METHODS OF EVALUATING HEALTH CENTRES

P. S. S. RAO, V. BENJAMIN, AND J. RICHARD

Christian Medical College, Vellore 2, N.A., South India

Health centres have been established to meet the basic health needs of communities residing in well-defined geographical areas (Dutt, 1963). Unfortunately, most health centres serve rather large populations with very meagre resources. Despite these handicaps, there is scope to improve the health services if the working of the health centres can be systematically reviewed. In most instances, however, these reviews are no better than subjective impressions gained through occasional on-site inspections, or based on a perusal of the reports submitted by the staff which emphasize mostly the fulfilment of certain assigned targets. On the other hand, if the achievements of the health centre are evaluated on a scientific basis, the planning can be more purposeful. The main difficulty seems to be a lack of evaluation techniques which could be applied within the existing framework of availability of reliable data on activity of the health centre.

While tools for evaluation are available in industry and commerce, relatively less work has been reported on suitable methods for evaluating medical care and general public health work. Attempts have been intensified in recent years to identify effective techniques for evaluating community health work (American Public Health Association, 1950; James, 1962; Brotherston, 1962; Department of Community Health Services, 1965; WHO Copenhagen, 1967 and 1968). Warren (1966) described seven areas of measurement which should be considered in the evaluation of a health service or programme, which include capacity to serve, effort expended, end-result, unmet demands and needs, adequacy, administrative efficiency, and quality. The various dimensions and difficulties in programme evaluation were thoroughly discussed at a symposium convened at Kiel by WHO (1968). Two major concepts involved in programme evaluation are (a) evaluation of adequacy of performance, defined as attainment or accomplishment in relation to the total need or demand, and (b) evaluation of efficiency, defined as the input/output ratio or the amount of output per unit of input. Practical difficulties and modifications needed in the application of proper techniques for evaluation of health centre programmes have not been reported. Some of the principles that

are necessary in such evaluations and the methods of collecting the relevant data are described and discussed in this paper, on the basis of a research project carried out from 1966 to 1969 in Tamil Nadu, South India.

MATERIAL AND METHODS

Four primary health centres in North Arcot District (Kalambur, Kommanandal, S.V. Nagaram, and Vaduganthangal) and two in Chingleput District (Avadi and Periapalayam) were included in this study along with the Rural Teaching Health Centre in Kanniambadi Block of North Arcot District.

The different methods and sources used for the collection of data and evaluation may be classified as follows:

1. interviews using specially structured proforma with health department officials, teachers of community health, and staff of primary health centres to formulate objectives and expenditures;
2. utilization of statistical and census abstracts prepared by Governmental or other agencies to determine community profiles;
3. compilation from records maintained at the health centres and reports prepared for submission to various authorities to determine performance and effort;
4. observational studies at the health centre and its peripheral clinics to determine the characteristics of patients served;
5. sample surveys involving selected respondents in the community to obtain estimates on the attitudes towards and utilization of health centre facilities and response to health programmes.

The types of data collected from the various sources and the range of time taken by any health centre are shown in Table I.

Arrangement of the programme objectives of a health centre by priorities or by order of attainment was not available. Therefore, in addition to a review of the selected literature, two methods of obtaining objectives by interview were tried:

1. DIRECT METHOD

To ask what are the goals of a health centre, the

TABLE I
DATA REQUIRED FOR EVALUATION, SOURCES, AND TIME NEEDED

Item	Method/Source				
	Interview	Census Statistical Abstract	Records/Reports	Health Centre Observation	Community Survey
Community profile		X			X
Health needs	X	X	X		X
Health demands				X	X
Current programme	X			X	
Budgeted expenses	X				
Contingencies	X		X		
Voluntary services	X		X	X	
Attendance, utilization			X	X	
Fulfillment of target			X		X
Success/accomplishment			X		X
Community response				X	
Time needed* (days)	2-3	7-10	12-14	12-14	15-21

* Team of 6 members

priorities, the vulnerable sections of the population to be served, the time period within which the goals are to be achieved, and the manner of achieving the objectives logically.

2. INDIRECT METHOD

To ask what services should be carried out, to whom, in what order, and in what manner, and then to ask why such services should be carried out so that the reasons stated can be formulated as objectives.

Subsequently, the effort put in by the health centre through its staff, establishment, clinics, and extension programmes and the performance in terms of persons receiving the services, achievement of success in prevention and cure of specific diseases, and health promotion were determined.

With prior appointments there was practically no difficulty in carrying out the interviews with the health centre officials or with the health centre staff. The records and registers maintained at the health centres were minimal and the information was limited to details on new registrations by age, sex, village of residence, and diagnosis. From the records of the maternity assistants and the lady health visitor it was possible to get estimates of the ante-natal and postnatal care given, deliveries conducted, and triple vaccination. From the drug registers maintained by the pharmacist it was possible to assess the quantity of various types of drugs dispensed and the prescription patterns. From the documents maintained by the health inspector it was possible to obtain details regarding smallpox vaccination.

The district census handbooks were used to determine the demographic and socio-economic features of the communities served. The Block Development Officer's annual report was a helpful source for some

more specific details about the people and other programmes in operation in the area. For some of the health centres it was possible to obtain reports of surveys carried out in the area, which gave further information about the people and their health problems.

In all the health centres it was possible to carry out observational studies to determine the characteristics of the outpatients attending various clinics and of persons utilizing the health centre facility. These observational studies were needed to supplement the records and were carried out on a 5% systematic random sample. Details of the survey on community response using various respondents have been described elsewhere (Sundar Rao and Richard, 1970).

FINDINGS

The indirect method of formulating objectives was found to be easier in practice. The hierarchy of objectives ranging from ultimate objective down to the lowest and most easily attainable objective was then arranged as follows:

Suppose the ultimate objective of a health centre is to provide comprehensive curative, preventive, and health promotional services to each individual residing in a defined geographical area. This ultimate objective could be attained through a few major objectives, acting concurrently or separately, each concentrating and specializing on one specific aspect of health. For example, one may state that the ultimate objective could be attained through specific objectives in the following seven major areas: (1) medical care, (2) maternal and child health care, (3) family planning, (4) control of communicable disease, (5) school health, (6) environmental sanitation, and (7) health education.

Alternatively, the ultimate objective can be

attained through successive phases—one main objective planned for each phase based on its practicability at that phase. At the end of each phase, the ultimate objective becomes nearer to attainment.

Each one of the main objectives is attained through several branches or subobjectives involving sources (place, agencies) or subgroups (mothers, children, infants, etc.) through which the main objective is approached. For example, the second main objective of providing maternal and child health care can be attained by the following objectives:

2.1 To render health services to the mothers, and

2.2 To render health services to the children.

Each one of these subobjectives is branched out further. For example, one of the further subobjectives in rendering health services to the mother could be to render postnatal care. This branch can then be further extended out as shown in Figure 1.

When subobjectives need further extension any overlapping of these tertiary objectives should be carefully avoided. It is also necessary in mapping these objectives to check whether all aspects are covered by the network of objectives.

Health centres cannot provide for all health prob-

lems at once. Nevertheless a detailed network of objectives must be prepared initially and then only those areas in which a health centre is active are considered.

Obviously the health personnel in the primary health centre area are limited and their activities are confined to certain specific areas. It was therefore convenient, for purposes of evaluating efficiency, to express the extent of effort as 'units' in relation to services carried out at the primary health centre or subcentre. The amount of effort expended on the various health programmes was expressed in terms of either health centre personnel-units per week or activity-units per week. The units of effort expended at five primary health centre areas are shown (Table II).

As expected, the main concentration of effort is at the primary health centre or in subcentre areas. In general, each health centre has a minimum of three subcentres wherein maternal and child health services were provided by the midwife and the health visitor, while a once-weekly visit was made by the doctor. Thus, in at least three of the villages relatively more health centre services are available

It is advisable to follow some numbering system such as e.g. 2 for the 2nd major objective, 2.1 and 2.2 for its immediate subobjectives, 2.11, 2.12, 2.13 for the subobjectives under 2.1, etc.

FIG. 1.—An example of branching of objectives.

TABLE II
EFFORT EXPENDED BY HEALTH CENTRES PER WEEK

Health Centre	Main Centre		Three Subcentres		Non-subcentre Area	
	Person-unit	Activity-unit (hr)	Person-unit	Activity-unit (hr)	Person-unit	Activity-unit (hr)
NA 1	66	156	54	198	6	24
NA 2	42	100	39	126	30	96
NA 3	42	96	30	81	30	114
NA 4	48	157	51	138	30	96
NA 5	36	99	24	96	33	99
CH 1	35	92	48	117	50	148
CH 2	47	182	54	132	53	149

than in other areas. However, variations were noticed between various health centres.

The population served in terms of distance from the health centre is set out in Table III.

TABLE III
PERCENT OF POPULATION SERVED BY A PRIMARY HEALTH CENTRE IN RELATION TO DISTANCE FROM CENTRE

Centre	Total Population	Population by Distance (Miles) from Primary Health Centre (% of total)		
		< 1	1-3	> 3
NA 1	58,917	11.8	18.9	69.3
NA 2	65,546	3.3	23.1	73.6
NA 3	73,250	3.9	36.7	59.4
NA 4	92,496	5.0	54.4	40.6
NA 5	105,445	8.9	5.2	85.9
CH 1	66,529	4.1	18.0	77.8
CH 2	95,067	16.6	19.7	63.7
Mean		7.6	25.1	67.2
S.D.		4.74	14.76	13.49
Range		3.3-16.6	5.2-54.4	40.6-85.6

It is observed that, in general, only the persons resident in the village in which the health centre was situated were within a mile from the health centre, which constitutes less than 10% of the total population. Another 5 to 10 villages were between one and three miles from the health centre, comprising about 25% of the total population to be served. The vast majority were more than three miles from the main centre or subcentre.

The basic demographic features of the community, such as age structure or sex ratio, and the vital events are estimated through known factors available from the census or survey data. It is thus possible to express the number of persons in these various groups or the number of vital events for any health centre area such as are shown in Table IV for one centre.

The adequacy of utilization of outpatient services by the population resident in subcentre and non-subcentre areas is shown in Table V.

The utilization varies between the subcentre areas

TABLE IV
CERTAIN DEMOGRAPHIC DETAILS AND VITAL EVENTS AT ONE HEALTH CENTRE AREA (NA 3) OF POPULATION 73,250

Group	Rate (approx.)	Estimated No.
Age (yr)		
0-4	15/100 Pop.	11,134
5-14	26/100 Pop.	18,898
15-44: Men	25/100 Pop.	18,313
Women	23/100 Pop.	16,848
45 and over: Men	5/100 Pop.	3,450
Women	6/100 Pop.	4,607
Vital Events/Year		
Births	40/1,000 Pop.	2,930
Deaths	18/1,000 Pop.	1,172
Infant deaths	100/1,000 live births	293

as well as between subcentre and non-subcentre areas. Apart from the variations in effort at the subcentre areas, the distance from the health centre also plays a part in the utilization of health services, as summarized in Table VI.

The pattern of utilization of the outpatient services by men, women, and children is summarized in Table VII.

Utilization of maternal and child health services at various subcentre areas is depicted in Table VIII.

Yearly trends of utilization are helpful in evaluating efficiency. Trends in the utilization of outpatient and maternal child health services are shown in Figures 2 and 3.

TABLE V
PERCENTAGE OF PERSONS UTILIZING OUTPATIENT SERVICES FROM SUBCENTRE AND NON-SUBCENTRE AREAS PER YEAR

Sex	Subcentre			Total	
	SC1	SC2	SC3	Subcentre	Non-subcentre
Male	8.9	1.7	2.9	3.4	0.5
Female	7.8	1.6	2.6	3.1	0.4
Total	8.4	1.6	2.7	3.2	0.4

SC 1 = closest to health centre

SC 3 = farthest, but very accessible, being on main road

TABLE VI
PERCENT UTILIZATION PER YEAR IN RELATION TO
DISTANCE FROM HEALTH CENTRE AND SUBCENTRE

Distance (miles)	New Visits %	Re-visits %
From P.H.C.		
< 1	12.7	7.8
1-3	4.5	2.8
> 3	1.2	0.7
From Subcentre		
< 1	11.7	7.1
1-3	6.0	3.7
> 3	0.4	0.2

TABLE VII
UTILIZATION OF OUTPATIENT SERVICES BY MEN,
WOMEN, AND CHILDREN
(PERCENT BASED ON NUMBER RESIDENT)

Sex	New Visits (per year)	Re-visits (per year)
Men	2.1	1.2
Women	1.9	0.9
Children	2.2	1.0

TABLE VIII
PERCENT OF MOTHERS AND PRE-SCHOOLCHILDREN
WHO MADE USE OF M.C.H. SERVICES IN SUBCENTRE AND
NON-SUBCENTRE AREAS

Area	Mothers	Children
SC 1	56.8	36.6
SC 2	21.9	16.3
SC 3	34.8	24.4
All subcentre	28.3	20.8
Non-subcentre	4.1	4.3

Some findings about awareness of, attitude towards, and use of health centre services obtained through community response surveys are summarized for subcentre and non-subcentre areas in Table IX.

FIG. 2.—Percent of new and repeat visits from subcentre and non-subcentre areas 1957-65.

FIG. 3.—Percent of mothers newly registered each year by area of residence 1957-65.

TABLE IX
COMMUNITY RESPONSE TO HEALTH CENTRE SERVICES
(PERCENT OF RESIDENTS IN VARIOUS AREAS)

Response	Health Centre Area (HC)	Subcentre Area (SC)	Non-subcentre Area (NC)
Awareness of services	94.5	98.0	96.4
Favourable attitude	84.3	86.8	65.1
Utilization of services	58.2	53.5	30.0

Variations are noticed in both awareness and attitudes, perhaps primarily related to intensity of exposure to health centre services.

Using estimates of morbidity from surveys, the extent of utilization for specific diseases is shown in Table X.

TABLE X
UTILIZATION FOR SPECIFIC DISEASES PER YEAR

Morbidity	Estimated for Area	Taken to Health Centre	
		No.	%
Infective and parasitic disease	9,921	1,218	12.3
Neoplasm	446	18	4.0
Allergic, endocrinal, metabolic, and nutritional	7,692	862	11.2
Disease of blood and blood-forming organs	1,449	310	21.4
Mental disorder	111	58	52.2
Disease of central nervous system	9,476	1,985	20.9
Disease of cardiovascular system	1,672	78	4.7
Disease of gastrointestinal system	16,166	673	4.2
Disease of respiratory system	98,445	5,225	5.3
Disease of genitourinary system	1,225	314	25.6
Disease of skin cellular tissue	9,142	1,228	13.4
Disease of bones and organs of movement	12,933	1,016	7.8
Senility and ill-defined symptoms	48,276	2,480	5.1
Accident, poisoning, and violence	9,588	1,414	14.7

DISCUSSION

One important aspect of programme evaluation consists of relating the achievements of the health centre to the total health needs in the community in order to provide an estimate of the adequacy of the performance. Morbidity and general health surveys often yield valuable data for determining the extent to which a health centre has taken care of health needs. The second important concept in evaluation is that of 'efficiency' which deals with the relationship between output and input; thus a complete and specific description of both effort and performance will assist in the study of this relationship. In this research, emphasis was placed on determining those methods that can be applied to the study of these two concepts in existing circumstances of availability of data. Further studies on efficiency can perhaps be made with data on actual costs in relation to specific services or accomplishments; these would require prospective studies to be carried out by qualified staff and sophisticated techniques of analysis, and would be expensive.

A major step in programme evaluation consists of mapping the objectives of the health centre. In many instances these objectives have yet to be crystallized. In any country, the objectives necessarily change as the country passes through various conquests of health problems and demographic transitions. However, as the minimum requirement for evaluation, the objectives must be spelt out as precisely as possible. In order to ascertain whether a predetermined programme objective has been reached or not, the success or failure of each of the subobjectives and subdivisions below this particular objective have to be determined. The criterion for success or failure at each level is based on either a comparison with some norms and standards, if available, or contrasting multiple situations.

It is not easy to find definite norms except for a few major objectives. For example, it is possible to indicate thresholds for mortality and morbidity rates or for fertility. However, there are difficulties in obtaining such standards for determining progress and accomplishment at the level of subobjectives. There is thus a need to set up multiple groups for comparison.

Two major factors found in this study which influenced the utilization of health centre services were (1) the distance of the area from the health centre or subcentre and (2) the intensity of the services provided. In order to provide an adequate basis for direct or indirect comparison of accomplishments, it is thus necessary to develop a sampling design which includes the segments of population which differ in the amount of exposure to health

centre activity. However, health is a function of many other characteristics and not just the result of a health programme alone. Political, social, and economic considerations play a large part in determining the health of any community. Consequently, when selecting different situations for comparison, an attempt must be made to avoid too many interfering variables which are likely to complicate or invalidate the inferences.

CONCLUSIONS

Programme evaluation can be carried out using different models (Schulberg and Baker, 1968), the goal attainment approach being the most popular. In general, any model would be useful to the extent that it can be applied in existing circumstances. This includes the practicability of approach, the ease with which procedures can be used in the existing health centre set-up, and the reliability of information obtained from various sources. Further, all appropriate operational definitions should be decided, whatever the programme and however elusive the actual data may be (WHO, 1968).

Even when the required data are readily available and reliable, it is necessary to observe certain basic rules in applying any method of evaluation. Such considerations become even more important when methods are being developed for use in countries where data on public health are still limited. The present study has shown that in spite of the lack of readily available and reliable data, there is a considerable amount of information from various sources that can be used in health centre evaluation. It has also shown that simple techniques can be employed to collect primary data, such as interviews, records, and observational studies at the health centre.

It is hoped that further research in this field will yield more information on other practical techniques which can be used for effective evaluation of community health work.

SUMMARY

The procedures for evaluating the adequacy of performance and efficiency of health centres are described and discussed in relation to studies carried out at seven health centres in Tamil Nadu. The manner of defining the objectives of a health centre suitable for determining the success or failure of attainment is described. In spite of prevailing conditions of availability and reliability of data, a considerable amount of information can be retrieved from several sources suggested in this paper by simple techniques of design and by interviews or observational studies. The data needed, methods

of collection, sampling design, and some analyses are outlined. Further research needed to improve techniques of evaluation is indicated.

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