

HEALTH MANPOWER IN INTERNATIONAL PERSPECTIVE

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"Those who cannot remember the past are condemned to repeat it."
George Santayana, *The Life of Reason*

Increasing knowledge and a complex technology have greatly expanded man's ability to control his environment and the spread of disease. As medical science has developed, power and resources have accrued to the health service system, but as Rene Dubos has observed, "there is good reason to believe . . . that medical limitations imposed by economic necessity will soon become more stringent than they were in the past."¹ More than ever before questions are now being asked about who should be trained, what types of facilities should be built and what constitutes the optimal distribution of health services.

With the conviction that "health manpower planning cannot remain the scholarly interest of a few research workers . . . (and that) . . . the critical component of the development process requires intensive and serious research, new methodology and accurate data,"² the Department of International Health at the Johns Hopkins University School of Hygiene contracted in 1961 with the Agency for International Development to undertake health manpower surveys in Peru, Taiwan, Turkey and Nigeria. The three completed studies (except Nigeria) are a significant contribution to the small but growing literature in this field, each volume etching the major

health needs, the resources and the facilities of nations on three continents.³⁻⁵ Underscoring the parochialism of most studies of health systems, these volumes depict certain universal characteristics of health service systems everywhere, as well as a bewildering mosaic of social choices that have been attempted in countering overwhelming health problems.

The objectives of the three studies were:

1. To identify the current supply of medical personnel and the demand for their services.
2. To analyze the structure (public and private) of the health sector.
3. To analyze the education of health professionals.
4. To estimate the current economic demand for health services.
5. To project the supply of health personnel to the future.
6. To project the demand in the future for the services of health personnel.
7. To determine the balance of supply and demand.
8. To suggest corrective measures for imbalances between the supply and the demand for health personnel and facilities.

Some of the major findings, the concepts and the methods used in these studies are reviewed here as well as the questions the results evoke.

SELECTED FINDINGS

Because of the enormity and the cost of the task, no attempt was made in these surveys to gauge directly the actual morbidity of the diseases that were afflicting the population. The information that is available is of tragic and profound proportions. The conclusion of the Turkish study is applicable to Peru and Taiwan. "It will be virtually impossible to do much about the health care of the 70 per cent of the Turkish population who live in villages until there is a continuing

mechanism for maintaining professional contact with these people.”⁶ The characteristics of the nations that are in the process of becoming industrialized—or in those regions of the more affluent countries where such development has not occurred extensively—are prevalent in Peru, Taiwan and Turkey: high crude birthrates, high infant mortality rates, high death rates, a relatively short life expectancy and high rates of natural increase. In each nation the reported rates (all of which are incomplete and of questionable reliability) for diarrhea-enteritis, diphtheria, dysentery, syphilis and other infectious diseases account for a high proportion of the death rate. These conditions result from the shortage of health personnel in many areas and the virtual absence of water purification and sewage disposal systems. Because census-taking has been erratic, difficult and, on occasion, politically dangerous, and in the absence of sickness surveys, relevant comparisons between the three countries on these points can be made only in the most general terms.

The funding, the organization and the distribution of health services vary considerably from country to country. Government expenditures, for example, in Peru account for 19.0 per cent of the Gross National Product and between 13 and 16 per cent of this amount is spent on health. The state supports 87 per cent of the country's hospital beds, contributes 67 per cent of the income earned by physicians and employs 91 per cent of the nurses. In 1957, the Ministry of Health created an Office of Planning, Co-ordination and Evaluation, which was subsequently incorporated into a national system for planning and social development. Since its establishment the planning office has been concerned with the training of health planners, the health manpower study reviewed here and the rationalization of Ministry of Health administrative services. A National Health Plan for 1966–1970 has been developed.

Government figures of central government expenditures on health for Taiwan have not been published, but it is estimated that the private health sector accounts for over 90 per cent

of all health services. Approximately 30 per cent of Taiwanese doctors, a third of the midwives and all qualified nurses work in government service. Most of the hospitals in the country are operated by either municipalities or counties. The Taiwanese Ten Year Health Plan calls for increasing or at least maintaining the current government health expenditures.

The Turkish government also plays a dominant role in the health sector and introduced a nationalized health service in 1963. The government is responsible either directly or indirectly for approximately 80 per cent of the country's hospital beds, and 95 per cent of the costs of medical education. Hospital expenditures were 47.3 per cent of total Ministry of Health financial allocations in 1964, of which 11.7 per cent were spent on rural health centers.

The Turkish Five Year Development Plan advocates establishing five new medical schools, and creating, over a 15-year period, a comprehensive national network of preventive and curative services. The proposed model for the regionalization of health services would provide a system of rural health centers serving an average of 7,000 to 10,000 individuals. Each center would have three to five satellite health stations. In 1963, a program established on the pilot basis was introduced in the eastern Turkish province of Mus. To attract health personnel three-year contracts were offered to staff workers, which paid three to four times the usual government salaries; patients were required to pay for only special drugs in case of emergencies. The number of health personnel in Mus rose from 47 to 161 individuals between 1962 and 1963. As expected, the number of total patient visits also increased sharply. Most of the peripheral villages were visited on a regular basis and 30 per cent of the deliveries were attended by midwives. The pilot program in Mus was extended to five additional provinces in 1964; by 1977, it is proposed that the nation will be completely provided with similar services.

As Taylor and his colleagues have noted, a health manpower hourglass characterizes the profile of health occupations in most

developing countries. Physicians and specialists are at the upper end of the hourglass, a limited number of nurses and technicians constitute a slender neck, and the large base consists of herbalists, *saglikis*, *curanderos* and other indigenous health workers. Focusing in depth upon different aspects of health manpower, a census of physicians and nurses was taken in each country. As expected, difficulties were encountered in obtaining reliable information about the gross income and the fee schedules of physicians and a listing of the actual number of patients whom they regularly treated. In Peru, Hall estimated that one-third of the doctors underreported their activities, while 50 per cent inflated their replies. The census of Turkish physicians was complemented by an in-depth attitudinal analysis of 211 graduates which focused on their perceived roles as physicians and their philosophy of practice. The Taiwanese national household survey obtained basic information about household characteristics, the number of reported illnesses and the reported use of various health facilities. Trends in recruitment and admission policies, the design of curricula and faculty staffing patterns for medical and nursing schools were described for each country. In each study difficulty was encountered in locating and sharply defining the number of health workers. In the absence of a complete inventory of doctors and nurses, both life table and cohort methods were used. Because different population denominators were used, on occasion, within a study and in the three studies, relevant comparisons between manpower profiles cannot be made.⁷

In each nation a national development plan or a national health plan has been drafted or implemented, but little is revealed in these studies as to how health was ranked with other broad social priorities and how these collectively were perceived by politicians, health professionals and the population. To what extent has the state sought to implement these programs and what institutional and attitudinal obstacles have been encountered? Despite the shortage of sanitary inspectors and engineers what efforts, if any, have the governments made

to train these types of health workers? Conversely, what factors have contributed in each nation to the proposed significant extension of training programs in medical education? The few clues that are provided to these questions suggest that the various governments, medical societies and other policy making groups have not always strongly endorsed programs for the greater equalization and the distribution of health services and facilities.

“Stop and go” policies regarding the sanctioning and the training of other types of health workers have been followed in each of these nations. Indigenous practitioners such as *curanderos* or partly trained health aides such as *santarios* in Peru provide a significant amount of care to rural inhabitants, yet their numbers are unknown, their functions largely undefined. When the Peruvian government, in 1963, started a rural school of medicine at Cajamarca in the Andes, which would stress training relative to those conditions prevalent among this isolated and primitive population, the medical schools formed an Association of Peruvian Faculties of Medicine that drafted curriculum requirements for any new medical faculty, thus thwarting the government’s program to provide at least minimal medical care for the region. To the Indians of the sierras who have long fought for agrarian reform and who traditionally have had a distrust of the *misti* (the white man), such an upgrading of the curriculum at the Cajamarca medical school would probably be dysfunctional in improving their need for elementary, primary medical care, be perceived as yet another example of the power elite’s indifference to their plight and would probably result in so overtraining those who were graduated that few would remain in medical practice in the region.

In each of the three manpower studies many crucial and sensitive social issues have been minimized or ignored. These issues are as prominent and relevant to any discussion of the health of a population and its medical services as black-white relations in the United States or Brazil, language in Canada, or

caste in India. Mainland Chinese, for example, constitute 15 per cent of Taiwan's population, native Taiwanese 85 per cent. Herbalists provided an estimated 15 million patient visits a year and, in 1963, 83.3 per cent of all births were delivered without medical assistance. Taiwan has two grades of physicians: grade A doctors who are graduates of Taiwanese medical schools; grade B doctors, who are largely preceptor trained or graduates of short courses taken either in mainland China or Taiwan. Training programs for Grade B doctors are now being discontinued.

Most of the Nationalists live in urban centers, clustering in Taipei, and constitute the social and political power elite of that nation (e.g., only one of eight cabinet Ministers and two of 25 members of the Standing Committee of the Nationalist Party Central Committee are Taiwanese, no Taiwanese are ambassadors or police chiefs and so forth).⁹ Opportunities are unequal by nationality for education and promotion at work, intermarriage occurs rarely, the co-existence of two major dialects (Taiwanese and Mandarin) fetters cooperation and, prior to 1969, no elections for national office had been held since the Nationalists left the mainland of China. It seems somewhat improbable, then, in light of these social schisms that an equitable distribution and reorganization of health services in this nation can proceed prior to other fundamental changes in the ethos and structure of Taiwanese society.

Another example of a politically explosive issue that affects not only national expenditures but the allocation of health resources as well is the largely undocumented role of the police and armed forces in each nation. The 600,000 soldiers and their dependents in Peru constituting 5.8 per cent of the population appropriated seven per cent of the nation's hospital beds, 11 per cent of the physicians and 18 per cent of the professional nurses. The full-time Taiwanese army numbered between 300,000 and 400,000 soldiers with an additional 180,000 to 200,000 reservists. This military complex (7.7 per cent of the popu-

lation) accounted for 11 per cent of the physicians and 23 per cent of the pool of professionally trained nurses. Since 1953, 43 per cent of all new medical graduates have been channeled into military service. Candidates of the opposition Kuomintang party alleged in 1969 that the government devotes 78 per cent of its national budget to military expenditures.⁹

Information about the police and armed forces was not released in these countries "for reasons of national security." Were such information available, not only would the health profile of the population be altered, but a more realistic basis for health planning could be established. These various social issues were handled in such a circumspect manner in these volumes that a reader might well be left with illusions about social realities in these nations. Hall believes that what most endangers programs seeking the redistribution of health services "is a failure to achieve broad support from all interested groups."¹⁰ More information than presented in these studies will be required to understand the complex social forces that hinder or facilitate the development of any effective health manpower policy.

Health Manpower Methods

Recognizing that health manpower research is "still in a rudimentary stage of development" each study set forth its assumptions, provided a cryptic review of the literature and developed methods for estimating the current need of and demand for health services. In selecting their methodologies several other approaches that have been used in manpower studies were discarded. Each research team for example, rejected the biologic demand technique first postulated in the 1930's by Lee and Jones, which attempted to gauge manpower requirements on the basis of the actual health needs of a population, as "unworkable" or "only minimally useful." Other approaches implicitly rejected include functional analysis (the study of what health workers actually do), the social priorities of the

population and cost-benefit analyses (or relating specific services to the extent to which they contribute to the alleviation of disease).

Peru. Hall relied on two methods in estimating health manpower needs for the future. The *concept of rationalized demand* was defined as: "the disaggregation of as many different components of the demand for health manpower as is realistically possible, the independent projection to the target year of each of these components with a method most applicable in each case, and then the re-aggregation of the component demands in order to obtain the consolidated projection."¹¹ To estimate the physician manpower hours required, a formula was developed in which the specific services required for each "instrument of health policy" were multiplied by the number of hours per instrument. The results of this equation constituted the basis for two long-term projections for economic growth (moderate and rapid growth models). The second model in the Peruvian study was a straight-line projection that was used to estimate the demand for salaried personnel in private medical institutions based on the staff-bed ratios, hospital discharge rates and population growth trends.

The idea of rationalized demand is analogous to Frederick Harbison and Charles A. Myers' "target-setting approach" in which the goals for manpower are specified, comparisons for specific items are made with other countries and the resultant estimates are converted into educational requirements.¹² In developing his forecasts Hall has assumed that the health plans prepared by the Ministry of Health would be adopted through time, medical education modifications would be introduced and the public-private balance in health expenditures would be maintained that govern the use of hospital beds and physicians' time.

Hall recognized the major dilemma inherent in rationalized demand, when he asserted that it "begs the question of rationalization for what?" Given the structure of Peru, its heterogeneity, the paucity of information on the health needs of the popu-

lation and of a large proportion of its health manpower pool, and the lack of a coordinated national thrust in the health sphere, the policymaker realistically has few viable social alternatives from which to choose.

Turkey. The *concept of technically feasible demand* or, concentrating on the “political and administrative machinery to provide the concentrated effort needed to achieve otherwise feasible and realistic goals,”¹³ was the technique advocated in the Turkish study. The researchers relied on three straight-line projections for gauging the demand for health manpower, which were: (1) a supply–attrition model for physicians; (2) the supply and the per cent active in the labor force of nurses; and (3) the current supply of midwives. These three techniques focused solely on the supply of health personnel, not on the need or the demand for services.

Several dilemmas would be encountered in any attempt to replicate the methods used in this study. Although the Turkish study focused on “administratively and technically feasible demand,” little insight was actually given throughout the study to the administrative and political milieu of the country, to the prevailing social values regarding the health and welfare of the population or to those aspects of the various social, educational and political institutions that might be relevant to attain the goals desired in the manpower sphere. No discussion was given of why three different methods were used to gauge the future demand respectively of doctors, nurses or midwives, nor was an attempt made to compare the relative efficacy of these methods. The Turkish study concluded: “major methodological advances have been made in learning how to measure and project demand for health personnel . . . estimates were based largely on technically and administratively feasible demand . . . and economic demand . . . present demand was quantified, projected demand was based on specific assumptions and government plans.”¹⁴ This observation is neither modest nor accurate when the methods that were in fact used are considered, as well as their tenuous relation to providing a deeper insight into the

“political and administrative machinery” of the Turkish health service system.

Taiwan. An unlabeled *model of aggregate demand* was developed in Taiwan, which relied on multivariate analysis to sift the relative contribution to the demand for health services by the population of: economic background, age, education, residence, reported morbidity and sex. The key dependent variable was the number of full-time equivalent (F.T.E.) health personnel required to meet measured demand. Although this approach was used to estimate the future demand for physicians, straight-line projections based on population increase were the basis for estimating the demand for other types of health workers.

Inasmuch as the model of aggregate demand employing a multivariate analysis has probably not been attempted before in health manpower surveys, it would have been instructive in the Taiwanese study to have a more complete exposition of the weighting and the categorization of the variables used, and additional information involving the assumptions made regarding population changes, its distribution and the growth of the economy. No intervening or control variables appear to have been used—e.g., varying patterns of hospitalization.

This model is an elegant exercise with great potential as a useful methodologic technique in health manpower studies. In contrast to this innovative approach, which was used in the analysis of Taiwanese physician manpower, the researchers estimated the demand for other health workers by “simple projections based on population increase plus minor estimated corrections for other factors.” They concluded: “predictions based on the use of more time consuming methods would not have differed greatly in absolute numbers of health workers.”¹⁵ The basis for this conclusion is equivocal, because no comparison was made in the text between the multivariate analysis (model of aggregate demand) on the one hand, and the straight-line population projections on the other. Such a comparison could have been attempted for purposes of methodologic comparison

involving only physicians; the necessary information was available for this occupational category. By making this statement the authors appear to refute the utility of the multivariate approach upon which most of their conclusions are based.

Health Manpower in Perspective

Irrespective of national setting, several universal factors characterize the medical profession, the most notable being the trends toward specialization, antipathy to the state and a high rate of emigration. In each country it appears that those with the best qualifications are probably those most likely to emigrate to other countries. Unless such trends are checked, and these studies offer little evidence that such efforts are being made, then, like Alice in Wonderland, these countries will be in the position of running as hard as they can to maintain their present levels of health personnel. Those nations receiving these talented emigrants cannot be obviated from partial responsibility for the vacuum of technical and professional personnel thus created in the developing nations whose health workers are responding to the international professional marketplace.

The dominant assumption underlying these studies is essentially an engineering idea of society, which postulates that facilities and personnel can be distributed and planned for on a rational and predetermined basis. The authors of the Turkish study contended, for example, that "health manpower planning . . . permits . . . the deliberate equalization of services."¹⁶ Manufacturing phrases common to the economist's repertoire are sprinkled throughout the studies: "the current production rate of mid-wives," "the average annual output" of nurse's aides or "the net increment and present rates of production and attrition" of physicians.

Implicit in each study is a rejection of the *status quo*, and a plea for the rational coordination and planning of scarce health resources to cope with the almost overwhelming health needs of the people. But these countries, like other nonsocialist nations are dominated by an ethos seeking to preserve the rights

of the individual and a free market way of doing business. So entrenched are these values in the fabric of each society that it is unlikely that proposals essentially seeking social reform in one segment—such as health services—can be effected without a broader transformation, or even a revolution, of other traditional ways of life. Despite the fact that a national health plan exists in each country, such blueprints have been for the most part ignored and unimplemented. For the state to achieve the called for redistribution of health services would require that its power and mandate be broadened. That this has not happened for various reasons in each nation results from the state's reluctance to expand unilaterally its power in one sector more than in others, a decision that has been buttressed by many in the health sphere itself. It is ironic that these studies should call for reform in the organization of health services without recognizing the broader implications of their recommendations.

Between revolution and a laissez-faire approach, the state has few alternatives from which to choose. Intermediate steps involving both incentives and a limited range of controls emerge as alternatives. But incentive programs such as the one adopted in the eastern Turkish province of Mus, or restricting the number of available positions in various regions under a national health service (e. g., Chile and United Kingdom) are alternatives that are still relatively rare and their long-range impact on the redistribution of health services has been insufficiently analyzed.

What is the appropriate mix of health personnel? The three research teams strove meticulously to avoid international comparisons between the developing and the more affluent nations, attempting for the most part to base their recommendations on the findings derived from the detailed case studies. However, from time to time such invidious comparisons were made where, for example, in Taiwan, it was concluded that: "two good, established medical schools" were in operation. Perhaps such comparisons cannot be avoided, but the unanticipated consequence of such studies whose initiative came from a dedi-

cated group of researchers, not from the host nations may well accelerate the momentum toward adopting European and North American models of medical education and the delivery of health services that would be inappropriate to meet the predominant health needs of the people of these nations.

A medical model of health manpower has been used in these studies, which has disproportionately spotlighted the role of the physician. Adoption of this approach has resulted in the use of the more sophisticated methodologic techniques and large portions of the three texts being devoted to the study of physicians. Other workers such as clerical workers, craftsmen, laborers and others who constitute a large proportion of the health services industry and who might have provided a ready pool for an analysis of their job functions were barely considered. What is now called for in these types of studies in the future is a creative interdisciplinary effort to combine such findings with in-depth analyses of the sociology of the professions, of work and of the health service system in each nation. Such a fusion of interests might well yield a more realistic basis than presented in these volumes for the projection of what is socially feasible in health manpower planning.

The methods that have been used in these studies (supply, demand and target-setting approach), the unrivaled wealth of available information and the shared concern of the three research teams have created an ideal opportunity for a comparison of the relevance and accuracy of the projections that have been generated. Too little is known about the efficacy of manpower methods; their selection and use often appear to have been made on a hit-or-miss or common sense basis, or, on occasion, adapted to the exigencies of the information that can be conveniently collected. The Department of International Health in a summary volume being prepared could compare internally for each nation and between the three nations the relative utility of the methods used, the basic assumptions underlying each technique, the types of information required and the limitations inherent in each approach. Such a comparison

would be an important by-product of these studies, and might provide a basis for policymakers in the future to select methods for studies in this area on a more rational basis with a clearer appreciation than at present of the probable outcomes and the limitations that would be involved in using these techniques.

These volumes are required reading by all those who are concerned with health manpower and the operation of health services. The Department of International Health at the Johns Hopkins University and those associated with these projects have prepared lucid case studies that will become indispensable references in the future. That all of their assumptions and recommendations cannot be accepted, and that the utility of some of their methodologies have been challenged, does not detract from the magnitude of what has been accomplished.

No reader can leave these volumes without being sobered by the discrepancy between what is and what might be, and with a sense of pessimism about the likelihood for the reorganization of health services in these developing nations. The studies have raised uncomfortable questions for both politicians and medical leaders. If the findings, the methods and the recommendations are to achieve their potential relevance, then, as Thomas L. Hall concluded: "it will not be too early three years from now to test the validity of the major findings and conclusions . . . in five years it will be too late."¹⁷ Three years have elapsed since the first study was published; time is running out for this challenge to be accepted by these researchers or by others.