistical agency while others believe that a certain distance should be maintained between the planning and statistical functions.^a We are inclined to favor the latter alternative for two reasons. First, the planning unit may soon become excessively burdened with the daily administration of the statistical agency, to the detriment both of its own planning responsibility and to the functioning of other agencies dependent on statistical information. Second, and in our judgment, more importantly, by completely centralizing the statistical function, the planning unit may lose a very useful means of influencing manpower policy.

This second point deserves elaboration. We have emphasized the diversity of interests that exist in manpower planning. One of the best

^aWaterson, Albert, Development Planning: Lessons of Experience. Baltimore, The Johns Hopkins Press, 1965, pp. 392-3.

ways of decreasing the conflicts of opinion that will inevitably arise among the different groups concerned is to encourage their involvement in the planning process from the very beginning. The collection and processing of statistics provides a ready opportunity for such involvement. To be maximally effective, the planning unit should decentralize as much as possible the responsibility for data collection and even preliminary analysis. Thus, instead of maintaining (or having the central statistical agency maintain) an inventory of the current supply of doctors, dentists, etc., this responsibility could be delegated to the corresponding professional associations. By contracting with each association to maintain the inventory according to defined standards, and providing the necessary technical and financial assistance, the planning unit could obtain the desired information at limited cost. Using the formal agreement for data collection as a base to build on, further ties could be established between the associations and the planning unit by means of collaborative studies on such problems of common interest as emigration, attitudes toward government service, early retirement and modes of practice.

Similar arrangements could be made with individual schools and faculties, and where they exist, inter-school associations. Ties with inter-school associations would be particularly useful as a means of promoting cooperation on manpower problems. The formal link between the planning unit and the inter-school association could be the annual exchange of estimates on the future output of the training institutions (based on admission, enrollments, attrition, etc.) and on future manpower demand. Subsequently, collaborative projects could be developed to

determine whether changes are warranted in training emphasis, to develop standards for certain types of health services, and to experiment with the organization and delivery of care.

In the developed countries, particularly the United States, the importance of planning from the "ground up" and of involving the consumer public in the planning process is frequently emphasized. These objectives have not been so easy to attain in practice. We, too, believe that there is considerable merit in having the planning process start at the level of the community, but are not convinced that this is a very meaningful concept for health manpower planning in a developing country.

Once again, we must emphasize the difference between program planning which is usually short-range and is focussed on individual community needs, and manpower planning, which deals with large aggregates over an extended period of time. In the former situation, it is logical to promote as much local initiative as possible in the planning process; in the latter we think such efforts are largely irrelevant. This is not to say, however, that manpower planning can ever be divorced from what people want. In one way or another, by means of attitude surveys, utilization studies, popular campaigns waged through the communications media, and the political process itself, the public's expressed interests must remain central to planning.

Writing about the various forms of authority that enter into the planning process, Chamberlain describes what he terms the "authority of knowledge."^a This refers to a phenomenon that has occurred throughout

^aChamberlain, Neil W., Private and Public Planning, New York: McGraw-Hill Book Co., 1965, p. 194.

society; that as man applies technology to the solution of his problems, the traditional decision-making functions of the executive have become progressively more circumscribed by technician specialists.

This phenomenon is mirrored in the problems that arise in manpower planning. In the day-to-day management of health manpower, the administrator, whether he be dean of a professional school or director of a health program, still reigns supreme. When the focus shifts from the present to the future, however, new concepts are introduced which he is often poorly equipped to understand. Planners now speak of productivity, cost-benefit ratios, skill substitutibility, open-ended careers, "contribution to development" and manpower "mixes." For a while, use of these concepts, dressed up in planning jargon, will impress and even persuade. But as soon as the language of the planners is translated into substantive institutional change, a counter-reaction is almost certain to arise. Incapable of refuting the planners' arguments on technical grounds, administrators and political authorities, in their efforts to maintain the status quo, soon fall back on the time-honored argument of the "superiority of practical experience."

To avoid these dangers, and above all to make the authority of knowledge operate to their benefit, planners must make planning credible. Terminology should be simple and straightforward, the consequences of alternative policies clearly expressed, and above all else, a planning attitude and competence should be promoted throughout the institutions affected. The final test of decentralization is not whether the final health manpower plan is prepared in one or several agencies, the first alternative clearly being preferable. Rather, it is whether the planning

unit has been successful in parcelling out responsibility for answering specific and limited planning questions to the agencies most apt to be involved. Ways of accomplishing these objectives through the decentralization of statistical and research functions have already been mentioned.

Summarizing what we have said to this point about the organization of technical planning, the following points have been made:

- (1) That the health planning unit should have primary responsibility for determining the quantitative and qualitative requirements for health manpower and the education planning unit for deciding how these requirements can best be met.
- (2) That the health and education planning units should closely and continuously coordinate their efforts as they relate to health manpower. This can best be done if a nucleus of planning personnel are designated to assume primary responsibility in this area and are given joint appointments in the two units.
- (3) That the health planning unit should decentralize its statistical functions to the greatest extent possible, partly to reduce its own work load but even more importantly, to bring other groups interested in manpower into the planning process.
- (4) Although the public's interests must remain the central focus of any health planning, it is probably not realistic in most developing nations to attempt direct involvement of local community groups in health manpower planning.

- (5) The health planning unit should strengthen its relationship with educational institutions and professional associations by promoting and/or contracting for applied research projects on matters of mutual interest.
- (6) Planning terminology should be simple and plan presentation should clearly show the costs, benefits, and necessary implementing steps of each policy alternative.

Policy Formulation and Coordination

High priority should be given to creating a health manpower board as the best mechanism to formulate and coordinate manpower policy among the various interest groups. Although lacking executive authority, the board, by virtue of the stature of its members and the impartial review it would make of all matters brought before it, could have a powerful effect on implementation. Once a national decision had been reached on an important matter, few institutions would be willing to step far out of line.

Board composition would include representatives of the educational institutions, the major agencies that employ health manpower, the government, the general public, and the professional associations. In constituting such a board, several precautions are indicated.

First, the health manpower board should be concerned with health manpower alone and its membership should reflect this intention. If a general manpower board exists it may be desirable to make the health manpower board administratively dependent on it, but the former should not absorb the functions of the latter. While we believe it appropriate

hat the health manpower board have lay (non-health) representation on it, the majority of the members should be thoroughly familiar with the characteristics of the health sector and its requirements. Otherwise, there is a risk that the board will give insufficient attention to the important issues of quality, productivity, and improving the "mix" of different types and levels of health workers.

It is generally accepted that planning will be successful only to the extent that the government itself is committed to the objectives and is willing to take the necessary steps to ensure implementation.^{a, b} To attain this commitment, the health manpower board should have contacts as close to the top level of governmental authority as possible. In some countries the advantages of this policy may be so offset by the dangers of partisan political interference that less satisfactory arrangements will have to be found. However, it must be realized that technical solutions to manpower problems that neither take into account political realities nor enlist the support of the political authority will have little chance of success, regardless of their merits.

A third requirement for the effective operation of the board is a highly trained staff. In the case of general manpower planning, Harbison and Myers recommend a manpower secretariat in addition to, and somewhat independent of, the regular planning units within the various operating agencies of the government.^c We consider it equally important

^a Ibid., pp. 225-226.

^b Waterson, Albert, Op cit., p. 340.

^c Harbison, Frederick, and Myers, Charles A., Op cit., p. 220.

that the health manpower board benefit from competent and continuing staff services but believe that for all but the largest countries, these functions should be fulfilled by the regular planning units within the education and health sectors. In general manpower planning the number of agencies concerned is so great that a special manpower board secretariat can be justified to help collate and interpret the vast amount of data required by the board. With many less agencies concerned with health manpower, it would be a needless duplication of technical bodies and a waste of scarce personnel to establish a special secretariat for the health manpower board.

The effectiveness of the health manpower board will in large measure depend on the types of problems brought before it and the care used in preparing them for board consideration. The planners acting as board secretariat should neither burden the board with details nor consult it so seldom or so perfunctorily that the board loses sight of its primary role. Questions appropriate for board consideration could include: (1) should major changes be made in the supply of the various categories of health manpower; (2) by what means should such changes be effected; (3) should a new type of health worker be trained; (4) should major modifications be made in the curriculum of an existing personnel category; and (5) should new legislation governing the mode of practice be requested.

It may not always be possible, or even desirable, to create a health manpower board. In Peru, when this possibility was discussed, the dominant opinion was that although this sort of coordinating and

policy-making body made sense conceptually, similar high-level boards had tended to be ineffectual in the past. Meetings were infrequent and the agenda inadequately prepared. Further difficulties were encountered in selecting appropriate members. If they were of high enough rank to be able to speak for their respective organizations, they rarely had the time to devote to the meetings. Conversely, if they had the time, it usually meant they operated at too low a level to be effective.

In a country where such considerations are of importance, the technical level of the planning function must bear proportionally greater responsibilities. This should not present any unusual difficulties if government control over higher education is strong and the operating agencies not too fragmented. When these conditions are not fulfilled, those at the technical level may find the absence of a manpower board a considerable handicap. Some of the ways of minimizing these problems were discussed in the preceding section.

Policy Execution

We wish to state at the outset that we consider implementation as an integral part of the planning process. The effective planner cannot divorce plan formulation from execution. As Waterston aptly puts it, "Planning may begin with the formulation of a plan as a guide to implementation, but implementation becomes, at a later stage, a guide to revision of the original plan"^a. The two phases blend, one into the other, to form an organic whole that constitutes the essence

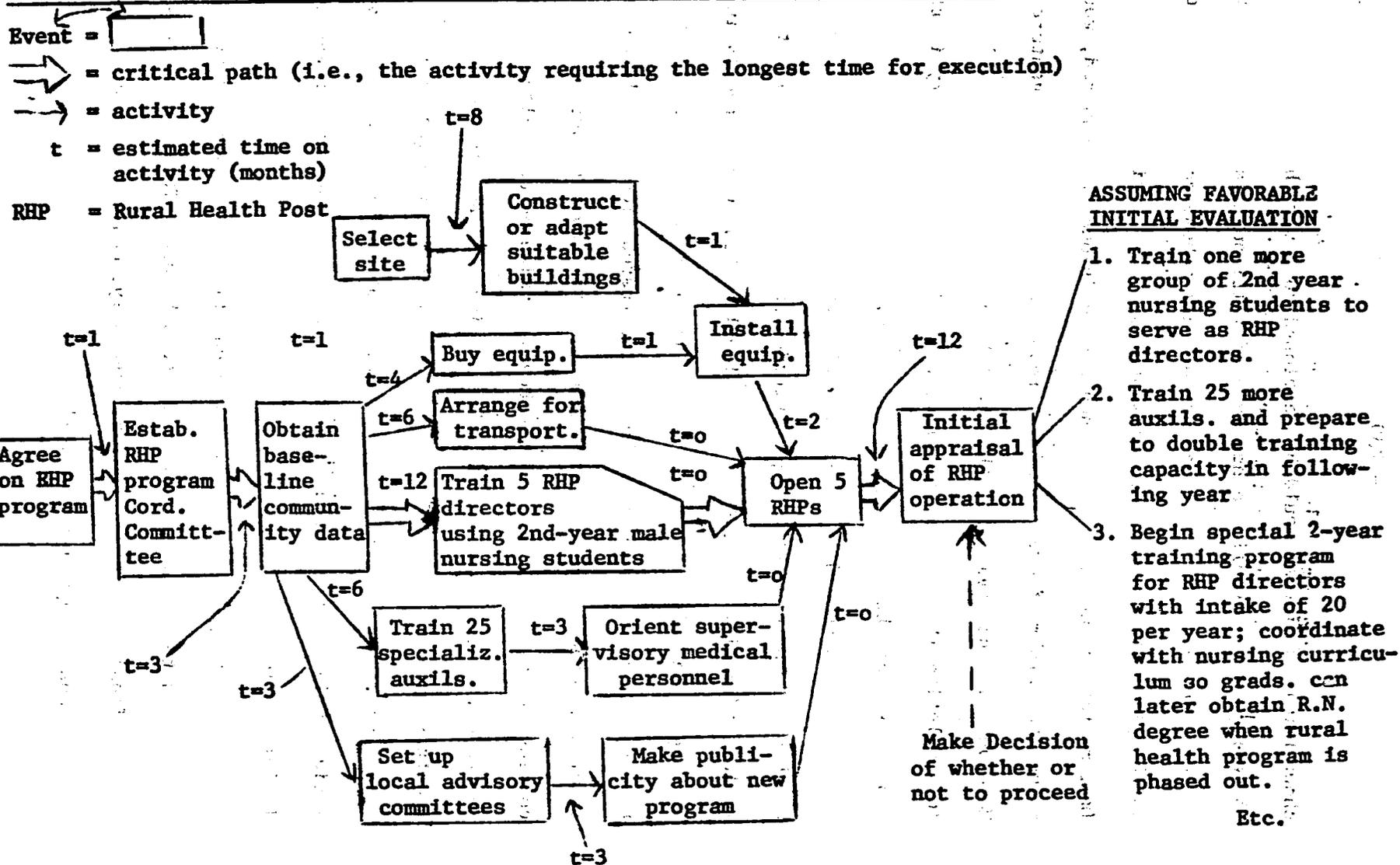
^a Waterston, Op cit., p. 336.

of good planning. Previous chapters have already considered some of the factors conducive to successful implementation. One of the most important, hardly needing further emphasis since it has been a dominant theme in this monograph, is to provide a realistic plan. Not only must the manpower projections "smell right" -- in the terminology of the shoe-leather epidemiologist -- but the recommended policy changes must be politically and administratively feasible. Too often the planner assesses only the economic or manpower consequences of alternative policies, while failing to take into account the natural resistance to change. An idealized scheme is presented, which, because of the long planning period used, may vary substantially from the existing manpower pattern. Unless a fair degree of agreement already exists as to the objectives of future policy, plan proposals may receive scant consideration.

Besides being realistic, a good plan must clearly specify what implementing steps are necessary and when. The detail in which these steps are set forth in a given country will, of course, depend on the degree of centralized control that exists over manpower policies. If the various training programs are highly interdependent, or the lack of data or agreement on key issues makes for much uncertainty, it may be desirable to indicate several major points during plan execution where a reassessment is needed. Thus, the first phase of a manpower plan might be depicted by means of a network diagram as is used in the "program evaluation and review technique" (PERT) of planning^a. Figure VII-1

^a For a more detailed review of the application of PERT (or the "critical path" technique) to health planning, see, "PERT and Planning for Health Programs," by Walter Merten, Public Health Reports, 81:449-454 May 1966.

Figure VII-1 HYPOTHETICAL NETWORK DIAGRAM FOR THE INITIAL PHASE OF A NEW RURAL HEALTH PROGRAM
BASED ON MULTI-AUXILIARY HEALTH POSTS



shows how this diagram could be developed to cover the first year of a 15-year plan to establish a new type of multi-auxiliary Health Post in rural communities. Although the overall scheme could be outlined in the plan, the diagrammatic presentation would facilitate early implementation and, by showing when new decisions are required, would reduce the risks of over-committing resources on an untried venture. Moreover, if one segment of the "health manpower system" is delayed in completing its part of the plan, the adjustments necessary in the other parts can be more readily discerned.

Planners should begin early during the phase of plan formulation to think of the need to change attitudes and to foster a "will to implement" policy recommendations. Ideally this means directly involving in the planning process those likely to be affected by the resulting plans. At the very least, interested groups should be invited to present depositions to the planners on the key manpower issues under consideration, as was done by the Royal Commission on Health Services in Canada. Alternatively, periodic meetings can be held between planners and those affected by plans to exchange views and promote common objectives. Our experience with meetings of this type in Turkey and India convinces us of their usefulness in paving the way for eventual implementation.

Once the plan enters the implementation phase, various measures can be used to advance it according to schedule. The most obvious is through financial incentives, or conversely, controls. Examples of those in most frequent use include:

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 REPRODUIT DES ARCHIVES NATIONALES DU CANADA

Grants-in-aid or traineeships for students choosing high priority disciplines;

Fellowships for graduate professionals to upgrade their qualifications or divert them into high priority specialties;

Grants to educational institutions to expand training capacity and/or modify curricula;

Salary bonuses and other financial (and non-financial) incentives to promote improved geographic distribution;

Improved salary scales for certain high priority manpower categories to make these disciplines more attractive;

Contracts between health and educational institutions for the preparation of specified numbers of middle- and auxiliary-level personnel;

Making institutional and/or individual remuneration partly dependent on productivity, while maintaining a defined level of quality.

In using these and other methods to promote implementation, a word of caution is appropriate. For most situations the problem is not so much one of devising a suitable inducement but rather of limiting its use to only the specified purpose. By way of example, as an inducement to geographic redistribution the cost of gradually implementing a 25 percent salary bonus for professionals working in small communities would not be great; in Turkey or Peru public sector expenditures would be increased by about five percent. Here the greatest potential obstacle is not lack of funds but the failure to achieve broad support from all interested groups for a redistribution policy. With most health workers committed to urban living, ways are soon found to either take away the promised bonus or to use it as a

lever to increase salaries generally. Similarly, other types of financial incentives tend to be quickly circumvented or neutralized if a workable agreement is not first attained on priorities and objectives.

Policy implementation can also be promoted by means of licensing and employment standards. If a government job (or professional advancement) in a given personnel category is open only to those with defined qualifications, educational institutions will be strongly motivated to adjust their training programs accordingly.

In our experience, however, such standards are often applied inappropriately. The length of training becomes the sole criterion of adequacy and not the acquisition of a minimum set of skills. As a result, the standard either becomes unattainable, and hence ignored, or it leads to a wasteful investment in education.

One further method of promoting implementation deserves mention. In some situations the measures already discussed may have little application. This is particularly apt to occur within public sector health agencies regarding the utilization of health manpower. With qualified senior administrative staff scarce, reforms essential to plan implementation may be delayed or ineffectively applied. To overcome such problems the government may find it convenient to maintain a small cadre of highly skilled "administrative troubleshooters," available for short-term assignment where needed. Thus, when an incipient bottleneck appears in an agency subdivision, a senior administrator could be given temporary advisory or even executive responsibility to avert it. Once the hard (and often unpopular) decisions are made, implementation

started, and the regular staff oriented as to their continuing functions, the senior administrator could withdraw. The U.S. Public Health Service has successfully used this method for many years in its efforts to improve state health programs.

Implications of Manpower Planning
for Research, Demonstration and Training

Manpower planning must be translated into action. This requires applied research, demonstration and training. Projects of importance in these three areas are outlined below.

Research

Manpower Utilization. Manpower research must be based on the study of health services. Functional analysis of existing health services will provide a basis for improving the utilization of health personnel. Only as each function is clearly defined in quantitative and qualitative terms is it possible to decide how it can best be performed. Within this general area of research there are a number of specific topics requiring intensive study.

- (1) What services are needed? The health functions performed by health centers, hospitals and, if the research proves possible, private practitioners should be analyzed to determine:

Which functions are given highest priority by the people served?

What does each function cost, according to who performs the activities?

Eventually, such studies should lead to research on the impact of health programs in promoting economic development.

(2) What quality of services should be provided?

The productivity of each type of health worker should be studied. This requires better methods of studying inputs, partly covered in the functional analysis above. It also requires improved measures of health output. In addition to standard health indices, other benefits include changes in health practices and attitudes, and the extent to which specified program objectives are achieved in areas such as mass immunization.

The determination of acceptable standards of quality for countries at different levels of economic development requires a judicious balance of diplomacy and realism. Research on quality of care is often evaded because of unrealistic statements that no one should be discriminated against even though it is manifestly impossible to provide high quality care for everyone. Better planning requires that methods be discovered to allocate to each function that level of manpower needed for optimum and efficient performance. Examples of questions to be asked are: To maintain qualitative standards, which functions require the competence and skills of professionals; which functions can be most economically and effectively delegated to ancillary workers; and how can patient satisfaction be best balanced with personnel satisfaction?

(3) Organization of services. The administrative framework can determine in large part the effective utilization of health manpower. Systems analysis approaches are needed to evaluate specific problems such as:

What is the appropriate manpower mix for each unit of the health services? This requires particular attention to the balance of professional and ancillary workers, their team relationships and their respective roles.

What are the best patterns of supervision, continuing education and communication, especially through routine records, among and within various units?

What are the best ways of paying for the various components of the health services, giving particular attention to the balance of private and public funds?

(4) Distribution of services.

In most developing countries the greatest manpower shortages are in rural areas. In research on rural requirements of health personnel particular attention should be paid to ancillary workers. Some questions that must be answered are: Should they be specialists or generalists; at what level of preparation - curative or preventive or both; and how much independence can they be given in isolated posts?

Other special population groups also have inadequate services and similar studies should be done on ways of meeting their needs. Of increasing importance are the problems of the rapidly growing urban slums.

In all efforts to achieve better distribution, the questions most needing study are problems of personnel motivation. What incentives are most effective in getting personnel to go where they are needed and to work there effectively? Under the important economic incentives, what are the relative benefits of full- or part-time salary arrangements for doctors and special ancillary groups such as midwives?

(5) Demand Analysis. The most difficult part of health manpower analysis is projection of effective economic demand. Research is particularly needed on:

The effect of changes in age composition of the population, per capita income, education levels and urbanization.

Shifting patterns resulting from administrative reorganization and the segmental requirements of particular sectors of the general health services.

Educational Research. Educational planning and the determination of educational objectives must be based on better job definition. Studies of manpower utilization should help to define the work expected of each category of health worker. Particular educational problems requiring concentrated research are:

- (1) The definition of educational patterns adapted to the specific needs of each country.

For doctors this requires research particularly on how the community and preventive orientation can best be incorporated. Research is needed on the use of community teaching facilities. In postgraduate education the balance between general and specialty education must be studied and whether doctors in developing countries should be trained in district general hospitals or specialty teaching hospitals.

Nurses are in particularly short supply in all areas. To meet this need particular attention must be paid to defining their role and developing suitable educational programs. The status and position of nurses relative to other educational opportunities for women requires special study.

The training programs for all ancillary categories should be studied both in their relationships to each other and the activities for which each is being prepared. Studies of training programs should include much more than curriculum development; with due attention to whether the institutions should be located in rural or urban areas, whether various categories can be trained together, and the balance of practical and theoretical work.

(2) Teaching methods require particular study. Many new developments in subjects such as programmed learning and audiovisual techniques require study to see if they are applicable or can be adapted to local conditions.

(3) The particular problems of international migration of health professionals are of particular interest to the United States. Studies are needed of the dynamics of the world market of physicians and the economic and motivational factors behind present trends.

General Studies of Manpower Supply and Demand. Each country should undertake its own national health manpower studies. These should be part of health planning, and should be built into continuing mechanisms for implementation and further planning. As some of the specific items of

information indicated above become available they will have to be related to overall manpower analyses.

Demonstration

As research points the way to possible solutions for the manpower problems of developing nations, demonstration projects will be needed to show the effectiveness of new methods. Priority demonstration projects are:

- (1) New methods of training health auxiliaries.
- (2) Functional relationships in demonstration health centers with special attention to appropriate delegation of responsibility to ancillary personnel.
- (3) Modification of existing medical care programs to secure greater productivity while maintaining acceptable quality.
- (4) Trial of various patterns of regionalization of health services in geographical areas with a wide range of institutions and health units.
- (5) The improved use of supervision and continuing education in increasing the effectiveness of control of the work of various levels of health manpower.

Training.

As developing nations increase their appreciation of, and interest in health planning, it will be necessary to prepare increasing numbers of health planners who should be trained specifically in health manpower analysis.

The greatest health manpower need in most developing countries is for trained ancillary personnel. To meet this need, the development of special training programs for the teachers and directors of ancillary health training schools should be given the highest priority. Also important for the improvement of both ancillary and professional training is the preparation of appropriate teaching aids such as film strips and programmed teaching curricula in books and machines. The bases for developing these teaching materials will evolve from the research studies already discussed.