

EVALUATION OF COMMUNITY HEALTH CENTRES

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CONTENTS

	Page
Preface	7
Introduction	9
1. Functional definitions of health centres	11
The historical background	12
The contemporary scene	14
Health centres in the developed countries	17
Functions of an integrated primary health centre	20
2. Past attempts to evaluate primary health centres	21
Evaluation based on the provision of resources	22
Evaluation based on the quantity of services provided and received	24
Evaluation based on the quality of services	28
Evaluation of health improvement	29
Evaluation based on costs	31
3. Proposed research	33
Objectives	33
Research design	34
Retrospective evaluation of health centres	37
References	39

PREFACE

Health centres of various types have existed for half a century or more, their common feature being the provision of health services to ambulatory patients. Little has been done so far to classify such centres or to evaluate their effectiveness in comparison with, for instance, that of a system based on the free choice of private practitioners.

This report represents an attempt to clarify the various meanings of "health centres", to review the literature on their evaluation, and to suggest ways of studying them in greater depth.

After classifying health centres according to their functions, staffing, location, and sponsorship, the report traces their history—from the ambulatory care centres that existed in Europe as far back as the seventeenth century to the modern centres now operating in both developed and developing countries.

Considerable attention is paid to past attempts at evaluation, based on such factors as costs, resources, and the quantity and quality of services. The value of operational research and utilization studies is stressed. It is pointed out that evaluation of health centres may be made with varying levels of thoroughness. At its highest level, evaluation allows the measurement of health improvement resulting from the activities of such centres.

The main objective of the further research proposed is to evaluate primary health centres as a means of improving health in the developing countries. This will require the study of practicable methods of delivering primary health care in rural areas and the staffing and policies of operation of health centres. The essential features of a basic study design are set out, together with the criteria for measuring health improvement.

The report is supported by an extensive bibliography.

INTRODUCTION

For half a century or more, health centres have been advocated, constructed, and operated as facilities for the provision of health services.⁶² The term “health centre”, however, has had many different meanings in different countries or in different contexts within the same country. In general, it has been identified with services to ambulatory persons—as distinguished from bed-patients, who are served mainly by hospitals. However, there have been wide divergencies in the purposes, functions, staffing, and administrative patterns of health centres. Moreover, relatively little has been done to evaluate the results achieved by this mechanism for delivering health services.

This report is an initial attempt to clarify the various meanings of “health centres”, to review the literature on the evaluation of their activities, and to offer suggestions for useful future studies. Specifically its purposes are:

- (1) to classify the functional definitions of health centres that are relevant to the proposed studies;
- (2) to review the literature on the evaluation of primary health centres;
- (3) to describe the evaluation methods used;
- (4) to state the objectives of the proposed studies in comparing the health centre system with other systems for the provision of primary health care; and
- (5) to suggest a protocol for the proposed studies that could be employed in different contexts, especially in developing countries.

FUNCTIONAL DEFINITIONS OF HEALTH CENTRES

Health centres may be classified according to:

- (1) functions—that is, the services they offer;
- (2) staffing, especially as regards the ratio of physicians to auxiliary personnel;
- (3) location (urban or rural area; developing or industrialized country); and
- (4) sponsorship—e.g., by public (governmental) or private agencies.

Health centres are here classified principally according to their functions. In this respect, they may be divided into 3 broad categories, each covering a number of subdivisions:

- (1) primary care centres (preventive or curative services, or both—that is, integrated services);
- (2) specialized services each directed to the treatment of a particular disease (e.g., venereal disease, tuberculosis) or population group (e.g., schoolchildren, industrial workers); and
- (3) comprehensive polyclinics in which primary care is combined with advanced or specialized medical services.

Primary care centres may be further subdivided according to whether they provide (a) preventive services only (including case-finding); (b) curative services only or mainly; or (c) integrated preventive and curative services. It must be realised, however, that in the literature and in discussions on this subject these distinctions are not always so clearly drawn. Moreover, even within one distinct category of health centre (for example, the local health centres established under the National Health Service in the United Kingdom), there may be differences in emphasis and functions, resulting in the inclusion or exclusion of certain services.

In this report, attention will be focused chiefly on primary health centres of the integrated type, which are especially relevant to the proposed studies.

THE HISTORICAL BACKGROUND

Ambulatory care centres, unrelated to hospitals and concentrating on the treatment of the indigent, were known in Europe as far back as the seventeenth century.²¹ The concept of the "primary health centre" as an establishment combining primary medical care (by general practitioners) and organized preventive services was first formulated in the report of the Consultative Council on Medical and Allied Services, held in 1920, in England, under the chairmanship of Lord Dawson of Penn.²⁴ A few years later, a similar idea was put forward by Dr Hermann Biggs, Health Commissioner of New York State,⁷³ and shortly afterwards it was again propounded in California.⁵⁵ However, owing to the rising strength of private medical practice and the political influence of the independent medical profession in those wealthy industrialized countries, none of these ideas was put into effect for many years.

Nevertheless, they spread overseas. With the support of the Rockefeller Foundation, a primary health centre—great innovation at the time—was established at Kalutara, Ceylon, in 1926.⁷⁹ The services offered by this centre were almost exclusively preventive: health examinations of mothers and babies; immunizations; environmental sanitation; health education; and midwifery services. Virtually no attention was paid to medical care, on the grounds that this was the function of outpatient departments of hospitals and that the provision of such services would so overwhelm the staff that preventive care would be neglected.¹⁷ By 1938, 10 health centres on the Kalutara model had been established in Ceylon with the assistance of the Rockefeller Foundation. Through lending its aid to health work in this way, the Foundation helped to foster a preventive approach to health services, and so to counterbalance the emphasis previously laid on hospitals and curative services in the developing countries.

In 1931, the League of Nations Health Organization held a European Conference on Rural Hygiene.⁴⁵ This conference called for the establishment of "rural health centres", which it defined as:

an institution for the promotion of the health and welfare of the people in a given (rural) area, which seeks to achieve its purpose by grouping under one roof or coordinating in some other manner, under the direction of a health officer, all the health work of that area, together with such welfare and relief organizations as may be related to the general public health work.

The heavy stress laid on preventive services in those early days is seen in the recommended functions for rural health centres, which included: maternal welfare; infant and child welfare; health education; environmental sanitation; and first aid in urgent cases. It was pointed out at the conference that local private physicians were expected to do

curative work and that only when they were totally lacking should the health centre offer medical care—presumably limited to first aid in urgent cases.

Lord Dawson's concept of integrated health centres (see page 12) was first put into practice in the USSR.⁶⁵ The socialist philosophy of that country disregarded the interests of private physicians as *entrepreneurs* and, soon after the 1918 revolution, the USSR began to construct a network of health centres offering both preventive and curative services to the entire population.²⁹ Primary health centres were part of a regionalized framework of services, with polyclinics and hospitals at the higher levels.

As health services developed further in the USSR and the supply of health manpower increased, the network of health centres providing ambulatory care became larger and more elaborate. In the cities, the principal centres for curative and preventive services came to be the polyclinics, with their wide range of specialists in addition to general physicians. For the purpose of systematic planning, standards for the staffing of polyclinics and health centres were developed by the Ministry of Health and were applied to meet local conditions in urban and rural areas.

Similar patterns have developed in the eastern European countries that have turned to socialism more recently,⁷⁷ and in Cuba after its revolution of 1959.¹³ Undoubtedly, many developing countries, especially in Asia, have looked to the USSR model in recent years for their planning of integrated health centres.

Outside the socialist countries, the concept of the integrated primary health centre began to attract widespread interest only after the Second World War. In India, the Health Survey and Planning Commission was set up in 1944, and in 1947 it issued a report advocating, *inter alia*, primary health centres for both curative and preventive services to the entire population. In 1962, the Mudaliar Report, developing the idea further, mapped out this vast country into about 5 000 "blocks" each of which (with a population of 60 000–100 000) was to be served by one primary health centre.⁷¹ The same basic idea was soon applied by several other countries in Asia and Africa, especially the former British colonies.

In Latin America, the concept of integrated services came somewhat later.⁹ The policy of the Institute of Inter-American Affairs (set up by the USA during the Second World War) had been to promote purely preventive functions in health centres, and did not switch to integration until the mid-1950s.⁵⁹ It is interesting to observe how the North American influence on the concept of the health centre as a purely preventive service affected other countries during and after the Second

World War; for example, this was the policy promoted in Greece,² and the same happened in Japan while it was occupied by American military forces.³⁹

THE CONTEMPORARY SCENE

There are still many countries in which the health centre is thought of mainly as a place where purely preventive services are provided. This is the case in the USA, where (with the exceptions noted below) health centres are usually buildings that house the local department of public health.³³ In Colombia, a manual prepared in 1959 defines the functions of a health centre as purely preventive, except that of providing for the rehydration of babies who have become severely dehydrated from diarrhoea.⁵¹ A proposal recently made in Egypt concerns only preventive services,⁸⁵ although many health centres in that country are of the integrated type.

In developing countries today, it is common for the functions of health centres in urban areas to differ from those of rural centres. In the larger cities, where hospital outpatient departments and private physicians are within close reach, the health centres—operated by the public health authorities—tend to be oriented exclusively towards preventive services. In the rural areas, where other curative resources are lacking, the integrated approach is more common.

Many developing countries are now allotting the highest priority to the establishment of integrated primary health centres on a nation-wide scale. Thus hospitals and inpatient treatment are being supplanted by health centres and outpatient treatment. This is not to say that the construction and operation of health centres now attract as much financial support as hospitals—far from it: many developing countries still spend far greater sums on hospitals than on networks of health centres. Nevertheless, health centres and other programmes of ambulatory health care are undoubtedly receiving an increasing share of attention and resources.

As a result, numerous reports and manuals defining the precise functions of health centres have been issued in recent years. As has already been mentioned, several publications laying down these functions, as well as standards for staffing and administrative procedures, have come from India.²³ One of them, published in 1966, specifies the functions of a primary health centre in the following sequence:³⁵ (1) medical care; (2) maternal and child health services; (3) school health services; (4) family planning; (5) control of communicable diseases; (6) environmental sanitation; (7) health education; and (8) vital statistics.

It is recommended that the staff to provide these services should comprise: a medical officer, a woman physician, a public health nurse,

a health educator, a statistical clerk, a clerk-stenographer, a midwife, a health inspector (sanitarian), a laboratory technician, and several family-planning field workers, with health assistants to aid the above-mentioned staff members in their duties.

A similar range of health services is proposed in a "Guide to rural health centre work", issued in 1962 by the Government of Burma.¹² The proposed staff, however, consists only of a health assistant, a female health visitor, a vaccinator, and 5 midwives. In view of the severe shortage of physicians in Burma, it is not proposed that even one should be included in the complement of these primary health centres. The "health assistant" is a male auxiliary health worker (educated to about the standard of a registered nurse) who is expected to provide all medical care as well as supervising the entire programme of a health centre. Obviously the feasibility of a programme of primary health services would depend on the type and number of workers available.

In Africa, a typical primary health centre is more frugally staffed than in India. The most exhaustive account of the functions, staffing, and recommended procedures of African health centres—based largely on the experience in Kenya and other East African countries—is given in a recent work based on a conference held at Makerere, Uganda.⁴³ In this work, the health centre is defined as "a unit providing a family with all health services it requires, except those available only in a hospital", and its staff is envisaged as consisting only of auxiliary personnel of 5 grades: (1) medical assistants; (2) enrolled nurses and graded dressers; (3) enrolled midwives; (4) assistant health visitors; and (5) assistant health inspectors and health assistants. A centre staffed in this way would be expected to serve a population of up to 20 000 with primary curative services (for common and easily treated diseases), the full range of classical preventive services, family planning, and environmental sanitation and health educational activities out in the villages, as well as to record health statistics. Difficult cases would be referred to special consultative clinics, attended periodically by a visiting physician from the regional headquarters. Within a radius of 5 miles, patients would be expected to make their own way to the centre; beyond this area, mobile clinics would be provided periodically.

In surveying the health services of Tanganyika, Professor R. M. Titmuss and his colleagues emphasize the role of primary health centres as "permanent bases from which campaigns can be launched against endemic and epidemic diseases . . . Preventive campaigns must operate through an effective chain of permanent local services which have a continuing responsibility for the treatment of reported cases, the tracing of contacts and follow-up work."⁷⁵ This survey presents a clear and useful account of the diversity of health centres existing in one African

country under 3 types of sponsorship: (a) the central government; (b) local authorities; and (c) voluntary agencies.

In Africa, primary health centres—usually staffed solely by auxiliary personnel—must be distinguished from regional health centres, which generally have physicians on their staff and 50 or more hospital beds. The combination of health centre and hospital existing in the provincial capitals of Ethiopia illustrates this pattern.⁶⁴ A more extensive introduction of such combined centres throughout Africa has recently been advocated.⁶⁷

In the Eastern Mediterranean area, health centres are envisaged as operating at 2 levels: main health centres and subcentres. In Syria, for example, a recent 5-year plan contemplates a network of main health centres, each serving 20 000–30 000 people and having a staff of 2 medical officers as well as auxiliary workers; every one of these centres would control 3 or 4 subcentres, each serving a population of about 5 000 and staffed only by auxiliary personnel.⁶ A similar concept, with a less satisfactory population coverage (each main centre having to serve some 50 000 persons), has been implemented in the Rural Health Services Scheme of Malaysia.⁴¹

In some developing countries, every health centre—whatever its level—is expected to include physicians in its staff provided that there are sufficient in relation to the size of the territory. This is the case in Israel¹¹ and also in Jamaica and Puerto Rico, where there are regionalization schemes linking health centres with hospitals.¹⁴

In the USSR, sparsely populated rural areas are served by primary health centres, each staffed with a feldsher and a midwife. Each centre is intended to serve a population of only about 300–800, and several centres operate under the direction of a rural district physician living in a larger village or town. The rural health centre, with a physician on its staff, serves from 5 000 to 7 000 people, and several such centres are linked with a rural hospital of 10–50 beds. The staff of a rural hospital typically comprises an internist, a surgeon, an obstetrician, and a paediatrician, with associated nursing and auxiliary personnel. Naturally, there are variations in local circumstances, but an essential feature of all Soviet health centres is their link with hospitals or polyclinics.^b

Another function fulfilled by primary health centres in many countries, both developing and industrialized, is the field training of physicians and other health personnel. Quite apart from their direct health

^a WHO Regional Office for the Eastern Mediterranean (1969) (unpublished document Syria/EM/RH/16).

^b Information provided by Dr A. V. Chaklin, Assistant Director for Health Services, WHO Regional Office for Europe, Copenhagen.

services, these centres—when they are fairly close to medical schools—often serve as places where medical students learn about the problems of “community medicine”. This term stresses the preventive aspect of medicine and the treatment of common ailments, rather than the management of the more severe or exotic disorders seen in hospital wards. A conference on these “teaching health centres” was held in Ankara, Turkey, in 1962.¹⁵ In an unpublished report submitted to WHO in 1963, Professor B. Kesić identified 25 countries that were then operating such centres.^a These tend to be national models providing guidance for the development of other health centres throughout the country.

HEALTH CENTRES IN THE DEVELOPED COUNTRIES

Although this report is concerned mainly with primary health centres in developing countries, certain activities of health centres in the developed countries should be mentioned. These activities reflect the universal need for primary health services and the basic parallelism of the ways in which those needs are met, even though the greater medical resources of the wealthy nations lead to different staffing patterns.

Reference has been made above (see page 12) to the proposal that the Dawson Council made in the United Kingdom in 1920. In 1935, a modification of that model—with heavy emphasis on health promotion and scant attention to the treatment of disease—was launched in the Peckham district of London under the title of “Pioneer Health Centre”. This interesting experiment, which drew worldwide attention, was interrupted in 1939 and continued after the war, from 1946 to 1950, when it was terminated.⁸¹ (There is perhaps a lesson to be learned from this ultimate failure of a health service that essentially excluded curative services and could not be incorporated into the administrative structure of the National Health Service.)

The original plan for the National Health Service in the United Kingdom provided for the construction of a network of primary health centres that would house groups of general practitioners along with the staff for the mainly preventive services of the local health authorities.⁴⁸ However, by 1958, when the National Health Service had been in existence for a decade, only a few of these centres had been built by the local authorities, and they were not very successful in attracting the participation of general practitioners.⁴ Then, in the 1960s, the idea took on new life. Groups of general practitioners had gradually been forming as private partnerships, so that these primary care physicians

^a These countries were: Afghanistan, Argentina, Cambodia, Chile, Egypt, El Salvador, Ethiopia, Finland, France, Greece, Guatemala, Haiti, Honduras, India, Israel, Kenya, Lebanon, Libya, Mexico, Pakistan, Somalia, Sudan, Turkey, Yemen, and Yugoslavia.

were becoming more accustomed to working in organized settings; in 1966 it was estimated that only about 25% of general practitioners still ran individual private practices.⁵⁰ As a result of this and other influences, local authorities found a sharply increased interest among general practitioners in having health centres in which they might rent surgery space. By 1968, 93 such centres were being operated by local authorities, 69 were under construction, and another 67 in the planning stage.²⁰ On an average, these centres contained the consulting rooms of 5.7 general practitioners each, along with various combinations of public health activities and staff (child welfare, health visitors, district nurses, etc.). In many centres, there are laboratories, X-ray equipment, and other "hospital elements"; in Scotland, 4 health centres are physically attached to small cottage hospitals (in which general practitioners may work).⁷⁴

It is evident that a type of primary health centre, providing both preventive and curative services (but not complex specialist care), is rapidly spreading throughout the United Kingdom. These centres figure prominently in the recent "green paper" on the "Future structure of the National Health Service".²⁵ Furthermore, the British Medical Association—though cautious on the question of administrative relationships between general practitioners and the local health authorities—has recently advocated that "primary physicians in the future will have to practise in larger units if they are to take full advantage of economies in the use of buildings and equipment and of close collaboration with other professions".¹⁰ Furthermore, "there is scope for substantial changes in the distribution of work amongst doctors, nurses, health visitors, social workers, and other potential team members". In Scotland, it has been advocated that one integrated primary health centre should eventually be established for every 10 000 persons.⁴⁴

These interesting developments in Europe are not confined to the United Kingdom. In France, there has been a growing tendency for private physicians to work in teams, with ancillary personnel, under one roof. These units are described as health centres (*centres de santé*), although they are not usually operated by government bodies and have a wide diversity of attributes.²⁶ Some are staffed by groups of general practitioners and the staff of others includes specialists. Some centres offer organized preventive services for mothers and children, venereal disease control, cancer detection, mental health care, dental services, etc. Their financial support comes from the reimbursement of fees by the French social security programme. The income of the centres is pooled and the staff are paid by salary. About 2 000 of these health centres are now estimated to be in operation, involving a rising proportion of the country's physicians. In 1952, about 4% of French physicians

were salaried; by 1961, this proportion had risen to 14%; and in 1970 it was estimated to be about 25%. In the last few years, however, social security payments for medical care in France have declined in relation to the general level of prices, so that the health centres are in financial difficulties.⁴⁷ Private practitioners in France cope with this problem by charging the patient a supplementary fee (above the social security reimbursement), but health centre physicians attract patients by making it known that they will not do this.

In Belgium, there are also *centres de santé*, but they are very different from those in France, being devoted exclusively to preventive health services and operated either by local units of government or by private societies. These centres began to be set up in 1948 and by 1967 their number had grown to 139, about 60% of which were operated by voluntary bodies and 40% by official bodies.⁸ This separate provision of preventive services is justified in Belgium by the alleged neglect of such services by private physicians.

In the USA, as noted earlier (see page 14), the term "health centre" has been applied mainly to the buildings that house local departments of public health. Far-sighted public health leaders envisaged health centres combining local preventive services of health departments and the offices of private general practitioners, but this idea has not taken hold.³² Instead, there has grown in the private medical sector a strong movement for "group practice", in which teams of physicians—either all specialists or specialists together with general practitioners—coordinate their services.⁴² Some of these group practices offer preventive services as well as medical care, but most of them concentrate on curative services. The most comprehensive preventive services are provided by the group practices (only about 10% of the total) that are combined with voluntary prepayment plans—e.g., the Kaiser Health Plan (with 2 000 000 members) on the west coast.

Closer in concept and aim to the health centres of the developing countries are the "neighbourhood health centres" that have been established recently in the slum districts of many large American cities.³¹ These are open only to the poor (either recipients of public assistance or the "medically indigent") and are financed almost wholly by government funds. Approximately 50 of these centres are now operating, most of them with specialists in various fields (whole-time or part-time) as well as general practitioners, nurses, laboratory technicians, community health aides (to educate the people about the use of the centre), and other personnel. An important objective of neighbourhood health centres is to provide primary health care close to where poor people live, in place of the super-specialized approach of the typical outpatient department of a large municipal hospital.⁶⁹

FUNCTIONS OF AN INTEGRATED PRIMARY HEALTH CENTRE

Returning to the main subject of this report—the primary health centre providing integrated (preventive and curative) services in developing countries—it is evident that the implementation of the concept in a country depends very much on the stage of economic development of that country. In the wealthiest industrialized countries, health centres providing both preventive and curative health services are usually well staffed with physicians (sometimes of different specialties) along with allied health workers. In countries at an intermediate level of economic development, health centres are typically staffed by at least one physician, aided by nurses and other health personnel. In the poorest, developing countries, most health centres are staffed only by auxiliary health workers; the centres may function as part of a regional network with a physician working in a larger centre at the regional headquarters, but the vast majority of patients are served both for treatment and prevention by auxiliary health workers. However, in countries at all economic levels, there is a general trend towards primary health centres with broader functions, where the patient has direct and convenient access to ambulatory services for both the prevention and the treatment of illness.^a

Thus, an integrated primary health centre may be said to provide the following basic services:

- (1) personal preventive services, such as immunizations, periodic health examinations, mass screening, and individual health counselling;
- (2) initial as well as definitive treatment of minor illnesses;
- (3) initial treatment (first aid) of major or complex illnesses, with referral of patients for definitive care to larger polyclinics or hospitals;
- (4) home visiting for either health promotion or bedside medical care; and
- (5) extramural preventive services through health education and the improvement of environmental sanitation.

Extramural preventive services may vary in extent. Most broadly, they should include what Professor Sidney L. Kark describes as “community-oriented health care”, encompassing (a) health promotion activities in the community; (b) collaboration in mass disease control campaigns; and (c) general epidemiological surveillance. The extent to which the basic services listed in the preceding paragraphs are carried out should be taken into account in the evaluation of primary health centres.

^a World Health Organization (1959) *Participation of health centres in ambulatory care* (unpublished document WHO/OMC/33).

PAST ATTEMPTS TO EVALUATE PRIMARY HEALTH CENTRES

In order to consider past efforts to evaluate community or primary health centres, it is necessary to define the term "evaluation". In this context, it means "determination of the value of a course of action". This determination can be made with varying levels of thoroughness.⁵⁸

At its most advanced level, evaluation of a health programme measures the degree to which the programme's ultimate objective—namely, the improvement of health in the population served—has been attained. There are, however, a number of intermediate stages at which measurements may be made. The levels of evaluation, in ascending order, cover:

- (1) the provision of resources (personnel, facilities, equipment, etc.);
- (2) the quantity of services provided and received;
- (3) the estimated quality of the services; and
- (4) the improvement in health resulting from the services.

Each of these 4 levels has subdivisions and a different methodology of measurement. Programme evaluation is sometimes described as the determination of a programme's *effectiveness*. The determination of a programme's *efficiency*, which requires examination of the relationship between efforts and accomplishments—or, as the systems analysts put it, between inputs and outputs—is a separate question. The simplest form of efficiency determination is the measurement of costs in terms of the cost per unit of achievement at any of the above-mentioned 4 levels of evaluation. Thus, although costs really involve a quite separate conceptual dimension, they may be considered as a fifth level of evaluation for the purposes of this report.

The following information on past attempts to evaluate primary health centres, categorized according to these 5 levels, has been gathered from the sources mentioned earlier. Some studies contain information on more than one level of evaluation, but each level will be described according to its predominant methodology.

EVALUATION BASED ON THE PROVISION OF RESOURCES

Probably the commonest type of evaluation of primary health centres has been based on a simple description of the personnel, facilities, and equipment that have been provided in an area. An enumeration of the personnel in the various categories (e.g., registered nurses, nursing assistants) usually indicates their qualifications as well. Similarly, the technical specifications of equipment, the architectural features of buildings, etc., may be described. This information alone implies that certain services are being provided and, hence, that they benefit the people to some extent.

Sometimes a report on the resources provided in a health centre will also contain data on the units of service offered during a particular year by members of the staff. This, of course, supplements the information about the work done, but it does not indicate the rate of services *received* by the people, unless the data can be related to the size of the population theoretically being served by the centre. The latter information is usually difficult to obtain, especially as many individuals may be entitled to use a facility, without actually doing so. This question of data on services provided and received will be discussed in the next section.

Studies on the resources provided in primary health centres are relatively abundant. For example, a WHO report on basic health services in Uganda provides only information on the number of health centres and other health facilities that have been established in the country, and the staffing of each centre.^a This study reveals that, in 1969, primary health services were being offered to the population by a network of health facilities constituted as follows:

hospitals	30
health centres	31
dispensaries	123
subdispensaries	107
first-aid posts	150
maternity units	7

The facilities on which the rural population mainly depends (dispensaries, subdispensaries, and first-aid posts) are without physicians, being staffed only by "medical assistants" and other auxiliaries. No information is given on the volume of services provided by these units or on the size of the population served by each.

A report on health centres in Japan gives data on the number of units of each type, and their staffing.⁴⁰ In 1952 there were 724 health

^a Kaul, P. M. (1969) *Study of basic health services in Uganda* (unpublished document WHO/CHS/70.1).

centres, divided—according to the complexity of their staffing—among type A (180 with 63 staff members each), type B (60 with 54 staff members each), and type C (484 with 37 staff members each). The report describes the functions that the centres are supposed to fulfil, which are essentially limited to preventive services. Statistics are also given on the services furnished (for example, 2 486 824 consultations for tuberculosis, 19 934 767 vaccinations) but these are not related to any population figures. It is not stated, for instance, whether the approximately 20 million vaccinations constitute a service to 20 million persons, to 5 million persons receiving an average of 4 vaccinations each, or to 2 million persons immunized against 5 diseases (each requiring an average of 2 injections). A study in one state of the USA simply catalogues the types of preventive clinic sessions (for venereal disease, child health, etc.) offered by each health centre; despite its title (“Utilization of local health centers in 25 North Carolina counties”) this study contains no data on the utilization of services.¹⁶

Numerous studies of individual health centres have been made by WHO staff members or consultants. In general, these appear to be limited to descriptions of the resources provided—often with observations on the apparent manner of work of the personnel but without any precise measurements. For example, a report on a model community health centre at Safwa (Saudi Arabia) is summarized as follows: ^a

In brief, the writer feels that the objectives of the health centre have been largely fulfilled, with the exception of sanitation. The work at the Safwa Community Centre has been organized on scientific grounds and the necessary folders, forms and registers were established. Public health consciousness was aroused and local community leaders were stimulated to organize a health committee and to nurse it in order to secure its legal recognition.

A USA Peace Corps report from Malawi is similarly lacking in quantitative data.⁵² Likewise, an article on health centres in Kenya describes the services provided and the intended functions of the centres (“preventive, curative, and promotive medicine”) but does not provide data on the quantity of these services or show how they contribute to the improvement of health.²⁷

More analytical, but still mainly within the category of evaluation based on the provision of resources, is the WHO survey of primary health centres in India, conducted in 1966.^b For this survey, questionnaires were mailed to the health authorities of all the states, each being asked to select one district (preferably one that had received

^a Zaghoul, A. Z. (1967) *Basic public health and medical care services in Saudi Arabia* (unpublished WHO document EM/PHA/119).

^b WHO Regional Office for South-East Asia (1966) *A short study of primary health centres: in-patients, bed strength, staffing and allied matters* (unpublished document SEA/PHA/56).

assistance from UNICEF) and to provide information on all the health centres in that district. Seven states responded and data were eventually gathered from 139 primary health centres. Considerable differences were found in the patterns of staffing and equipment. This study presents frequency distributions for the number of beds per centre (presumably for primary care), the number of staff in various categories, the presence of laboratories, and the distances from regional hospitals (over 10 miles in 90% of cases). Data are also given on the number of admissions to hospital beds, the number of laboratory tests performed, and the average length of bed-stay in different centres. However, since there are no data on the size of the population served, the rates of utilization (or degrees of population coverage) cannot be computed.

Whereas utilization rates are not obtainable from this type of study, the internal operational statistics give some idea of the degree to which existing resources are used. These investigations, along with "operational research" efforts, will be considered in the next section.

EVALUATION BASED ON THE QUANTITY OF SERVICES PROVIDED AND RECEIVED

The next level of evaluation reveals the volume of services emanating from the resources provided, and it includes studies of two general types: (1) operational research to quantify the output of services from an organization; and (2) utilization studies to quantify the rate at which a population receives services. Operational research studies, being much easier to carry out, have been far more numerous than utilization studies.

Operational research studies

This type of study, as applied to health centres, requires the collection of information only within the centres themselves. It is often combined with data collection on the provision of resources. Thus in the 1966 study of primary health centres in India, referred to above, information was gathered on the use of certain services. It was found, for example, that only about 1 case per 1 000 health centre attendances was referred to a hospital; that only 10% of the 139 health centres included in the sample ever received visits from a hospital consultant; and that 70% of the centres performed less than 1 laboratory test every other day. These data reflect a serious under-use of the resources available and, by implication, suggest a low utilization rate of certain services by the eligible population.

A study of a single primary health centre—at Andhra Pradesh, India—yielded more detailed data on the services given. It was found that the daily number of patients seen by each physician was so large that the average time spent on each patient could be only 2.5 minutes.^a The proportions of patients in the different diagnostic categories were as follows:

	<i>% of diagnoses</i>
diarrhoeal diseases	18.7
respiratory infections	16.1
fevers of unknown origin	10.7
skin conditions	9.6
anaemias and malnutrition	9.6
muscle and joint complaints	6.7
minor injuries	3.6
all other conditions	25.0

A similar study, made in the primary health centre of Sarojini Nagar, Lucknow, India,⁵⁶ provided frequency distributions for the ages of patients, the distances they travelled and their means of transport, the time spent per patient, etc.

A study of the patients coming to another primary health centre, at Najafgarh, also in India, gives the following data on distances travelled:³⁸

<i>Miles from the centre</i>	<i>% of patients</i>
under 1	61.8
1-2	18.4
2-3	3.4
3-4	9.5
4-5	1.5
over 5	5.0

At first glance, this tabulation would seem to indicate that, among people living more than 2 miles from the health centre, the utilization rate is very low. Whereas this may well be true, one cannot properly draw this conclusion without knowing the population statistics for areas at different distances from the health centre. Only if one assumes that about as many people live in the more distant localities as close by can one conclude that distance is an obstacle to attendance. (There may be other good reasons for reaching this conclusion, but it does not follow from the data given above.) Somewhat similar statistics on the distances travelled by patients are given in a report about the primary health centres in Uttar Pradesh.^b

^a Griffith, D. H. S. (1963) *Final report on public health programme, Andhra Pradesh, India* (unpublished WHO document SEA/PHA/30).

^b McPhail, J. E. B., Wilson, E. E. I. & Eckersley, L. W. (1963) *A study on the working of primary health centres in Uttar Pradesh, India* (unpublished WHO document SEA/RH/14).

Further studies of primary health centres in India are planned. One is to be carried out by the National Institute of Health Administration and Education (NIHAE) in New Delhi. Another will be conducted by the Johns Hopkins School of Hygiene and Public Health, under the direction of Dr Carl Taylor.^a The latter study will include household interviews on sickness in families, so that it may also provide utilization data (of the type discussed below).

Operational studies on time trends in the services provided by health centres have been made in other countries. One study in Afghanistan shows a steady rise in the volume of services furnished from 1954 to 1959, followed by a decline from 1959 to 1962.^b A study of the Rural Health Services Scheme in Malaysia also gives data on trends, showing a steady rise in the provision of ambulatory services.^c

Utilization studies

As mentioned earlier, determination of the rate of utilization of health services by a population is a more difficult research task, because it usually requires data collection from a sample of households in an area. By interrogating a sample of the population, however, data can be collected not only on the number and source of the services that they receive, but also on the occurrence of sickness among them for which medical care may not have been obtained.

Major utilization studies have been conducted in recent years or are under way. Although they are not specifically focused on the utilization of primary health centres, they are relevant from the methodological point of view. The International Comparative Study of Medical Care Utilization, directed by Professor K. L. White of Johns Hopkins University and partly supported by WHO, is an important one.³⁰ This study originally concerned the utilization of various types of health service (ambulatory care, hospitalization, provision of drugs, etc.) in somewhat similar communities of small towns in England, the USA, and Yugoslavia. Now the study has been extended to Argentina and Poland. When the data are finally analysed, they should reveal how the rate of utilization of health centres compares with that of other sources of care.

An important study on health manpower and medical education in a developing country has been carried out in Colombia.¹⁹ It involved household interviews on morbidity and on the health services received

^a Taylor, C. (1967) *Definitive project proposal: functional analysis of health center activities*, Baltimore, Johns Hopkins School of Hygiene and Public Health (unpublished document).

^b Bhatt, M. J. & Ghani, N. (1963) *Rural health project, Afghanistan* (unpublished WHO document SEA/RH/15).

^c Roemer, M. I. & Manning, O. (1969) *Assignment report, Malaysia 0035: strengthening of health services and training of health personnel* (unpublished WHO document WPR/56/69).

by a nation-wide sample of families. Data are available on the utilization of health centres, compared with that of hospital outpatient departments, private physicians, traditional healers, and other sources of care. Another well planned study is under way in a rural community of Hungary.³⁰ Apart from detailed diagnostic breakdowns for illnesses being treated or not, this gives interesting data on the sources of care for ambulatory patients. In 1964, there were 7.9 consultations per person per year, distributed as follows:

<i>Place of consultation</i>	<i>%</i>
health centre (sector team)	66.2
maternal and child health clinic	10.6
dental clinic	7.0
tuberculosis clinic	4.1
hospital polyclinic	11.2
other places	0.9

In the USA, a continuing nation-wide household survey on illness and the utilization of health services has been in progress since 1957.⁷⁶ The bulletins published on this survey show, among other things, the services given to ambulatory patients, according to the place where the services were rendered. The great majority of such services, even to the poor, are shown to be received from private physicians. A higher percentage of ambulatory services to the poor, however, is given in outpatient departments of hospitals or clinics operated by health departments than in private settings. Primary health centres are too few in the USA to be identified in these statistics. A study of one small population group (6 000) served by a "neighbourhood health centre" in Boston gives interesting information on the effect of this centre on hospital utilization; over a 3-year period (1965 to 1967) the rate of hospital admissions declined to one-third of that during the baseline period.⁷ A somewhat similar finding emerged from studying the population served by a special "community health centre" in Israel.⁴⁹

Several investigations have been made into the utilization of health centres in the socialist countries of eastern Europe. A study in the USSR, for example, revealed that approximately 29% of the adult population in a rural district visited the health centre at least once during the year for one or more reasons.³⁴ A study of surgical services in a rural health centre showed that 97.4 visits were made per 1 000 population per year (not counting surgical conditions found in preventive health examinations.⁸⁶ The planning of health manpower needs in the socialist countries is based largely on empirical studies of utilization, the demand being translated into the hours of medical time required.

In 1963, WHO initiated a study on different organizational patterns for the provision of personal health care. In this study, which is still

in progress, data are being collected on the utilization of ambulatory services in Belgium, Canada, Israel, and Yugoslavia. In each country, data are being collected on the rate at which services are used by populations in two or three different sets of circumstances. However, the characteristics of the populations (demographic, sociocultural, etc.) in the 4 countries are very different, so that any differences found in the rates of utilization of ambulatory services will not necessarily be attributable to the systems of medical care organization (despite the title of the study). This point has a bearing on any future research on primary health centres, as will be discussed below.

EVALUATION BASED ON THE QUALITY OF SERVICES

A third level of evaluation attempts to assess the *quality* of the services that are rendered. This method does not examine or quantify the total volume of services received by a population (as in utilization studies), but focuses on the nature of the services rendered. Theoretically, this type of evaluation may be based on data gathered from the health care personnel—either by actual observation or by studying the records—or on data gathered from patients.

The first of those methods has been rather highly developed in Canada, the United Kingdom, and the USA. Several investigations of British general practice, for example, were based on direct observations in the physician's surgery, performance being scored according to certain criteria.⁷² Similar studies have been made in Canada¹⁸ and the USA.⁵⁴ Quality estimates based on "medical audits"—i.e., the detailed review and scoring of patients' charts in hospitals or clinics—have also come to be quite widely applied in the USA⁴⁶—probably because the relatively loosely organized "open staff" patterns of work in hospitals favour certain compensatory processes for controlling the quality of work by individual physicians.⁶⁰

In the developing countries, however, this type of health service evaluation does not seem to have been reported. The Mexican Institute of Social Security has applied medical audit procedures in its health establishments, but the findings have evidently not been published.

Regarding the second method—the collection of data from patients—a few examples have been found. In the study at Sarojini Nagar, Lucknow, India (see page 25), after the operational research phase, interviews were held with 62 families living in the area around the health centre.⁵⁶ Of the 19 families who had visited the health centre in the previous 3 months, 78% stated that they had benefited from the treatment received. This is obviously not a profound evaluation, but it does give some indication of the quality of the treatment. A different

impression is conveyed by a recent study in Pakistan.⁵ In one province, the chairmen of 76 "union councils" (local community authorities) were interviewed about their opinions of the performance of the health personnel in their local health centres; some 86% were found to be mainly dissatisfied. Another somewhat negative picture is painted by a study of the views of health centre physicians in India: these expressed considerable dissatisfaction with their working conditions, which would seem to have a bearing on the quality of service that they can give.⁷¹

In 1951, an anthropological study was made of persons served by health centres in Brazil, Colombia, Mexico, and Peru.⁶⁶ These were centres sponsored by the Servicio Cooperativo Inter-Americano de Salud Pública, and their orientation was almost exclusively towards preventive services. Although the results of the interview were not quantified, there were clearly many causes for criticism by the people, including the lack of tact displayed by staff at the centres, the excessive time spent in waiting for service, and the fact that no treatment but only preventive services were provided for sick children.

Some of the operational research reports, such as those on laboratory tests in Indian health centres (see page 24), have obvious implications for quality assessments. Otherwise, few reports seem to exist in the literature on the evaluation of the quality of services rendered by primary health centres.

EVALUATION OF HEALTH IMPROVEMENT

At its highest level, the evaluation of health services measures the extent to which the ultimate objective of a programme—an improvement in the health of the people served—has been attained. This is doubtless the most difficult type of evaluation to make, but it is also the best: difficult, because it requires the measurement of mortality or morbidity in whole populations for long periods and with relatively elaborate data-collection procedures; best, because it can answer the question "To what degree has the objective of a health programme really been achieved?" All the other levels of evaluation, with their various implicit assumptions, are only indirect approaches to answering that question.

Since 1934, several studies—at least 5 of them of major importance—have been carried out to evaluate the improvement of health resulting from a particular programme, and some of these have touched on the methodology of evaluation. With the possible exception of an investigation carried out in Ethiopia,⁶⁸ these studies have been fairly inconclusive.

An investigation of hygienic practices, carried out in a sample of 100 families in 7 Syrian villages²² is worthy of note because its methodology of comparing the populations of test and control areas is relevant

to health status investigations, and also because it was conducted almost 40 years ago. A study was carried out in Egypt in 1952 to detect the benefits of various combinations of health services introduced into 4 villages over a period of 18 months (a fifth village had been left without services, as a control).⁷⁸ Here, the outstanding methodological feature was the selection of specific pathological conditions likely to be influenced by these services. The study included a special investigation into the extent of under-reporting of infant deaths in the 5 villages. One of the main conclusions from the study was that the only effective means of reducing infant mortality was fly control. Curiously enough, the greatest reduction in infant mortality occurred in the village that had been left without health services. Unfortunately, follow-up data on the various physical examinations and laboratory tests are not reported, except for conjunctivitis, and no further reports on this study appear to exist in the literature. In an investigation carried out in Japan from 1956 to 1960, the emphasis was laid on determining the impact of health education, though data were also collected on health improvement resulting from the activities of a health centre programme.⁵³ Despite a dramatic decrease in certain disorders—notably tuberculosis, ascariasis, and ankylostomiasis—there was no improvement in the crude death rate, cardiac death rate, infant mortality, stillbirth rate, average weight of newborn babies, or estimated nutritional status of the population. These negative findings, the absence of a control area, and a number of other factors, suggest that the health centre programme, as such, was not responsible for the improvements noted. The results of a study carried out in India in 1966 in a rural area, with time trend as the research design, are difficult to interpret because many changes occurred in the health services of the study area over the 13-year period covered (1944–1957).⁶⁴ Furthermore, as in the Japanese investigation, no control area was provided.

The most carefully designed and executed of these major trials—and consequently the most conclusive—was that undertaken in 6 Ethiopian villages from 1961 to 1967.⁶⁸ The design provided for a before-and-after study and a comparison of test and control groups. After an 18-month preparatory period during which basic data were collected in all the villages, a health centre was set up in each of 3 villages, the others being left as controls. All households were systematically sampled, every member of them being medically examined, with numerous laboratory tests. Furthermore, sociological and environmental surveys were made in each village and detailed operational research was undertaken into the activities of the 3 health centres. After the active phase of the study, lasting 3½ years, follow-up examinations were performed in all the families sampled. Among the positive findings, the most impressive

was the reduction in the infant mortality rate in the villages served by health centres, compared with the control villages. The results of this study in Ethiopia would seem to be a powerful argument for a combined curative and preventive programme in health centres, rather than a purely preventive one.

Among the minor studies of health improvement resulting from the establishment of health centres, two worth mentioning are the study that took place in the 1950s in Kenya⁵⁷ and the study of a rural health centre programme in a province of Thailand.^a A number of other investigations are now in progress or still at the planning stage, including research into the model health centres now being established in Kenya²⁸ and current WHO projects in the Republic of Korea,^b Colombia,^c and Tunisia.^d Finally, mention should be made of an evaluation study on the general health service (including family planning) in the Narangwal area of India.^e

EVALUATION BASED ON COSTS

A health service programme may be evaluated on the basis of its cost.¹ Although such an evaluation does not bring out the effectiveness of the programme, it reflects its efficiency in relation to the services that it provides.

Unfortunately, this review of the literature and other sources revealed no study specifically concerned with the costs of health centres in developing countries. However, a WHO report on health centres in Ethiopia^f states that the cost per visit to highly isolated health centres is much higher than for centres in densely populated locations (presumably because of the number of persons served): it varied between \$0.68 and \$12.07 and, in the case of maternal and child health clinics, between \$4.31 and \$10.07.¹

Studies of the cost of ambulatory services have been made in the USSR. A basic unit cost is established for a single visit to a polyclinic physician, averaging about 12 minutes. All costs of personnel and associated expenses enter into this calculation, with variations for different medical specialties.⁶¹ Other services are calculated as multiples

^a Thambiah, R. W. C. (1957) *Final report on Rural Health Unit, Chiangmai* (unpublished WHO document SEA/RH/8).

^b Ferrand, G. J. A. (1969) *Korea-0025: Field visit report* (unpublished document of the WHO Regional Office for the Western Pacific, 15 July 1969).

^c World Health Organization (1971) *Proposal for an interregional project in comprehensive health planning* (unpublished document RECS/71.7).

^d World Health Organization (1969) *Analyse économique et sociale des modèles de services de santé: étude pilote en Tunisie* (unpublished document RECS/69.1).

^e Johns Hopkins University, Department of International Health (1970) *Progress report on the population study at Narangwal, India* (unpublished document).

^f Chang, W. P. (1967) *Assignment report: Supervisory Team for Health Centres in the Empire of Ethiopia, October 1962-1969* (unpublished WHO document EM/PHA/115).

of this basic unit. A study of costs in a rural district of Romania revealed that salaries of health personnel accounted for 74.1%, drugs for 18.2%, and supplies for 3.9%.³

It is concluded, from this and other information, that the cost of health centre operations will vary directly as the salaries of the personnel, and that the maximum use of auxiliary health workers (with relatively modest salaries) will naturally cut down expenses. The fact that the services of health centres lead to a reduction in the rate of hospitalization, as has been pointed out elsewhere, also has obvious cost implications, since the care of inpatients is always more expensive than that of outpatients. However, to find out whether the more economical services provide lesser or greater benefits than those that cost more is a task requiring much further research.

PROPOSED RESEARCH

OBJECTIVES

The main objective is to evaluate primary health centres as a means of protecting and furthering health in the developing countries. This evaluation requires research into:

- (1) practicable methods of delivering primary health services in rural areas;
- (2) the staffing and policies of operation of health centres; and
- (3) the measurement of the improvement in public health resulting from the activities of these centres.

With regard to the first point, it is assumed that each of the countries in question possesses an organized framework of salaried health personnel whose services are accessible to the population. This study of primary health centres will not take into account, as possible alternatives, either a system based on the free choice of private practitioners or hospital outpatient departments: the former would not be practicable in the rural areas of developing countries; the latter are necessary in addition to primary health centres, since they provide specialist care and not the preventive and curative services that are the main purpose of these centres (see page 11).

Differences in the structure and activities of primary health centres are determined mainly by patterns of staffing and policies of operation. It is clear from the literature that there are considerable variations in the staffing of such centres in different countries. Yet there is virtually no information on the relative benefits of different combinations of staff—nor even on such fundamental questions as the comparative value of physicians and auxiliary health personnel. Therefore research should also aim to determine the value of different staffing and operational patterns. For simplicity, only those most commonly found at present are indicated here.

The measurement of health improvement—the third research goal mentioned above—is the only sure way of establishing the value of

health centres in a developing country. In evaluating an organizational pattern of medical care in London, Paris, or New York, it might be justifiable to make assumptions about the value of a "medical contact", so that the mere study of utilization rates would warrant certain conclusions. Thus it could be assumed that a high rate of medical contacts in a given population probably yields greater health benefits than a low rate. (Some scientists, of course, would question this assumption, even with regard to such highly developed cities.)

However, it would be exceedingly unsound to assume that, in a rural area of a developing country, a mere "health centre contact" or the receipt of a health service produces health improvement. This is borne out by the equivocal results of some of the studies reported above. To be certain of the benefits of a particular pattern, therefore, it is necessary to measure the ultimate improvement of health.

RESEARCH DESIGN

Several works are available on the choice of research methodologies for dealing with public health problems.⁷⁰ Programme evaluation is one type of health research, and it must be approached with the same caution as a purely theoretical problem in the biological sphere.⁸² Here only the essential features of a design for the research proposed above will be offered.

- (1) *The basic study should involve several (probably 3-5) geographical areas with populations and environments similar in all respects except for the input of primary health centre services.*

Thus, it is proposed that the basic experiment be conducted in matched geographical areas of the same country rather than in a group of countries. Use of the latter design would complicate the interpretation of the results, which might be due not to differences in the organization of the health services but to differences in the populations and the environments of the countries whose health centre patterns were being compared.

- (2) *The study should be repeated, as a whole, in 2 or 3 countries.*

So many errors are possible in scientific research, so many hidden assumptions of which the investigator may be unaware, that it is always wise to carry out additional studies to confirm or disprove an initial finding. Thus, the same basic design that is tested in one country should be tested in the others.

- (3) *The populations and areas to be compared should have clearly differentiated inputs of health centre services.*

The areas selected for study should each contain a population of between 10 000 and 20 000—small enough to show the impact of a primary health centre programme in a rural area and large enough to ensure the statistical validity of the findings. All the study areas should be approximately the same distance from a district hospital to which the primary centres could refer appropriate cases in emergencies. The study should cover at least the first 3, and preferably all 5, of the following types of area:

(a) An area with a primary health centre staffed by a physician, a team of nurses and nursing assistants, a health educator, a dispenser, a laboratory technician, a sanitarian, and clerical and other workers.

(b) An area with a primary health centre staffed only by auxiliary personnel—that is, without a physician, dispenser, or laboratory technician.

(c) An area without any primary health centre.

(d) An area similar to (a) except that the integrated programme of the centre does not include routine maternal and child health services.

(e) An area similar to (b) with elimination of routine maternal and child health services, as in (d).

The inclusion of study areas (d) and (e) would allow one of the most widespread assumptions in public health work to be tested: it would show whether the time now allotted to the examination of healthy babies—so widely assumed to be a valuable procedure—would be better spent on babies and adults with definite symptoms of sickness.⁸³

Although this research is focused on the improvement in health attributable to primary health centres, other services—especially the inpatient and outpatient care provided by the above-mentioned district hospitals—would presumably also be available to the populations of the study areas. For comparability of findings, these other services should be available to a similar extent in all the areas studied.

(4) *The criteria for measuring the improvement of health should be clearly specified and should be based on recorded data.*

These data might include the following:

(a) infant mortality rates;

(b) mortality rates in the age group 1–4 years;

(c) mortality rates in the age groups 5–19 years and 20 years and over;

(d) results of blood examinations for anaemia (haemoglobin), syphilis, and (where appropriate) malaria;

(e) results of stool examinations for ova and parasites;

- (f) results of examinations of the body surface for dermatoses or signs of other disease;
- (g) temperature readings (for fever);
- (h) results of examinations for eye disorders;
- (i) results of photofluorographic chest X-rays for tuberculosis and other chest disease; and
- (j) results of other laboratory tests or procedures, as may be appropriate in the country.

In order to collect these data, a system of registration of births and deaths, as well as facilities for carrying out the appropriate medical examinations, would be required. On the other hand, it would not be necessary to take medical histories or conduct house-to-house interviews, which anyway are notoriously unreliable in people of limited education. The mortality rates should be calculated prospectively, at the end of the first year and then annually. The remaining data should be obtained at the outset of the study, to provide a baseline, and again after a suitable interval.

It might be thought useful to measure the incidence of illness during the experimental period. To be at all reliable, this would require periodic (perhaps monthly) visits to households to determine the occurrence of illness or injury. This would be too expensive a process in relation to the data yielded. The objective indices listed above are believed to be more dependable and are less costly to obtain.

(5) *A special system for recording births and deaths must be established in the study areas.*

As severe under-reporting of vital events has been known to occur with the ordinary official systems, a special system would be necessary. A research worker, located in each of the study areas, would have to ensure that this information was collected throughout the year. All deaths should be investigated to determine the cause of death as accurately as possible (since a high proportion of those who die will not have been attended by a physician). It will be especially important to record deaths according to the place of residence rather than the place where death occurred (as is so often done in the developing countries).

It will also be advisable to have a good system of records on the services provided in each primary health centre. Several such systems have been developed.^a Although these records would not enter directly

^a Charles, E. (1962) Out-patient records and reports in primary health centres: reorganization of rural health records and reports, Lucknow, Uttar Pradesh, India (unpublished WHO document SEA/VHS/49).

into the evaluation of health improvement as it is advocated here, they will show how the services offered have been used, and this information may be taken into account in interpreting the results of the study.

- (6) *The programme should have been in operation for at least 3 years in all the study areas before the improvement of health is measured.*

One cannot hope to measure the impact of primary health centres before they have been in operation for at least 3 years, and even this period is short. Assuming that one more year would be required for collecting the baseline data and another year for the final examinations, a minimum of 5 years must be expected.

- (7) *To keep the research within budgetary limits, both baseline and follow-up data should be collected in samples of the population. However, sampling should be done among population clusters (such as villages) rather than among households within villages.*

In some of the evaluation studies mentioned above, difficulties resulted from selecting certain households within a village and omitting others. By examining whole village populations, this problem may be overcome and, moreover, logistic savings may be achieved in the performance of the necessary examinations.

- (8) *Adequate budgetary and research staff provision must be made.*

Countless research projects in public health are sterile because they attempt to answer complex questions (that is, questions with many intervening variables) with inadequate staff and in too short a time. One cannot expect the operating personnel in a programme to conduct research at the same time, although they can cooperate in data gathering.

RETROSPECTIVE EVALUATION OF HEALTH CENTRES

The evaluation of primary health centres might also be made retrospectively rather than prospectively. Thus, one might seek out in one or more countries *current* situations corresponding to the criteria indicated above in paragraph (3). The study areas would have to be essentially the same in all respects other than the structure of the health services. Furthermore, their social development should have been approximately the same during the 3 years or so preceding the start of the study.

If these criteria could be met, the data listed in paragraph (4) above could be obtained in the selected study areas during the course of 1 year. Theoretically, a comparison of these findings would provide the same answers as the **prospective design** outlined earlier. The cost would be

considerably lower but—as is well known in social research—the risk of non-comparability of the study areas would be greater.

The question posed here on the value of primary health centres—which are now advocated all over the world—would seem to be important enough to justify a sizeable investment of funds in research. If inadequate funds are invested, the entire effort may well be wasted, whereas properly designed and supported research may yield the answer to this important question.

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