

REALISTIC REALIGNMENT OF HEALTH WORKER JOB RESPONSIBILITIES

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Health care in many developing countries has been based upon the concept of specialized categorical programs to serve the bulk of the population, combined with sophisticated, comprehensive services for the elite. As these nations increasingly turn their attention to means of providing general population coverage of basic health services, they have tended to mimic the classical systems of physician-based primary care that have long served as the norm in the developed world. Experience in this direction has been generally unsatisfactory, for developing countries are usually rural societies whose severely limited health manpower and other resources are largely concentrated in urban centers.

Meanwhile the acceleration of medical care costs in developed countries, notably the United States, coupled with the continuing difficulty of access to primary care at any cost for large segments of the population, have raised questions concerning the appropriateness of the aforementioned norm, even in this setting.

Need for Systems Analysis of Health Care Delivery

It is clear that the development of methodology for the comprehensive assessment of health care delivery systems is of sufficiently general concern to be greeted with interest in a wide range of settings. For the past several years a group of us at The Johns Hopkins School of Public Health have been engaged in such methodological research, and this

*Based upon a paper presented by the author at the 20th International Meeting of the Institute of Management Sciences, Tel Aviv, June 27, 1973.

paper is intended first to summarize our approach to the problem and then to review some of the implications of our findings. We selected certain rural areas of India as our primary field research focus because of our earlier work there. This proved to have the additional advantage of offering a relatively simplified environment for a comprehensive systems analysis, which at best is a complex undertaking. In India defined community development blocks comprised of roughly 80,000 population are each provided with a government health center and associated sub-centers organized to deliver comprehensive, preventive and curative health services.

Research Aims and Design

In general, our aim was to develop a methodology for measuring levels of community health need and the utilization of resources in response to these needs. This led to the formulation of six specific research objectives as follows: (1) to measure COMMUNITY HEALTH NEEDS with particular attention to developing a better basis for setting priorities among them; (2) to measure the quantity and quality of HEALTH RESOURCES currently available for health programs; (3) to identify ways in which health resources are currently embodied in HEALTH SERVICES to satisfy effective demand for care; (4) to quantify specific ACTIVITIES of health center staff both at the center and in the community; (5) to define desirable and practical ALTERNATIVES FOR THE REORGANIZATION of health centers in terms of both program priorities and job descriptions; and (6) to identify the implications of modified health center personnel job descriptions for PROFESSIONAL AND AUXILIARY TRAINING.

The first four objectives concern the systematic collection and organization of information in order to make decisions in accordance with the last two objectives. A major product of our research, therefore, has been a streamlined Functional Information Generating System (FIGS) which represents what we consider to be the minimum array of health needs and services information necessary for meaningful comprehensive appraisal.

In developing the framework of analysis for the study we consciously attempted to avoid classification according to traditional stereotypes such as "nursing care" or "pediatric care." Instead we sought to identify functional categories, i.e. areas of responsibility, that could be examined relatively independently as sub-systems without reflecting emotional pre-conceptions of individual worker roles. After considerable trial and error we established the five functional categories of Table 1 as useful representations of major areas of operational responsibility in India. Additional categories, including mental health and general health education, were identified but were found to be relatively undeveloped in the study setting.

Within each of the functional areas we quantified particular needs in a form that could be recognized at the community level and at the same time was compatible with the measurement of specific units of service. Thus, for example, we considered such things as "number of persons with smallpox vaccinations within the previous three years" and "number of houses sprayed with insecticides within the previous fortnight."

Apart from the measurement of units of service provided in relation to need, we identified two other service dimensions. First, we noted the

amount of time spent by each category of worker in performing specific service activities, and secondly we accounted for the various components of fixed and recurring cost.

The analytical framework portrayed in Table 1 requires both a community perspective and a health services activity and cost analysis. While some of the requisite information is readily available from routine records we found it necessary to mount two types of special surveys: a community health status and utilization study and an industrial engineering-type work sampling. Although neither type of survey instrument is unique, the manner in which they were combined for present purposes deserves some further elaboration.

Four community development blocks (CDBs) were selected for investigation in two different States. Within each CDB three villages were chosen for community survey purposes so as to reflect varying degrees of health center accessibility. Twenty-five households per village were then randomly selected for 26 fortnightly interviews during the course of an entire year in order to ascertain: (1) general characteristics of the family and its resident members, (2) incidence and nature of morbidity experience of individuals during the two weeks prior to interview, (3) patterns of seeking health care and associated expenses incurred, and (4) the number and nature of health services contacts experienced during the period since the last interview. By means of repeated interviews we were able to establish profiles of need and health action throughout entire episodes of illness without having to rely upon faulty long-term respondent recall.

In the activity analysis we had to distinguish between those conducted at the health center itself and those taking place in the field. In the former case instantaneous intermittent observations were made at two-minute intervals throughout the workday, the worker to be observed at any point in time being determined randomly. In the field it was necessary for the observer to stay with a single worker throughout the day, but we found it most convenient in this case also to employ the intermittent observation procedure. In addition, however, the observer maintained a field log of all worker service contacts by type and location of contact.

Illustrative Findings

In all we gained over 60,000 person-fortnights of experience from the community survey and nearly 40,000 work sampling observations to insert into the analytical matrix outlined in Table 1. Rather than pursue the analysis in detail here, however, we shall simply present selected illustrative compilations as a basis for discussing in the next section the general value and implications of the research. Since the pattern of results differed somewhat between the two study States, the following tabulations are limited to the two CDBs investigated in Punjab State. Moreover, we must caution the reader that even these limited findings are not meant to be representative of the entire State but only serve to exemplify the methodology employed.

First of all we examine in Table 2 the way in which health center staff as a whole was found to allocate time to service and other activities. We find that direct-service time was less than half that spent in supportive activities and accounts for less than one-sixth of total work time. We might

add that the "records and reports" component of supportive effort by itself accounts for more time than all direct-service activities combined.

Within the direct-service category we see from Table 3 that communicable diseases control was by far the most important health center function, whereas environmental sanitation was virtually neglected. It is interesting to note further that curative service activities represented less than one-fourth of the total health center service effort.

Looking more specifically at individual worker roles in Table 4, several significant patterns emerge. The provision of curative services was found to be a joint responsibility involving substantial input from the pharmacist, auxiliary nurse-midwife, dresser, and local midwife, in addition to that of the doctor. In contrast, communicable diseases control, while important in the overall picture, was almost exclusively the domain of the basic health worker and the laboratory technician. Interestingly, the auxiliary nurse-midwife, not the doctor, turned out to be the basic multi-purpose health worker, contributing in a major way to curative, personal preventive, and family planning services. Finally, the health center itself was seen to be a focus for medical care services, whereas all functions, including medical care, were provided in the field.

The community survey was especially informative concerning the medical care function, in part because it produced data on care received outside the health center system. The community population base for purposes of analysis was the total person-fortnights at risk, i.e. the total of individual two-week histories obtained through interview. A major element of the analysis, summarized in Table 5, was a three-step compilation of findings beginning with the determination of that portion

of person-fortnights with reported morbidity. At the second stage we ascertained the number of morbidity (problem) cases that involved practitioner consultation. Finally, we established the number of visits made by those who obtained consultation. At each of the last two stages we made the distinction between care received at the health center and that received elsewhere.

This segmented approach was helpful in interpreting area differences. We observed, for example, that Punjab Block B generated twice as many service contacts (3,289) as Block A (1,512), but initially it was not clear whether this was because the Block B population experienced more illness, whether sick persons in that area were more inclined to seek care, or whether those seeking care utilized the health services more intensively. In reviewing the various rates produced by the segmented analysis, we were able to determine that each of these factors played a role, but the difference in consultation rates between blocks appeared to be especially significant.

In neither block did the health center provide as much as one-fourth of the total curative services rendered to the population at risk. Combining this information with that recorded in Table 3, we conclude that the primary health center's role principally concerned non-curative functions, whereas curative services were for the most part provided by unqualified indigenous practitioners.

Applications of the Methodology

Routine Evaluation of Service Activities

The field research aspect of the investigation summarized above has now been concluded and has yielded a streamlined information system and study design for routine administrative application. This simplified study design

permits five investigators working within an existing state or provincial Health Services Planning and Evaluation unit to collect the minimum body of requisite information in the course of a few weeks and to organize the data within a functional framework for analytical purposes. At the present time the Planning and Evaluation unit of the Punjab State Health Services is applying the simplified system on a trial basis in one district of approximately one million population.

If the required information can be obtained within a routine administrative framework, as appears likely, it will provide a current status report of existing health needs and the manner in which members of the health team are responding to these needs. In addition, periodic updating will permit a dynamic assessment of the effects of changes brought about by realignment of responsibilities and improved methods of training and supervision.

Evaluation of Innovations

The role of the functional analysis methodology in monitoring innovative patterns of health care delivery deserves further commentary in relation to two demonstration projects that have been organized to provide service improvements.

The first, located in Punjab, India, has two components. In the first we have developed unique programs of child care and nutritional supplementation for the purpose of enhancing the nutritional status of young children, particularly during the weaning period, and for reducing their morbidity levels, particularly the incidence and severity of infectious diseases. Since it is known that poor nutritional status contributes to the risk of infection and further that infection impairs nutritional status, we have examined the impact of alternative mixes of child care and nutrition services upon this interaction. The second project component concerns the integration of maternity, child care,

and family planning services. Again there is an interaction to contend with. Parental knowledge that the health and probability of survival of their children can be improved possibly contributes to their desire for family size limitation, while child spacing can contribute to the health and welfare of the mother and children already born.

Although the need clearly exists to examine the varying degrees of effectiveness attainable from alternative service elements, this is not enough, for the resources required to achieve the desired results may exceed the capacity for routine implementation. It has been necessary to monitor the manpower and other input requirements, utilizing the work measurement and analytical approaches embodied in the functional analysis methodology.

Based upon the findings from this project appropriate job descriptions have been developed, along with corresponding training and supervisory manuals and operating procedures. Principal reliance for the basic provision of services has been assigned to a specially-trained family health worker.

The second project of interest concerns a child care program set up by the Ministry of Health in Lagos, Nigeria for children under the age of five living in a defined geographical area of the city. Initially all children visiting the clinic were seen by ministry physicians, but the volume of patients grew to the point where the limited number of physicians were unable to spend adequate time with each and alternative arrangements had to be considered. As a result several nurses were employed as nurse practitioners and half of the incoming patients were randomly allocated to these practitioners, while physicians continued to diagnose and treat the other half, along with more serious cases subsequently referred to them by the nurses.

The program has been so successful that it has received government endorsement for nationwide application in under-fives clinics. This is an important development in Nigeria, where the number of trained nurses and midwives is several times the number of physicians.

An American doctor who participated in this innovative program has since returned to the United States and has been given responsibility for the development of pediatric services in an underprivileged area of New York City. He has been able to transfer much of his Nigerian experience to his present environment, in which he has similarly focussed upon the role of the nurse practitioner.

Concluding Remarks

Over the years the author has come to hold three basic convictions, which have hopefully been documented herein: (1) the goal of access to high-quality health care as a right, rather than a privilege, is gaining universal acceptance; (2) in an effort to achieve this goal, rational health planning and innovative health practice research, utilizing the tools of management science, are receiving widespread attention and application; and (3) although problems and circumstances vary geographically and by political jurisdiction, sufficient similarity exists to permit substantial transfer of experience from less-developed to more-developed countries and vice versa.

Table 1

FRAMEWORK FOR FUNCTIONAL ANALYSIS OF HEALTH NEEDS AND SERVICES

NEEDS	FUNCTIONS	SERVICES						
		Units	Time			Personnel	Cost	
			Professional	Paramedical	Auxiliary		Other Recurring	Capital
	MEDICAL CARE (Curative)							
	PERSONAL PREVENTIVE AND MATERNITY (Maternal and Child Health)							
	FAMILY PLANNING							
	COMMUNICABLE DISEASES CONTROL							
	ENVIRONMENTAL SANITATION							

Supportive							
Travel							
Non-Productive							

Table 2

ALLOCATION OF EFFORT TO DIRECT-SERVICE AND OTHER ACTIVITIES
BY STAFF OF TWO PRIMARY HEALTH CENTERS IN PUNJAB, INDIA

<u>Activity Category</u>	<u>Percent of Effort</u>
Direct-Service	15.5
Supportive	33.3
Travel	21.3
Non-Productive	<u>29.9</u>
Total	100.0

Table 3

ALLOCATION OF DIRECT-SERVICE EFFORT AMONG FUNCTIONS
BY STAFF OF TWO PRIMARY HEALTH CENTERS IN PUNJAB, INDIA

<u>Function</u>	<u>Percent of Effort</u>
Medical Care	23
Maternal and Child Health	10
Family Planning	20
Communicable Diseases Control	46
Environmental Sanitation	<u>1</u>
Total	100

Table 4

SERVICE CONTRIBUTIONS BY STAFF CATEGORY TO VARIOUS FUNCTIONS--
 BASED UPON TWO PRIMARY HEALTH CENTERS IN PUNJAB, INDIA

Staff Category	Percentage Distribution				
	Med. Care	MCH	Fam. Plan.	CDC	Env. San.
HEALTH CENTER					
Doctor	16.0	1.0	2.6	0	0
Nurse	3.6	0.7	0.6	0	0
Pharmacist	25.2	0.2	1.4	0	0
Dresser	13.9	0	0.5	0	0
Lab. Technician	1.7	0	4.0	10.7	0
Clerk	0	0	4.4	0	0
Total Health Center	60.4	1.9	13.5	10.7	0.0
FIELD					
Doctor	0.3	0.5	0.7	0.5	0
Lady Health Visitor	3.8	16.0	12.9	0.9	0
Auxiliary Nurse-Midwife	24.1	61.4	21.8	2.0	0
Trained Local Midwife	9.8	18.6	7.4	0.2	0
Health Inspector	0.5	0.3	0.7	2.8	40.0
Block Extension Educator	0.1	0.7	13.8	0.2	5.6
Family Planning Worker	0.5	0.6	26.1	0.3	0
Basic Health Worker	0.5	0	3.1	82.4	54.4
Total Field	39.6	98.1	86.5	89.3	100.0
Grand Total	100.0	100.0	100.0	100.0	100.0

Table 5

ANALYSIS OF COMMUNITY DATA CONCERNING MORBIDITY EXPERIENCE AND UTILIZATION
OF MEDICAL CARE SERVICES--BASED UPON THREE VILLAGES IN EACH OF TWO COMMUNITY DEVELOPMENT
BLOCKS IN PUNJAB, INDIA

	Number of Cases			Rate per 1,000		
	<u>Block A</u>	<u>Block B</u>	<u>Combined</u>	<u>Block A</u>	<u>Block B</u>	<u>Combined</u>
Person-Fortnights at Risk	15,692	14,841	30,533			
Problem-Fortnights	3,882	4,478	8,360	247	302	274
Consulters - Total	748	1,314	2,062	193	293	247
Primary Health Center	119	301	420	31	67	50
Other	629	1,013	1,642	162	226	197
Health Center Cons. per 1,000 Other				189	297	256
Visits - Total	1,512	3,289	4,801	2,021	2,503	2,328
Primary Health Center	312	737	1,049	2,622	2,449	2,498
Other	1,200	2,552	3,752	1,908	2,519	2,285