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HEALTH POSTS: ARE THEY CONTRIBUTING TO BETTER HEALTH?

by

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ABSTRACT

Health posts lack the technological glamor of hospitals or the romantic appeal of village-based workers. But there are strong a priori arguments in favor of an important place for them in effective health programs. Does experience support these a priori arguments?

This examination of the experience of eight large-scale health post programs presents a mixed picture. The utilization of health posts varies widely from country to country, but health post programs are generally inexpensive enough to be affordable even when the posts are operating at significantly below capacity. Also, most people coming to health posts appear to suffer from problems amenable to effective treatment by technologies the paramedical personnel staffing the posts should be able to provide. The technologies actually provided at health posts, however, appear to be poorly suited to the problems from which the posts' patients are suffering; and they are not being well delivered.

There is obviously much room for improvement, and it is at least as important to improve the quality and relevance of the services offered by health posts as it is to extend their coverage. But even in their present, imperfect state, health post programs are quite possibly competitive with the other available modes of service delivery when compared with them in cost-effectiveness terms.

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HEALTH POSTS

I. Introduction

On the road from the hospital to the village are health posts. Going under many names -- posts, dispensaries, centers, subcenters, and others -- they are small general purpose fixed facilities, typically housed in a simple free-standing structure containing a room or two, or in some corner of a larger building. Except for an occasional maternity bed or so, they are rarely equipped for inpatient care. The paramedical workers who provide most of the services available through them normally offer simple curative care, perhaps with the support of periodic visits from a physician. This is sometimes supplemented by more specialized services, such as maternal and child health care; and/or by such outreach activities as sanitary inspections and home visits for the provision of education, services, or both.

Health posts rarely evoke enthusiasm. There is little new or exciting about them. They lack the technological sophistication of the hospital or the romantic appeal of the village. Those staffing them, while rarely enjoying more than token respect within the medical hierarchy whose bottom layer they represent, are too tightly controlled by that hierarchy to attract the interest of those favoring greater community participation in health matters. Health posts thus have few champions among those trying to find the best ways of delivering effective care in rural areas.

There are, however, several reasons for looking more seriously at the role health posts can play within systems for the
delivery of primary care:

-- *A priori* considerations suggest a potentially important place for them. There are many important technologies -- such as the provision of prescription drugs and the administration of injections -- which, on the one hand, clearly do not require the facilities of a hospital or the skills of the physician; but which, on the other, are widely considered too complicated to entrust to a poorly educated village volunteer with only a rudimentary medical background. Health posts represent an intermediate possibility which, in principle at least, seems well suited for such technologies.

-- In line with this, experience suggests that, under at least some circumstances, programs featuring health posts can work. It is of considerable interest to know whether these apparently successful experiences with health posts, which have consisted primarily of small experimental projects and programs in areas with unique social settings, represent the rule or exceptions to it when health posts are given a central role in large-scale, ongoing service efforts.

-- Regardless of how well or poorly they work, health posts are there. Millions, perhaps billions of dollars, rupees, and pesos have been invested in them over the years; and, notwithstanding their lack of glamor, millions more continue to be spent on health posts annually. Health posts thus represent the one way of bringing simple comprehensive care closer to the village with which extensive experience now exists. An assessment
of this experience constitutes an obvious and important starting point for strategic thinking about health care delivery.

For reasons like these, an examination of the record of programs featuring health posts is clearly in order. Considerations of presentational clarity and logic argue for undertaking it in three stages. First, there is need for a framework to guide the discussion. Second, it is necessary to identify health post programs well enough documented to permit an examination of them within this framework. Third comes the examination itself—an assessment of the programs identified in stage two within the framework presented in stage one, in an effort to see how well or poorly they did and to understand why they did so well or did not do better.

II. The Examination Framework

Like most development activities, health post programs have many worthwhile objectives. Such programs are to be examined here in terms of one of those objectives: the improvement of the health status of the population to be served.\(^2\)

The contribution of health posts to this objective is to be examined in terms of the amount of improvement produced per unit of input -- or, since the inputs are to be stated in financial terms, in terms of the posts' cost-effectiveness.\(^3\) The greater the amount of morbidity or mortality decline a health post program achieves per dollar expended, the more cost-effective and attractive it is to be considered.
A program's cost-effectiveness is obviously determined by two sets of factors. One consists of those affecting its cost; the other is composed of those influencing its effectiveness -- that is, the amount of health improvement it produces.

Effectiveness can best be assessed through such direct indicators as changes in mortality or morbidity rates. Information about the presence or absence of program features contributing to effectiveness is of also considerable interest, since it often permits judgments about why as well as whether a health program is effective. In addition, when direct evidence about effectiveness is lacking, as is usually the case with respect to health programs, information about the presence of such factors can be used as indirect evidence or a basis for inference.

Although the features most directly related to the effectiveness of health programs have yet to be clearly identified, it is possible to suggest, on the basis of a priori reasoning and the experience of previous health program assessments, three sets that can be plausibly associated with it. When the question of the costs incurred is added to these, the result is a list of four factors worthy of consideration in an effort to establish a health program's cost-effectiveness: the people the program serves; the approaches/technologies it offers; the competence it displays; and the costs it incurs.4/

A. The People Served

Empty health plans are of no value, regardless of how potentially effective the services available through them may
be. It is thus necessary, if not sufficient, for health posts to serve large numbers of people. Further, and equally important, the people served must be suffering from illnesses which the services available are capable of treating effectively, and who would not receive comparably effective treatment from some other source were the health posts not available.

Information about the numbers and characteristics of those served is of particular interest when compared with two other types of information:

-- The total number of people in need of the services offered. This comparison, sometimes referred to as the rate of coverage, provides a basis for estimating a program's effectiveness or overall impact on health status.

-- The number of people who could be served were the health posts in question working at full capacity. The result, often termed the rate of capacity utilization, is an indication of the posts' efficiency.

B. The Approaches and Technologies Offered

Three dimensions of the approaches and technologies offered through a health post program are of particular interest:

-- Efficacy. If a health service program is to contribute effectively to improvements in health conditions, the services offered through it must be among the technically efficacious available. There is little point, for instance, in spending a lot of time administering cholera injections if the vaccine being used is of dubious value against cholera.
-- Relevance. The technologies offered will also have to be relevant: that is, efficacious against the particular health problems affecting the communities served. The vaccination of pregnant women against tetanus, for example, has been shown to be highly efficacious against neonatal tetanus. But not much would be gained from including tetanus immunization programs among the services offered by health posts in areas where neonatal tetanus is rare.

-- Acceptability. The technologies and approaches adopted will have to be acceptable to the members of the population in need. They must, in other words, be recognized as efficacious, relevant and/or otherwise desirable by those served as well as by those offering the services. Otherwise, the health posts will stand empty and accomplish little.

C. The Competence Displayed

Potentially efficacious technologies and approaches can produce health benefits only if they are competently applied. Several types of competence are required. Three may be cited for the sake of illustration:

-- Logistical and Administrative Competence. Even the simplest technologies and approaches require that supplies and staff be available where and when they are needed. Health posts which cannot be kept staffed and supplied will not produce significant health benefits, regardless of how promising the technologies they are supposed to be delivering.

-- Technical Proficiency or Competence. The staff
concerned have got to know what they're doing: how to identify correctly what is ailing their patients and how to administer the treatments available for those ailments. This means adequate training and technical support.

--- Competence in Human Relations. This refers to the ability to gain the respect and confidence of patients through personal rapport as well as technical competence. This involves things ranging from simple courtesy — seeing that the post is actually open when it's supposed to be open, for example — to more subtle matters like an effective "bedside manner."

At the administrative level, competence in human relations involves such things as ensuring appropriate recruitment procedures, effective training and supervision programs, equitable remuneration and promotion policies, and other measures for the maintenance of staff morale.

D. The Costs Incurred

The costs incurred by a health program include expenditures for facilities and equipment; for personnel; for transport; and for supplies, especially drugs. For administrative purposes, expenses for such items are often divided into two categories: capital and recurrent. Another way of dividing costs, of greater relevance for some kinds of program assessment, is between costs which are fixed and those which vary according to the volume of services provided.

As is the case with respect to the people served, information about costs is of greatest interest when considered in
relationship to information about such other dimensions of program performance as:

-- The amount of money potentially available to support the services provided. This provides a sense of how affordable the services are.

-- The cost of similar services provided through other facilities, such as higher-level clinics or hospitals.

-- The amount of health improvement achieved.

This comparison produces the statement of cost-effectiveness, noted at the outset as being of particular interest. Of special value are comparative estimates of the cost-effectiveness of two or more different kinds of health services.

E. Relationships among the Factors

All four sets of factors just described contribute in some way or other to the cost-effectiveness and efficiency of a health post program. The contributions are not always direct, however. Often one factor will work through or interact with other factors, either instead of or in addition to exercising a direct effect. For example:

-- The number of people a health post serves would in all likelihood be strongly influenced by such things as the technologies and approaches featured and the competence with which they are offered. It would be reasonable to expect many more people to come to posts offering technologies considered desirable and providing reliable, prompt, and courteous service.

-- The costs of a health post program would
affected by the technologies it offers. Health post programs offering minor surgery will cost more than those which are limited to distributing pills.

Many additional examples could be provided and presented in the form of a set of generalized relationships or model of the determinants of health post cost-effectiveness. While this would present a more accurate sense of the complexities involved, it would be of little value in assessing the information available about health post operations. For this information is inadequate to support a discussion of anything beyond the basic relationships suggested by the simple list just presented. For this reason, more sophisticated assessments of health post performance will have to wait until much more detailed studies are available.

F. In Brief

A quick review of the factors which, on a priori grounds, seem most likely to affect the cost-effectiveness of health posts suggests four sets of questions to be asked in reviewing the information available:

-- How many and what kinds of people do health posts serve? What proportion of those in need do they reach? At what percentage of capacity are they operating?
-- What technologies and approaches are featured? How efficacious, relevant, and acceptable are they?
-- How competently are these technologies offered? Are those offering them technically qualified? How much time do they have or make available to serve patients? How well are
they provided with supplies and the other support they need?

-- How much do the services cost? How high are these costs in relation to the amount of resources available in the society, to the cost of comparable services through other facilities, and to the amount of health benefit produced?

III. The Programs Examined

A. The Selection Criteria

Finding enough material about health post operations to answer the questions just posed is not easy. The vast literature about health systems in the developing countries abounds with brief references to health posts, many of which contain pertinent bits of evidence. But, a review of the available material revealed, it is extremely difficult to draw a coherent overall picture from such bits. The review indicated that a much more promising course is to concentrate on those health post programs, limited in number though they are, which have been studied in greater depth.

Thus, in order to qualify for inclusion, a health post program had to have been the subject of providing minimally plausible responses to most of the questions presented at the close of the preceding section. It also had to meet two other criteria:

-- First, it had to be a more-or-less typical large-scale, on-going service program, rather than a closely-controlled small research or pilot project. By their nature, research and pilot projects are far more carefully documented and thus
much better suited for close examination. But they have already been closely examined, and the most important lessons from their experience have already been learned. In particular, it has been fairly well demonstrated through such projects that primary care approaches featuring health posts (among other things) are potentially capable of producing significant health benefits. As indicated at the outset, the important issue that remains unsettled and deserving of investigation is the extent to which this potential can be realized in large-scale efforts in typical developing country settings. For this, there is no way of avoiding a direct look at such efforts despite the problems of documentation it entails.

Second, it had to feature health posts staffed primarily by paramedical personnel rather than by physicians. This represents an effort to look primarily toward the less sophisticated end of the medical care spectrum, in line with the overall theme of the trilogy of studies to which the present report belongs.9/ Rightly or wrongly, physician-based treatment is widely taken to be — or at least to symbolize — a notably more advanced and expensive form of care than that which can be provided by paramedical personnel; and as such, it merits separate consideration rather than coverage as an adjunct to the simpler services that are of principal interest in the context of primary care.10/

B. The Programs Selected

The application of these criteria to the material available led to a decision to focus on eight cases, each documented by one or more field surveys. None of the surveys provides the full
much better suited for close examination. But they have already been closely examined, and the most important lessons from their experience have already been learned. In particular, it has been fairly well demonstrated through such projects that primary care approaches featuring health posts (among other things) are potentially capable of producing significant health benefits. As indicated at the outset, the important issue that remains unsettled and deserving of investigation is the extent to which this potential can be realized in large-scale efforts in typical developing country settings. For this, there is no way of avoiding a direct look at such efforts despite the problems of documentation it entails.

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B. The Programs Selected

The application of these criteria to the material available led to a decision to focus on eight cases, each documented by one or more field surveys. None of the surveys provides the full
range of information desired. None is immune from criticism, and some are seriously flawed. However, all appear to have been honest efforts undertaken with more than minimal care; and each deals with an ongoing program which covers at least several hundred thousand people.  

The eight cases are:

- Botswana, government health clinics. These are small buildings permanently staffed by three or so nurses, midwives and assistants. They might have an observation bed and up to six maternity beds, but they are not otherwise equipped for inpatient care. They and the health posts below them (which are not permanently staffed but are instead are visited regularly by para-medical teams) constitute principal units providing preventive and curative services for the country's rural population. In the mid-1970s, there were forty-five health clinics in the country, whose population was then around 700,000; the plan was to have ninety health clinics in operation before the end of the decade. The principal source of information about the clinics is a 1977 study of four of them undertaken by Oscar Gish and Godfrey Walker as part of a large study whose primary emphasis was on a comparison of the cost-effectiveness of fixed and mobile facilities.  

- Brazil, health posts of the Fundacao Servicos de Saude Publica (FSESP, Foundation for Public Health Services). FSESP, a public foundation supported by the federal government and linked to the federal health ministry, provides essential sanitation and primary care services in areas of special economic
importance, such as agricultural colonization or industrial development projects. It operates in sixteen states and two federal districts, extending coverage to areas the state health secretariats have been unable to reach, especially in the poor states of Brazil's northern and northeastern regions. Among other things, the FSESP operates around 300 health posts, each serving a population of ranging from a few hundred up to 11-12,000. Each post is staffed with a full time visitadora sanitaria, or community health visitor, and a sanitation auxiliary. It is visited by a physician on the average of once a week. The post's personnel provide a range of curative and preventive services delivered both through clinic sessions and through home visits. Information about the program is available from a just-completed, still-unpublished study prepared for the Primary Health Care Operations Research (PRICOR) project of the U. S. Agency for International Development by a team from the Johns Hopkins University School of Hygiene and Public Health.13

--- Ghana, government health centers and posts.

To judge from the limited information available, there appear to be somewhere on the order of two hundred health centers and posts in Ghana, each staffed by three to ten paramedical personnel. They provide a variety of ambulatory care and preventive services within the center or post itself and in the community. Detailed information about the operation of the five health centers and three health posts located in two districts with a total population of just under 400,000 appears in a 1976 study of the overall health delivery system in those districts undertaken by the Health
Group of the Sussex University Institute of Development Studies.

--- Indonesia, government subcenters and health posts. Subcenters are small satellite clinics, usually located along a paved road or near a village market, staffed by between one and four paramedical personnel, at least some of whom live there. Posts are smaller units, usually a single room in a village house, visited one or two days a week by paramedical personnel from a central health center. Subcenters provide varying combinations of illness care, maternal and child health services, and family planning assistance. Personnel from the subcenters and posts also participate in other health programs in nearby villages, such as immunization and sanitation campaigns. In the early 1980s, there were just over 10,000 subcenters and posts in Indonesia. Information about their operation comes from a survey of twenty-five to thirty of them in an area of Central Java covering a total population of about 1,000,000; and an in-depth study of five subcenters and posts and of the people served by them in two subdistricts of the same area, with a total population of 100,000. Both were done between 1981 and 1983 by Peter Berman for his doctoral dissertation prepared for Cornell University.

--- Nepal, government health posts. One of Nepal's 550 health posts is typically staffed by one or two paramedical health workers and a larger number of village health workers and supporting staff members. The paramedical workers are expected to handle a wide range of health matters: providing injections, offering maternal and child health services, giving emergency
care, and other assistance as needed. The village health workers provide health education and record vital statistics through home visits. The principal source of quantitative data is a 1977 study of six health posts and the people served by it in Tanahu District, with a population of 158,000, prepared by the Tribhuvan University Institute of Medicine. Qualitative data about the health posts' operations in several parts of the country are available from articles by anthropologist Judith Justice.16/

-- Swaziland, rural clinics participating in the government's Clinic Pilot Project. Since 1980, the government has reorganized the functioning of some fifteen to twenty of its rural clinics to provide a central role for a new cadre of nurse practitioners. The information available about the clinics' operation is from interviews with and performance assessments of seventeen nurse practitioners working in these clinics, undertaken by the Swaziland Institute of Health Sciences. (Since the principal objective of the report was an assessment of the nurse practitioners' training and clinical skills, the amount of information provided on the clinics' overall operation is considerably more limited than that available for the other programs discussed.)17/

-- Tanzania, government rural dispensaries. Like their counterparts elsewhere, they are small one- or two-room structures staffed by an average of two paramedical staff members and one supporting worker. Their duties appear to consist primarily of the provision of curative care. In the late 1970s, there were about 1,700 such dispensaries serving Tanzania's rural population
of 15,000,000. The principal source of information about them is a comprehensive 1979 health ministry evaluation of the health sector which provides data from a variety of sources.18/

— Thailand, government subdistrict health centers. In 1977, there were about 3,300 subdistrict health centers in Thailand, each serving a population of 5-10,000. The typical center was staffed by a midwife and a sanitarian/health worker. Their duties were to provide simple curative care, maternal and child health services, family planning advice and services; and to encourage better sanitation and environmental health practices. Information about the centers' operation is available from two studies of the health system. One is a 1975 survey whose coverage included thirty-four centers in Lampang Province. It was executed under the auspices of the department of public health prior to the initiation of a service improvement project. The second is a 1977 report on health service utilization in Suphanburi Province by the Institute for Population and Social Research of Mahidol University, which covered around fifty subcenters.19/

IV. The Examination

Direct estimates of effectiveness are not available for any of the eight programs just noted. There are not, for example, the before-and-after mortality rates or comparisons of death rates in program and control areas often found in research projects.20/ As a result, an estimate of the programs' performance and cost-effectiveness must be based on inferences drawn from what is known
about the four components of cost-effectiveness discussed in presenting the framework: the people served, the approaches and technologies offered, the competence displayed, and the costs incurred.

A. The People Served

The information provided about the people served is usually expressed in terms of the numbers and characteristics of patients contacted in the post. The concept of a patient contact, which can refer to anything from a piece of advice proferred casually in passing to several hours spent on a complicated delivery, is ambiguous; and this ambiguity complicates comparisons among facilities and programs, since the content of a patient contact could well vary greatly from one to another. Also, the emphasis on contacts in the clinic understates the posts' true contribution, since the frequently extensive activities of its staff in the community are captured inadequately if at all. In addition, there are the usual problems of data reliability.21/

All this means that confidence in conclusions based on the information available must be as limited as most conclusions about social phenomena in the Third World. But if care is taken not to press it too hard, the information is adequate to produce interesting and perhaps even useful suggestions about coverage, utilization, and the characteristics of those served.

1. Coverage

Table 1 provides coverage estimates for the eight programs reviewed. Of particular interest are the figures of the right-hand column, which refer to the average number of annual contacts
per member of the target population.

Because of differences in the way in which the target populations are defined, caution must be exercised in comparing those figures directly with one another.

Even so, it seems legitimate to conclude from them and the other pertinent information provided that the coverage of the health post programs covered is rarely if ever great enough to exercise a significant impact on overall health status.

There are two reasons for this conclusion. The first is that overall coverage rates are almost invariably low. The second is such coverage as exists is very poorly distributed among members of the population.

With respect to the first of these points, the figures of table 1 suggest that the average member of the target population comes in contact with a health post as frequently as once a year in no more than one or two of the programs covered. Only the programs of Botswana and Tanzania are shown as having coverage rates greater than this; and it is possible that, had the target population in Botswana been defined in a manner similar to that in other programs, the coverage rate there would also be lower than one. In one-half the programs, the average number of annual visits to a health post is reported to be below 0.5.

The evidence on the distribution of coverage is less comprehensive than that on average coverage rates; but such evidence as exists indicates that the uneven coverage typical of rural health services in the Third World is characteristics of the pro-
programs reviewed here. One dimension of this is the tendency of coverage to be much higher than average among people living near the post, much lower than average among people living further away. In Botswana, for instance, people living within five miles of a post used it twice as frequently as people living five to ten miles away, four times as frequently as people living over ten miles away. In Brazil, most services appear to have been provided to the 10 percent or so of the population living closest to the post. A second dimension of uneven coverage appears in the very large differences reported by posts within the same system. In Botswana, the coverage of the most effective health clinic was four times that of the least effective; in Swaziland, the difference between the most and least effective appears to have been on the order of eight times; in Indonesia, it was ten times; there appear to have been wide state-to-state variations in coverage by FSESP programs in Brazil.

Figures such as these suggest that, while some members of the population may be gaining frequent access to health posts, most are receiving little if any service. So long as this is the case, it is difficult to see how they can be having much of an impact on overall health status, regardless of how beneficial their services may be to those receiving enough of them.

2. Utilization

The fact that health post are not affecting health status because of their low coverage is not necessarily a reflection on their value or potential. It could indicate simply that, while
those health posts which exist are performing well, there are not enough of them to make a difference.

For this reason, it is important to look beyond coverage and determine whether such health posts as exist, however few they may be, are performing well enough to make an increase their number desirable. For this, it is necessary to see how many people are being served, with what results, by the posts presently in operation.

The figures of table 2, which deal with utilization, represent a first step in this direction. They indicate the number of patient contacts per day per facility in each of the eight programs covered. As can be seen, they have been prepared from annual figures on the basis of the assumption that each post operates 250 days per year -- a figure representing the approximate number of days of service provided each year if the posts are open five days a week except for holidays. They have also been crudely adjusted for differences in facility size.

The figures indicate that the number of patients served daily varies widely. The range is from under six per day in Suphanburi, Thailand to over 100 per day in Tanzania. The variation appears to have a distinct geographic pattern:

The utilization of health posts is particularly heavy in Africa. If forty to fifty patients per day is taken as an approximation of the maximum number served in a small post without a significant diminution in service quality, overutilization seems the norm. Only in Botswana is the average daily
health post attendance below forty. In Ghana, Swaziland, and Tanzania, it is over sixty-five. As noted earlier, health posts in Tanzania report contacting over 100 patients daily -- suggesting only about two minutes available for each patient contact.

-- Underutilization appears more common in Asia, where clinic attendance is notably lower than in Africa. The number of daily contacts in Nepal, Indonesia, and Thailand is below thirty. Evidence of underutilization is particularly clear for Thailand. There, health posts have lost out in the competition with the higher-level facilities in the health system or, more importantly, with an extensive network of private pharmacies for an adequate share of the health care market.

-- The situation in Latin America is not clear. Information is available for only one program there -- the FSESP program in Brazil -- and it is difficult to know how typical that is. Also, although the utilization rate of that program is low, at least compared with Africa, a review of the material presented about it suggests that the pattern of services it provides is significantly different from that of the other programs reviewed, and that a lower capacity figure than that suggested earlier might be more relevant for it.

When differences within programs are taken into account, the range of experience becomes even greater. As has been seen, there appear to be wide variations within programs, suggesting that most programs have at least some facilities that are underutilized and some that are overutilized, whatever the overall
average might be.

3. Characteristics

As indicated earlier, optimal health post performance requires that a significant proportion of the patients served by them suffer from potentially significant ailments which can be treated effectively by the simple technologies the posts can offer. The information available for the programs covered suggests that at least a significant minority, and probably a substantial majority of the patients contacted by most health posts suffer from such problems.

The evidence in support of this view is of three types. The first consists of general indications that most people served by health posts are quite poor and thus particularly likely to suffer from problems especially prevalent among the poor which simple technologies can handle. The second is a set of suggestions that, in many cases, a significant portion of health posts' patient contacts are for maternal and child health or family planning, for which simple and potentially efficacious technologies are available. Third, a majority of the people coming to health posts for general outpatient services appear to be seeking assistance for problems with which simple technologies can deal.

With respect to the first of these three points, there are two reasons for suspecting that most of those who use health posts are quite poor. One is that health posts are typically located in very poor areas. There are not, for example, many wealthy people living close to the isolated health posts found
in the mountains of Nepal or in the bush of Tanzania; in Brazil, as noted, the FSESP health posts studied are concentrated in the country's North and Northeastern states known for the persistence of poverty despite the wealth found elsewhere in the country. Second, the one study known to have looked specifically at the relationship between income and service use, in Indonesia, found a clear tendency for lower income people to use subcenters and posts more frequently than more sophisticated centers or private facilities.37/ Any assessment of the situation elsewhere can be based only on speculation; but it stands to reason that the pattern found in Indonesia holds true more generally: as will be seen, health posts hardly provide luxury care that would appeal to those who can afford to go elsewhere.

The second of the three points mentioned above -- about the volume of maternal/child health and family planning services provided -- is addressed by the figures of table 3. These indicate the division of total patient contacts (or, in one case, the allocation of staff time) between general outpatient and maternal and child health and family planning services, for each of the four programs whose reports provide that information: Botswana, Ghana, Indonesia, and Thailand. As can be seen, maternal and child health and family planning contacts represent at least 20 percent of the total volume of services provided in each case; in Indonesia and Thailand, they approach or equal 50 percent of the total.

Maternal and child health services, especially the latter, deal primarily with groups suffering from particularly high mcr-
bidity and mortality rates, frequently produced by problems generally believed easier to deal with than the afflictions encountered at older ages. Also, there exist relatively inexpensive and efficacious child health and contraceptive technologies suitable for distribution through health posts: oral rehydration, antibiotics, and immunizations for child health; intrauterine devices, oral contraceptives, condoms, and others for family planning.

Further, turning to the third of the three points mentioned at the outset, a significant proportion of those appearing at health posts' general clinic outpatient sessions also appear to suffer from illnesses that should be treatable by services the posts can offer. This can be seen from the figures of table 4, which indicate the three leading complaints of outpatients attending the general sessions of health posts in Botswana, Nepal, Swaziland, and Tanzania. The figures indicate that at least 40-50 percent or so, if not more, of those appearing in these four programs should be helped at least somewhat through such things as simple antibiotic therapy (for respiratory and urinary infections, and for venereal disease), oral rehydration (for diarrhea and dysentery), and antihelminthic and antimalarial agents (for gastrointestinal parasites and for malaria, respectively).

From Botswana and Nepal comes the further suggestion that a significant proportion of those ailments constituting the "residual" -- that variety of illnesses constituting the 40-60 percent of the total not covered by the "big three" noted on table 4 -- might also be amenable to treatment through simple remedies.
The conditions from which the clinic outpatients in Botswana suffered were divided into four categories: for three, the authors believed that efficacious treatment could be provided in one or a series of visits; for the fourth, only palliative treatment was possible. About 91 percent of all contacts fell into one of the three treatable categories; those ailments for which only palliative treatment was available constituted around 9 percent of the total. When a similar approach was applied in Nepal, about 75 percent of those coming for services were judged to be in need of them.

B. The Approaches and Technologies Offered

To say that simple, efficacious technologies exist for people served by health posts is not the same thing as saying that those technologies are actually offered. What technologies do health posts in fact offer, and how efficacious are they?

The information provided is too limited for a thorough review; but what exists suggests a very mixed, often clearly suboptimal situation. That, at least, is the impression emerging from a look at the three issues touched upon by the evidence from the programs under review: the degree to which the paramedical personnel staffing health posts are given and exercise the authority to prescribe and administer controlled drugs and procedures; the content and likely efficacy of the maternal and child health services provided; and the proportion of total effort expended on preventive relative to curative measures.

The first of these questions can be made concrete by posing
it with respect to a set of specific drugs and procedures. Are health post personnel, for example, authorized to prescribe and distribute antibiotics? Can and do they on their own authority provide antibiotics and antimalarials by injection as well as orally? With respect to family planning, can and do they insert intrauterine devices and prescribe oral contraceptives; or are they limited to providing advice and distributing over-the-counter contraceptive methods like condoms and spermacides?

The scraps of available evidence, which speak only to the administration of drugs and not to family planning methods, come from Ghana, Indonesia, Swaziland, and Thailand. In Ghana, it seems quite clear that the health post staff frequently administer antibiotics orally and by injections; and that they also provide antimalarial injections. In Swaziland, health post nurse practitioners appear to provide antibiotic and vitamin injections on their own authority as matter of course. The workers in Indonesia's subcenters also prescribe antibiotics and give injections. The Thai experience seems quite different. The several references in the Suphanburi study to the inability of health post personnel to administer "strong" drugs readily available through druggists suggests much more severe restraints on paramedical personnel than in Ghana, Indonesia, or Swaziland.

The second question, concerning maternal and child health services, can be addressed in two stages. The first is to look at what is frequently considered an optimal pattern for such services, on the assumption that some variation of this represents
what is offered in most health posts. The second stage is to look about for such evidence as exists concerning that pattern's efficacy as a basis for inferring the likely potential efficacy of health post activities based on it.

A useful statement of contemporary thinking about an optimal service pattern is to be found in the criteria by which the health posts' maternal and child health services were assessed in Ghana. These criteria covered fifteen items with respect to child care (such as the accurate weighing of children, the administration of malaria prophylaxis, and the provision of advice about weaning) and twelve items about maternal care (such as the identification of problems in previous pregnancies, the provision of adequate health education, the discussion of family planning). The more of these items adequately covered, the better the service was judged to be.

Thus far, there has been only one major rigorous test of a package of this sort. That was a project in Bohol Province of the Philippines where, during the late 1970s, an intensive effort was made to serve a population of about 400,000 with a set of maternal and child health (and family planning) activities roughly similar to those on the Ghana list. The project brought about a notable increase in the coverage of the services offered; and there was a marked decline in fertility. But, concluded those associated with the project on the basis of their vital statistics surveys, it did not produce any reduction in infant or child mortality. Several reasons were suggested for this. The first
was that the technologies employed had not been relevant to the health problems that existed. A major emphasis had been placed on maternal immunizations against neonatal tetanus, for example, and deaths from neonatal tetanus had been reduced sharply; but neonatal tetanus turned out to be responsible for only a very small proportion of all deaths. The second was that many of the technologies employed were not efficacious, and that the package of services did not include some that were: the project midwives had not been allowed to administer antibiotics, for example.47/ The experience of a single project does not suffice for a definitive judgement, of course. But at the same time, it is surprising that there was not at least some change in Bohol's infant mortality rate if the standard package of maternal and child health services is as efficacious as it is normally taken to be. In the absence of countervailing examples where such a package has been shown to produce marked improvements, the Bohol experience seems at least adequate to raise questions -- and perhaps to justify a degree of skepticism -- about whether general maternal and child health services often featured at health posts are nearly as efficacious as typically assumed.

In addressing the third issue -- that is, the balance between curative and preventive services -- the (again limited) information available produces a strong suspicion that the frequently-noted emphasis on curative at the expense of preventive services represents less of a problem than the limited efficacy of many of the particular preventive services featured. For while an
overall assessment is difficult, it seems clear that at least some of the preventive approaches applied at health posts are notably less efficacious than many of the curative measures used.

Curative approaches like antibiotic therapy for the treatment of respiratory infections as used in Ghana and Swaziland have been shown to be efficacious, for example; while it is extremely difficult to see how much could ever come of preventive approaches like the efforts of Ghana's health inspectors to change peoples' behavior with respect to water use and defecation.

For whatever reason, people in rural Ghana seem to like to defecate as they are now defecating; and one suspects after reading the available reports that it's going take a lot more than the best health education has to offer to get them to change their ways.

This should not be taken to indicate that curative care is inherently or inevitably superior to preventive measures, of course. Many preventive approaches -- such as immunizations -- are clearly efficacious. But there are efficacious and inefficacious approaches and technologies on both sides of the preventive-curative divide, with enough efficacious curative and enough inefficacious preventive ones to justify arguing that preventive approaches in primary care do not deserve the assumption of innate superiority they frequently enjoy -- and to suggest that much of the energy now spent lamenting the lack of attention to preventive measures might better be allocated to the development of more efficacious ones.

All in all, with respect to the technologies and approaches
used, such evidence as exists provides grounds for no more than limited encouragement. Health posts, especially in Africa, appear to have access to at least some efficacious technologies; the extent to which they do in Asia or Latin America is less clear. In both Africa and Asia, health posts seem to be devoting a significant proportion of their efforts to the delivery of a package of maternal and child health services whose overall therapeutic efficacy is at best unproven. Although the charge of a primary emphasis on curative rather than preventive medicine often levelled against health posts is perhaps accurate, this seems less striking than the low efficacy of some of the preventive activities featured.

C. The Competence Demonstrated

Even the potentially most efficacious approach or technology can be rendered ineffectual if it is not competently delivered. How competent are health posts in delivering the technologies they offer?

The material reviewed provides two or three reports on each of four aspects of program competence: the technical capability displayed by those who examine patients; the availability of drugs and equipment; the amount of time devoted to each patient seen; and the time pattern of daily patient flows through the posts. As was the case with the technologies and approaches featured, the overall impression emerging from these reports on competence is no more than minimally reassuring.

With respect to the first of these four aspects, there was an explicit attempt to assess the technical capability of
those providing services in three of the eight programs covered. The assessments were made by observing the health post personnel in action and scoring them against some standard which the scorer, a qualified clinician, considered appropriate.

In two of the three cases, the overall judgement was basically favorable. Nurse practitioners in Swaziland were found to provide valid diagnoses in almost 90 percent of the 200-plus cases observed; misdiagnoses with possible serious consequences for the patient were noted in about 3 percent of cases. Almost 90 percent of patients were also correctly treated: 9 percent were overtreated, 3 percent were undertreated. In Tanzania, 87 percent of diagnoses and 90 percent of treatments were judged to be correct or almost correct -- proportions lower than those at hospitals but higher than at the larger rural health centers.

In Ghana, the reviewers were less well satisfied. Using a scoring system developed from lists of items like those described earlier with respect to maternal and child health, they gave the average health post a score of about twenty-one out of a possible thirty-four for general outpatient services, eleven out of twenty-eight for child care, and ten out of eighteen for antenatal care. In each case, this average score was considered "fair." In both Ghana and Swaziland, a tendency toward overdosing was noted. In each case, there was an inclination to prescribe drugs when they were not needed, to prescribe a larger number of drugs than required, and to use injections when orally administered drugs would have been sufficient. The reason appears to
have been as much patient demand as much as practitioner ineptitude: patients were said to want and expect medication, especially injections, and to be dissatisfied unless they received them.\textsuperscript{52} In Tanzania, some 70 percent of patients coming to health posts said they expected and wanted an injection.\textsuperscript{53}

Information about the second of the four aspects of program competence covered -- on drugs and equipment availability -- is provided only in reports on Ghana, Indonesia, and Tanzania. In Ghana, the pattern was mixed, with inexpensive essential drugs frequently in short supply while more sophisticated preparations were much more likely to be available.\textsuperscript{54} In Tanzania, the question was addressed by checking to see how many of nine essential drugs were present in the health posts examined. Five or more of them were found in 75-80 percent of the posts. Valium and mexaform, which were covered separately, were found in 23 percent and 15 percent of the posts, respectively. About 40 percent of the posts had an adequate supply of drugs. About half the posts had a set of scales for weighing children in operating condition; around 40 percent had a working refrigerator for vaccines.\textsuperscript{55} A passing reference in the Indonesia report refers to an apparently adequate supply of drugs in the subcenters there.\textsuperscript{56}

An indication about the third area of program competence -- the average amount of time devoted to each patient seen in the health post -- is available for four programs. In Brazil, the median time per consultation in the post ranged from twelve to eighteen minutes, depending upon the health problem being treat-
ed.57/ Everywhere else, the average was much less: from three to five minutes, including record-keeping and medical advice, in Ghana;58/ two to four minutes in Nepal;59/ on the order of two minutes in Tanzania, with only 3 percent of patients receiving five minutes or more.60/ Only in Brazil, in other words, did the average health post patient have as much as five minutes per visit with the primary provider of care.

All three programs with available information about patient flow, the fourth aspect of program competence covered, appear to have operated according to a similar rhythm. Patient visits were not regularly spaced through the day. Rather, the day typically began with a mass of early-arriving patients awaiting treatment; patients passed quickly through the post at two-, three-, or five-minute intervals; and the post was then vacant and its staff idle from the late morning or early afternoon onward.

In Indonesia, "visits to rural clinics usually show the staff busy with patients in the early hours of the working day and the clinic virtually empty after 10:30 or 11:00 A.M."61/ "After 2 P.M.," in Ghana, "there was very little activity in almost all health units..."62/ Two-thirds of all patients at Tanzania's posts arrived by 9:00 A.M.; over 80% had been treated before 1:00 P.M.63/

This pattern, well known to visitors to clinics in other parts of the developing world as well, indicates a clearly suboptimal use of time.64/ Because of it, there was much more time available for patient care than actually used for that purpose -- appar-
ently regardless of how many or few patients were seen. The particular brevity of the average examination time in Tanzania, for instance, is not a reflection simply of the fact that so many people are treated: each consultation could have been around twice as long as it actually was had the consultations been spread over the full amount of time available instead of being squeezed into the pre-luncheon hours. Conversely, programs with relatively light patient loads do not seem to use the extra time available to extend the lengths of the consultations offered. The principal effect of the additional time, rather, appears to be to allow the post to close earlier. In the posts of Indonesia, where the daily patient load is only around one-fifth that of Tanzania, people seem to be rushed through much as they are everywhere else. A similar situation is reported in Nepal. There, as noted earlier, the average consultation lasted only around two to four minutes -- even though observations of health post personnel indicated that they were spending from one-third to one-half or more of their time waiting for patients.65/

All in all, despite its fragmentary nature, the information presented about these four aspects of program competence fits together into a fairly coherent picture. To the degree the limited range of experience reported here can be considered typical, patients arrive in the early morning; wait for some time; then spend three or four minutes with a paramedical clinician who is in that period of time usually able to arrive at a fairly accurate sense of what ails them and to provide (or, if supplies are low, at
least to recommend) medication which, if not always the best, is at least generally relevant to their immediate problems.

The simple, routine dispensary function, in other words, seems to be more or less adequately fulfilled, at least when the necessary personnel, drugs and supplies are available. But the brevity of the average consultation and the way in which patients are herded through suggest that there is little service beyond this -- that in particular, there is little if any education provided or information transmitted of the sort necessary to produce more than minimal patient understanding or behavioral change.

D. The Costs Incurred

From what has been said so far, most of the people visiting health posts would seem to receive services of at least some, if possibly limited value. Are the costs of health posts low enough to make services of this value an attractive buy?

As indicated in the framework presented earlier, this question can usefully be looked at in three ways. The cost of services offered through a health post can be compared: with the overall volume of resources available in the society, in order to get a sense of its affordability; with the cost of similar services offered through other facilities, to see which is cheapest; and with the amount of health improvement produced, especially relative to other approaches.

The figures of table 5, which cover seven of the eight programs reviewed, deal with the first of these three comparisons. They refer to the relationship between the expense of a health
post program and the resources potentially available to support it. The comparisons are expressed in terms of the cost of ten patient contacts as a percentage of the per capita annual gross national product. This is intended to approximate the percentage of society's income that would be required for a volume of health post services great enough to make a significant improvement in the health status of its population.66/

With the notable (and inexplicable) exception of Botswana, all of the estimates presented in the right-hand column of table 5 fall in the range of 1 to 3 percent. Such uniformity suggests this range as a rule of thumb for estimating the cost of improving health conditions noticeably through a health post program.

Or, perhaps more accurately, as the upper end of the range. For there are two reasons for arguing that the figures of table 5 are at least somewhat inflated. One is that some are likely to think that the figure of ten visits per capita used in their derivation is too high. To the extent this is so, then the true cost of improving health status through a health post program will be correspondingly lower. Second, the figures of table 5 are based on the assumption that the degree of capacity utilization does not change as services are expanded 10-20-fold or so, as required to achieve the levels of coverage implied by them. As has been seen, there is a considerable degree of underutilization in some of the programs covered; and, as will shortly be pointed out, an increase in the utilization rate could produce a significant reduction in the cost of a patient contact. Were an expansion
of services to be accomplished in part through an increase in utilization, the cost per patient contact would fall, and the overall cost would be correspondingly less than indicated.

The second comparison -- the cost per patient contact for similar services provided through different kinds of facilities -- is the subject of table 6. It presents the cost per patient contact (per outpatient contact in the case of hospitals) for services provided through different kinds of facilities.

These comparisons suffer from more than the usual number of ambiguities. For one thing, the greater the difference among facilities, the less certain one can be that the content of a patient contact is the same, or that the services provided are really similar. Second, and closely related, is the fact that the average cost of a patient contact is strongly affected by the mix of services provided, requiring a difficult prior determination of the service mix to be used as a basis for comparisons. Further, the high ratio of fixed to variable costs in the programs reviewed, as shown in table 7, makes the cost per patient contact vary significantly with the level of capacity utilization attained. As a result, comparisons are of value only to the extent that the facilities compared are operating at the same or some otherwise comparable level of capacity utilization; and the information available is inadequate to determine whether this is the case.

Thus, the figures of table 6 deserve to be viewed with greater-than-average caution. But they are of interest, nonethe-
less. As can be seen from them, some kind of comparison is possible for five of the eight programs reviewed: those of Botswana, Ghana, Indonesia, Tanzania, and Thailand. Four of the data sets permit a comparison among similar services provided by facilities of different levels of sophistication or complexity.

In three of the four cases (Ghana, Tanzania, Thailand), the average cost of a patient contact was notably lower in health posts than in more sophisticated facilities. In the fourth case (Indonesia), the cost was slightly but not significantly lower in the higher-level facilities.

The third comparison — between the cost of services provided and amount of health improvement produced — is the most difficult. But while a definitive assessment is not possible, several initial steps can be taken toward it. These steps start from the figures of table 8, which indicate the number of patient contacts supported by $250 of expenditure in each of the seven health post programs with the necessary information.

The figure of U.S.$ 250 has been selected in accordance with what appears to be an emerging belief that a developing country health program must be able to prevent a death at this cost or less in order to be competitive in cost-effective terms. This belief or convention has its roots in a well-known rough 1980 estimate that selective primary care should be able to prevent a death per $200-250 expended.71/ Recently, it has gained support from a World Bank staff review of the available information about the cost per death averted by health programs. Although the review
found too wide a range of variation to justify anything like total confidence, it concluded that the $200-250 figure is generally consistent with the empirical evidence.72/

Thus, for the sake of illustration, it seems worth asking how likely the programs reviewed here are to prevent one or more deaths per $250 expended.73/ As can be seen from the figures of table 8, this amount of money can support from 75 patient contacts in Brazil to 1250 patient contacts in Nepal. For convenience, this range can be referred to as running from roughly 100 to approximately 1000; and the question is whether the health programs described can reasonably be expected to save one life per 100-1000 visits -- or, to pose the same question another way, whether health posts can reasonably be expected to raise the average survival probability of those served by somewhere between .001 (from, say, .900 to .901) and .01 (from .900 to .910).74/

This question is obviously much more difficult to answer than to ask.75/ In the absence of the information needed for an answer, any effort to respond to it must be based primarily on the two pieces of information cited earlier: the indications from Botswana and Nepal that 75-90% of the patients visiting health posts were suffering from conditions that the services available should be able to help appreciably.76/ If the same is true of the other programs covered (as appears to be the case), it would seem plausible that the programs are producing -- or at least have the potential to produce -- gains of the magnitude necessary for them to be competitive when assessed in cost-effective terms.
In sum, health posts do not appear very expensive in relation to the resources potentially available to support them, with 1-3% of the GNP of a typical developing society being adequate to provide a volume of health post services which should, if effectively delivered, suffice to make some noticeable impact on health conditions. Also, although the comparisons are tricky, the evidence seems to indicate that health posts are usually less expensive per unit of service rendered than other, more sophisticated approaches to service delivery. Cost-effectiveness assessments are less certain still; but the information available suggests that health posts, if well planned and administered, should probably be considered potentially competitive with alternate approaches to primary care delivery.

V. Summary and Conclusions

As noted at the outset, health posts have been clearly proven potentially effective: there are several field projects in which approaches incorporating prominently the use of some kind of health post have produced notable health improvements -- infant mortality reductions of a third, a half, or more at modest cost. The issue is the extent to which this potential is being or can be realized in large-scale, ongoing programs featuring health posts.

As also indicated, there is at present no direct evidence on this. An examination of the health post experience must thus resort to indirect inference -- to a delineation of the features
of health-post programs which might reasonably be expected to influence the cost and effectiveness of those programs; to an assessment of the information available about those features; and to an effort to draw from that information some inferences and conclusions about the posts' cost-effectiveness.

Because of this indirect procedure, the conclusions are necessarily tentative. They can be summarized in five points:

--- First, for the amount of money they cost, health posts serve a lot of people. In some cases, as in Asia, they are serving fewer than they have the capacity to serve; in others, especially in Africa, the number of people they serve is larger, perhaps larger than they can handle adequately. Even when serving fewer people than they could (i.e., even when they are operating at below capacity), they are inexpensive enough for the services they offer to be affordable, in the sense that a volume of services which should be adequate to make a notable impact on health status if effectively delivered can be provided through health posts at a cost of no more than 1-3 percent of per capita gross national product. Services provided through health posts are probably less expensive on a per unit basis than those provided through more sophisticated facilities in most cases.

--- Second, most of those coming to health posts appear to be suffering from problems amenable to treatment by services that the posts should be able to provide. The gastrointestinal problems, respiratory and urinary tract infections, cases of malaria, and the other ailments which typically constitute
the majority of cases seen during the posts' general outpatient clinic sessions are among those generally thought not to require sophisticated treatment. Simple but effective therapies are available in such areas as child health and family planning, with which a significant proportion of health posts' more specialized services deal.

--- Third, health posts do not appear to be offering these therapies very well. The therapies or technologies featured are often of uncertain efficacy or relevance to the most pressing health issues among the populations served. The packages of maternal and child health services frequently provided, for instance, are of uncertain efficacy; and a significant amount of energy appears to be devoted to preventive activities of questionable value. The competence with which such technologies are delivered also often leaves much to be desired. The problem does not appear to lie with the technical qualifications of the personnel staffing the posts, which seem to range from fair to quite good. It arises, rather, from such dimensions of competence and quality as the amount of time and attention given to patients and the supply of drugs and equipment available.

--- Fourth, despite these well-known deficiencies, it is possible that health post programs as currently operated are competitive in cost-effective terms with the alternate modes of service delivery available. This is because the strengths of health posts noted in points one and two may well be sufficient to outweigh the problems summarized in point three.
Fifth, whatever the case with respect to the current situation, it seems likely that health posts are potentially competitive. While it is obviously unrealistic to expect the efficiency of health posts in large-scale programs to approach that achieved in small pilot projects, it does not seem unreasonable to think in terms of improvements significant enough to make posts quite attractive compared to the other alternatives available. 77/Health posts, in brief, have their strong points and may well be worth supporting despite the obvious shortcomings in their operations. These shortcomings are important, however; and it is at least as important to increase the value as to extend the coverage of the services that posts provide.
### TABLE 1

**Health Post Coverage:**

**Number of Annual Patient Contacts per Member of the Target Population**

<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Average No. of Patient Contacts per Facility</th>
<th>Target Population</th>
<th>Definition</th>
<th>Average No. of Patient Contacts per Member of the Tgt. Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana, 1974</td>
<td>9,526</td>
<td>5,423</td>
<td>Residing within 10 miles of facility</td>
<td>1.76</td>
</tr>
<tr>
<td>Brazil, 1982</td>
<td>6,620</td>
<td>11-12,000</td>
<td>&quot;Resident&quot; and &quot;non-resident&quot; population</td>
<td>0.55-0.60</td>
</tr>
<tr>
<td>Ghana, 1975/76</td>
<td>34,823</td>
<td>47,625</td>
<td>Residents of Subdistrict</td>
<td>0.73</td>
</tr>
<tr>
<td>Indonesia, 1982</td>
<td>5,589</td>
<td>36,077</td>
<td>Residents of Subdistrict</td>
<td>0.15</td>
</tr>
<tr>
<td>Nepal, c. 1976</td>
<td>6,950</td>
<td>26,333</td>
<td>Residents of Subdistrict</td>
<td>0.26</td>
</tr>
<tr>
<td>Swaziland, 1983</td>
<td>20,133</td>
<td>40,000</td>
<td>Residents of Country/No. of Facilities</td>
<td>0.50</td>
</tr>
<tr>
<td>Tanzania, 1978/79</td>
<td>27,696</td>
<td>10,258</td>
<td>Residents of Country/No. of Facilities</td>
<td>2.70</td>
</tr>
<tr>
<td>Thailand (Lampang), 1975</td>
<td>3,806</td>
<td>18,700</td>
<td>Residents of Subdistrict</td>
<td>0.20</td>
</tr>
<tr>
<td>Thailand (Suphanburi), 1977</td>
<td>1,387</td>
<td>14,000</td>
<td>Residents of Subdistrict</td>
<td>0.09</td>
</tr>
</tbody>
</table>
TABLE 1 (Cont'd.)

Sources and Notes:


Brazil. Froylan Moitla et. al., "Primary Health Care Operation Research Report from FSESP-Brazil - Johns Hopkins University on Community Health Workers/Community Water Supply Financing," draft manuscript, January 1985 (Mimeographed), pp. 45, 49-50. The "resident" population, consisting of 1-2000 people, is that living in close proximity to the post. The "non-resident" population refers to 10,000 or so people living further away but (apparently) not served by another post. The two groups together constitute a target population defined in a manner roughly comparable to that used to define the target populations of most of the other programs covered in the table. If the target population is defined more narrowly as the 1-2000 "Residents," as FSESP often does for its own operational purposes, then the coverage rate would be 3.3-6.6 instead of the 0.55-0.60 indicated.


Indonesia. Peter Alan Berman, "Equity and Cost in the Organization of Primary Health Care in Java, Indonesia" (Ph.D. dissertation, Cornell University, 1984), p. 335. The figures given refer to the average per subdistrict rather than to the average per post. They are somewhat higher than the per post figures would be, since a few of the subdistricts have more than one post or its equivalent.


Swaziland. Solveig Jensen and Bjarne Jensen, The Community Health Project: An Evaluation of Clinic Nurses' Job Performance and Assessment of the Community Health Project (Mbabane: Swaziland Institute of Health Sciences, January 1984), p. 65. In the absence of information about the size of the target population, it was assumed for illustrative purposes to consist of the entire population of Swaziland, divided by the number of clinic nurse-practitioners covered in the study. Since the posts in which these nurse-practitioners were stationed appear to represent only a portion of the total, this procedure probably understates the true coverage rate to a considerable degree.
TABLE 1 (Cont'd.)


Thailand (Suphanburi). Frederick A. Day and Boonlert Leoprapal, Patterns of Health Utilization in Upcountry Thailand: A Report on the Research Project on "The Effect of Location on Family Planning/Health Facility Use" (Bangkok: Institute for Population and Social Research, Mahidol University, December 1977), p.46. Among the reasons the Suphanburi coverage figure appears lower than that of Lampang is the apparent use of a more restrictive definition of what constitutes a patient contact.
### TABLE 2

Health Post Utilization:
Number of Daily Patient Contacts per Facility

<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Average Annual No. of Patient Contacts per Facility</th>
<th>Average No. of Working Days per Year (Assumed)</th>
<th>Average No. of Daily Patient Contacts per Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Africa</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botswana, 1974</td>
<td>9,526</td>
<td>250</td>
<td>38.1</td>
</tr>
<tr>
<td>Ghana, 1975/76</td>
<td>17,412</td>
<td>250</td>
<td>69.6</td>
</tr>
<tr>
<td>Swaziland, 1983</td>
<td>20,133</td>
<td>250</td>
<td>80.5</td>
</tr>
<tr>
<td>Tanzania, 1978/79</td>
<td>27,696</td>
<td>250</td>
<td>110.8</td>
</tr>
<tr>
<td><strong>Asia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia, 1982</td>
<td>5,589</td>
<td>250</td>
<td>22.4</td>
</tr>
<tr>
<td>Nepal, c.1976</td>
<td>6,950</td>
<td>250</td>
<td>27.8</td>
</tr>
<tr>
<td>Thailand (Lampang), 1975</td>
<td>3,508</td>
<td>250</td>
<td>15.2</td>
</tr>
<tr>
<td>Thailand (Suphanburi), 1977</td>
<td>1,387</td>
<td>250</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Latin America</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil, 1982</td>
<td>6,620</td>
<td>250</td>
<td>26.5</td>
</tr>
</tbody>
</table>
TABLE 2 (Cont'd.)

Sources and Notes:

Except for Ghana, figures in the column labelled "average number of daily patient contacts per facility" are from table 1. Their original sources are indicated there. For Ghana, the figure in that column is the corresponding figure of table 1 divided by two. This represents a crude adjustment to take into account the much larger size of the Ghanaian facilities, as explained in note 30 to the text.
### TABLE 3

**Health Post Patient Contacts According to Type of Contact**

<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Type of Contact</th>
<th>Percentage of Total Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana, 1974</td>
<td>General</td>
<td>76%</td>
</tr>
<tr>
<td></td>
<td>Antenatal/Family Planning/Child Welfare</td>
<td>24%</td>
</tr>
<tr>
<td>Ghana, 1975/76</td>
<td>Polyclinic</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>Antenatal and Child Clinic</td>
<td>20%</td>
</tr>
<tr>
<td>Indonesia, 1982</td>
<td>Illness Care</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Maternal and Child Health/Family Planning</td>
<td>50%</td>
</tr>
<tr>
<td>Thailand, 1975 (Lampang)</td>
<td>Medical Care</td>
<td>55%</td>
</tr>
<tr>
<td></td>
<td>Maternal and Child Health/Family Planning</td>
<td>45%</td>
</tr>
<tr>
<td>Thailand, 1977 (Suphanburi)</td>
<td>Outpatient</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>Family Planning</td>
<td>43%</td>
</tr>
</tbody>
</table>
TABLE 3 (Cont'd.)

Sources and Notes:

Botswana. Gish and Walker, Mobile Health Services, p. 102.


Thailand (Lampang). Rogosh et al., "Health System and Personnel Performance and Costs," p. 26. The figures presented refer to the percentage of direct service time spent by facility personnel on activity indicated rather than to number of patient contacts.

Thailand (Suphanburi). Day and Leoprapal, Patterns of Health Utilization in Upcountry Thailand, p. 46.
### Leading Problems among Patients Attending Health Post General Outpatient Clinic Sessions

<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Nature of Problem</th>
<th>Percentage of General Outpatient Clinic Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana, 1974</td>
<td>Respiratory</td>
<td>26.8%</td>
</tr>
<tr>
<td></td>
<td>Gastroenteritis/</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Malnutrition/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diseases of the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gastrointestinal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Venereal Disease/</td>
<td>13.9</td>
</tr>
<tr>
<td></td>
<td>Diseases of the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genito-Urinary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>63.8%</td>
</tr>
<tr>
<td>Nepal, c.1976</td>
<td>Parasites and</td>
<td>19.6%</td>
</tr>
<tr>
<td></td>
<td>Other Respiratory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gastrointestinal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respiratory</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td>Diarrhea/Dysentery</td>
<td>14.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50.8%</td>
</tr>
<tr>
<td>Swaziland, 1983</td>
<td>Respiratory Tract</td>
<td>15.1%</td>
</tr>
<tr>
<td></td>
<td>Infections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
<td>12.9</td>
</tr>
<tr>
<td></td>
<td>STD and Urinary</td>
<td>11.5</td>
</tr>
<tr>
<td></td>
<td>Infections</td>
<td>39.5%</td>
</tr>
<tr>
<td>Tanzania, 1978/79</td>
<td>Diarrhea/Dysentery</td>
<td>18.9%</td>
</tr>
<tr>
<td></td>
<td>Other Diseases of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the Gastrointestinal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Malaria</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>Diseases of the Respiratory System</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50.9%</td>
</tr>
</tbody>
</table>
Sources and Notes:

Botswana. Gish and Walker, Mobile Health Service, p. 103. Figures refer to new patients only.


### Table 5

**Health Post Affordability:**

Cost of Ten Patient Contacts as a Percentage of Annual Per Capita GNP

<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Cost of Ten Patient Contacts</th>
<th>Per Capita GNP</th>
<th>Cost of Ten Patient Contacts as Percentage of Per Capita GNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana, 1974</td>
<td>L.St. 6.83</td>
<td>L.St. 92.00</td>
<td>7.4%</td>
</tr>
<tr>
<td>Brazil, 1982</td>
<td>B.Cr. 6,190</td>
<td>B.Cr. 374,625</td>
<td>1.7%</td>
</tr>
<tr>
<td>Ghana, 1975/76</td>
<td>Gh.C. 20.00</td>
<td>Gh.C. 667.00</td>
<td>3.0%</td>
</tr>
<tr>
<td>Indonesia, 1982</td>
<td>I.Rp. 4,720</td>
<td>I.Rp. 328,640</td>
<td>1.4%</td>
</tr>
<tr>
<td>Nepal, c. 1976</td>
<td>N.Rp. 25.00</td>
<td>N.Rp. 1,012.50</td>
<td>2.5%</td>
</tr>
<tr>
<td>Tanzania, 1978/79</td>
<td>T.Sh. 19.00</td>
<td>T.Sh. 1,993.00</td>
<td>1.0%</td>
</tr>
<tr>
<td>Thailand (Lampang), 1975</td>
<td>T.B. 142.90</td>
<td>T.B. 7,426.00</td>
<td>1.9%</td>
</tr>
</tbody>
</table>
The cost of ten patient contacts is estimated on the basis of the information presented in the sources indicated below. Where possible, per capita GNP figures are taken from the same source. Where this was not possible, the dollar values of per capita GNP for the countries and years concerned were estimated from the 1984 World Development Report of the World Bank, by adjusting the 1982 per capita GNP figure given in Table 1 of that report by means of the growth and inflation rates for the preceding period also given in the same table. The resulting dollar figure was then translated into its local currency equivalent by applying the exchange rate for the year in question taken from the 1984 edition of the International Monetary Fund's International Financial Statistics Yearbook.

Botswana. Cish and Walker, Mobile Health Services, p. 118.


Ghana. IDS Health Group, "Health Needs and Services in Rural Ghana," pp. 448-49. The cost figure presented is based on the average for health centers and health posts, weighted according to the number of patient contacts by each.


Tanzania. Ministry of Health, Evaluation of the Health Sector, p. 43.

## TABLE 6
Cost per Patient Contact
According to Type of Facility
and Type of Contact

**BOTSWANA, 1974**

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Type of Facility</th>
<th>Cost per Patient Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Mobile(Air)</td>
<td>L.St. 1.39</td>
</tr>
<tr>
<td></td>
<td>Mobile(Land)</td>
<td>L.St. 0.63</td>
</tr>
<tr>
<td></td>
<td>Fixed</td>
<td>L.St. 0.68</td>
</tr>
</tbody>
</table>

**GHANA, 1975/76**

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Type of Facility</th>
<th>Cost per Patient Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient</td>
<td>Health Center</td>
<td>Gh.C. 2.28</td>
</tr>
<tr>
<td></td>
<td>Health Post</td>
<td>Gh.C. 1.56</td>
</tr>
</tbody>
</table>

**INDONESIA, 1982**

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Type of Facility</th>
<th>Cost per Patient Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Average</td>
<td>Health Center</td>
<td>I.Pp. 442</td>
</tr>
<tr>
<td></td>
<td>Health Subcenter</td>
<td>I.Rp. 472</td>
</tr>
<tr>
<td>Illness Care</td>
<td>I.Rp. 480</td>
<td></td>
</tr>
<tr>
<td>Maternal and Child Health/Family Planning</td>
<td>I.Rp. 288</td>
<td>I.Rp. 510</td>
</tr>
</tbody>
</table>

**NEPAL, c.1976**

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Type of Facility</th>
<th>Cost per Patient Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient Visit</td>
<td>Hospital</td>
<td>N.Rp. 5.95</td>
</tr>
<tr>
<td></td>
<td>Health Post</td>
<td>N.Rp. 2.50</td>
</tr>
</tbody>
</table>
TABLE 6 (Cont'd.)

TANZANIA, 1978/79

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Type of Facility</th>
<th>T. Sh. 4.60</th>
<th>T. Sh. 2.60</th>
<th>T. Sh. 1.90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient Visit</td>
<td>Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H. Center</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dispensary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THAILAND (Lampang), 1975

<table>
<thead>
<tr>
<th>Type of Contact</th>
<th>Type of Facility</th>
<th>T. B. 35.86</th>
<th>T. B. 14.29</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Average</td>
<td>T. B. 60.30</td>
<td>T. B. 10.07</td>
<td></td>
</tr>
<tr>
<td>Medical Care</td>
<td>T. B. 17.12</td>
<td>T. B. 2.86</td>
<td></td>
</tr>
<tr>
<td>Communicable Disease</td>
<td>T. B. 12.21</td>
<td>T. B. 19.05</td>
<td></td>
</tr>
<tr>
<td>Control/Sanitation</td>
<td>T. B. 33.06</td>
<td>T. B. 44.50</td>
<td></td>
</tr>
<tr>
<td>Maternal and Child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>T. B. 2.48</td>
<td>T. B. 2.48</td>
<td></td>
</tr>
<tr>
<td>Family Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources and Notes:


Ghana. IDS Health Group, "Health Needs and Services in Rural Ghana," pp. 448-49. Ghana figures include only recurrent costs.

Indonesia. Berman, "Equity and Cost in Primary Health Care in Java," p. 339. Overall average figures are weighted according to the distribution of services in subcenters.


Tanzania. Ministry of Health, Evaluation of the Health Sector, p. 43.

Thailand (Lampang). Rogosh et al., "Health System and Personnel Performance and Costs," pp. 29, 60. Overall average figures are weighted according to the distribution of services in subcenters.
<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Type of Cost</th>
<th>Percentage of Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana, 1974</td>
<td>Fixed</td>
<td>79.6%</td>
</tr>
<tr>
<td></td>
<td>Salaries</td>
<td>54.1%</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
<td>15.2</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>20.4%</td>
</tr>
<tr>
<td></td>
<td>Drugs</td>
<td>20.4%</td>
</tr>
<tr>
<td>Brazil, 1982</td>
<td>Fixed</td>
<td>77.9%</td>
</tr>
<tr>
<td></td>
<td>Salaries/Benefits</td>
<td>69.9%</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>Supervision</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Training</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>22.1%</td>
</tr>
<tr>
<td></td>
<td>Supplies</td>
<td>22.1%</td>
</tr>
<tr>
<td>Indonesia, 1982</td>
<td>Fixed</td>
<td>73.3%</td>
</tr>
<tr>
<td></td>
<td>Personnel</td>
<td>66.1%</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>26.7%</td>
</tr>
<tr>
<td></td>
<td>Drugs</td>
<td>25.3%</td>
</tr>
<tr>
<td></td>
<td>Operations/Maintenance/Supervision</td>
<td>1.4</td>
</tr>
<tr>
<td>Tanzania, 1978/79</td>
<td>Fixed</td>
<td>61.6%</td>
</tr>
<tr>
<td></td>
<td>Salaries</td>
<td>54.1%</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>38.4%</td>
</tr>
<tr>
<td></td>
<td>Supplies</td>
<td>25.3%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>13.1</td>
</tr>
<tr>
<td>Thailand, 1975 (Lampang)</td>
<td>Fixed</td>
<td>64.0%</td>
</tr>
<tr>
<td></td>
<td>Salaries</td>
<td>50.1%</td>
</tr>
<tr>
<td></td>
<td>Capital</td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Variable</td>
<td>36.0%</td>
</tr>
<tr>
<td></td>
<td>Expendables</td>
<td>36.0%</td>
</tr>
</tbody>
</table>
Sources and Notes:

**Botswana.** Gish and Walker, *Mobile Health Services*, p. 106.

**Brazil.** Moitla et al., "Primary Health Care Operation Research Report," p. 44.

**Indonesia.** Berman, "Equity and Cost in Primary Health Care in Java," pp. 307-08.


**Thailand (Lampang).** Rogosh et al., "Health System and Personnel Performance and Costs," p. 57.

Allocation of costs between fixed and variable categories is that of the present rather than the original authors. The allocation procedure adopted assumes that personnel are permanent government employees, so that salaries and other personnel costs are independent of the volume of services provided. In cases of uncertainty, costs have been allocated to the variable category.
<table>
<thead>
<tr>
<th>Country and Year</th>
<th>Cost per Patient Contact (in Local Currency)</th>
<th>Exchange Rate ($U.S./Unit of Lcl. Currency)</th>
<th>Cost per Patient Contact (in $U.S.)</th>
<th>Number of Patient Contacts per $U.S. 250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana, 1974</td>
<td>L.St. 0.68</td>
<td>2.34</td>
<td>1.59</td>
<td>157</td>
</tr>
<tr>
<td>Brazil, 1982</td>
<td>B.Cr. 619</td>
<td>.0056</td>
<td>3.45</td>
<td>75</td>
</tr>
<tr>
<td>Ghana, 1975/76</td>
<td>Gh.C. 2.00</td>
<td>0.87</td>
<td>1.74</td>
<td>144</td>
</tr>
<tr>
<td>Indonesia, 1982</td>
<td>I.Rp. 472</td>
<td>.0015</td>
<td>0.71</td>
<td>352</td>
</tr>
<tr>
<td>Nepal, c.1976</td>
<td>N.Rp. 2.50</td>
<td>0.08</td>
<td>0.20</td>
<td>1250</td>
</tr>
<tr>
<td>Tanzania, 1978/79</td>
<td>T.Sh. 1.90</td>
<td>0.126</td>
<td>0.24</td>
<td>1042</td>
</tr>
<tr>
<td>Thailand (Lampang), 1975</td>
<td>T.B. 14.29</td>
<td>0.049</td>
<td>0.70</td>
<td>357</td>
</tr>
</tbody>
</table>
Sources and Notes:

The figures in the column labelled "cost per patient contact in local currency" are drawn from those for the cost of ten patient contacts presented in the table 5. Their original sources are indicated there.

The exchange rates, which refer to the year indicated for each country, are taken from the 1984 edition of the International Monetary Fund's *International Financial Statistics Yearbook*.

In each case, the cost of a patient visit in local currency is multiplied by the exchange rate and then divided into $U.S. 250 to produce the figure in the right-hand column.
NOTES

Thanks go to David de Ferranti and Anthony Measham for their careful and thorough comments on an earlier version of this paper. Neither, of course, is to be held responsible for any remaining deficiencies.

1. Examples of experimental projects include programs in Jamkhed and Narangwal, India; Kavar, Iran; Hanover, Jamaica; and Imesi, Nigeria. For further information on these and other programs, see Davidson R. Gwatkin, Janet R. Wilcox, and Joe D. Wray, Can Health and Nutrition Interventions Make a Difference? ("Overseas Development Council Monograph No. 13"; Washington, D.C.: Overseas Development Council, February 1980). The two best-known larger areas where health posts are thought to have played a significant role in improved health status are Sri Lanka, and Kerala state in India. Discussions of these programs and of the other features which make Kerala and Sri Lanka unique, are to be found in Davidson R. Gwatkin, "Food Policy, Nutrition, and Survival: The Cases of Kerala and Sri Lanka," Food Policy, Vol. 4, No. 4 (November 1979), pp. 245-58; and United Nations, Department of Social and Economic Affairs, Poverty, Unemployment and Development Policy: A Case Study of Selected Issues with Reference to Kerala (ST/ESA/29; New York: United Nations, 1975).

2. This is to be distinguished from the provision of services particularly desired by the population in order to help fulfill the population's felt needs, which is probably the most frequently mentioned other objective of health post programs. The two objectives (health improvement and the fulfillment of felt needs) are related in that the provision of at least minimally desired services is a necessary condition for an improvement in health status. (Unless the services provided by a health post bear at least some relation to those the population wants, no one will come for them; and without serving people, a health post cannot produce improvements in health status.) But it is not a sufficient condition, and the converse does not always hold true. In particular, it is quite possible for a health post to be providing services of limited therapeutic value which people strongly desire while leaving much more important illnesses untreated -- thus producing little if any impact on health status. (An example would be a health post whose staff members were, in response to public demand, spending much of their time providing injections of little therapeutic value and first aid for minor injuries while doing nothing to treat potentially fatal infant diarrheas not recognized as important by the population.) The fulfillment of a population's felt needs is obviously a legitimate and important objective of a health program, to which political leaders responsive to popular concerns as well as the people themselves might well attach a higher priority than to health status improvements. Unfortunately, however, an
examination of the extent to which health posts represent a cost-effective approach to the fulfillment of felt needs and/or other objectives would require far more space than is available here. For this reason, health post program objectives other than health status improvement are not included in the framework.

3. This usage is in line with the common practice according to which the expression "cost-benefit" is reserved for comparisons between costs and benefits when both are measured in financial or economic terms.

4. The list is adapted from the framework presented in a paper dealing with community health workers by Peter A. Berman, Davidson K. Gwatkin, and Susan E. Burger which is a companion piece to the present work.

5. This implies that programs serving some population groups will have more of an impact than programs which serve others. An example concerns programs serving the poor. To the extent that the poor are more likely to suffer from illnesses amenable to the simple treatments health posts can provide, and to the extent the poor are less likely to obtain effective care through some other source, then a health service program serving predominantly poor people would, ceteris paribus, produce more health benefits than a program serving the better off.

6. As is well known, it is quite possible for a program to be effective without being efficient, and vice versa. If enough resources are applied, for example, a program might reach 100 percent of the population at risk while working at only 10 percent of capacity. Such a program could be very effective in the sense of bringing about significant health improvements while being very inefficient in the sense of utilizing far more resources than required per unit of health improvement achieved. Conversely, a program might operate at 100 percent of capacity but, because of limited resources, reach only 10 percent of the population at risk. Such a program might be very efficient but, because of its small size relative to the need, would probably be quite ineffective with respect to the production of measurable health improvements.

7. Few technologies or approaches will be equally promising with respect to efficacy, relevance, and acceptability. As a result, compromise and adaptability in administration will be required for the determination of an optimal mix. It may well be, for instance, that technologies which are not initially acceptable or of interest to the population are still worth emphasizing if they are efficacious enough against a health problem of central importance. For example, diarrhea is often so important a cause of infant death and oral rehydration has been shown to be so simple and potentially effective if properly administered that an emphasis on oral rehydration might be considered justifiable even in a...
setting where mothers initially have no interest in it because they consider infant diarrhea a natural, unavoidable part of growing up, rather than a potentially dangerous, curable illness. (The recognition of oral rehydration's lack of acceptability would, of course, change significantly the strategy for its introduction, which would need to feature much more active educational or marketing efforts than customary in service-oriented health posts.) Similarly, there are situations where highly acceptable but inefficacious or irrelevant approaches might be worth offering. Food supplements for malnourished infants, for instance, have rarely been shown to result in improved growth and development; but where they are popular, their use might be justified as a means of attracting mothers and children for other services, such as immunizations, which do have a demonstrated efficacy.

8. In speaking of primary health care systems, it is particularly important to distinguish between the ratio of capital to recurrent costs on the one hand and that of fixed to variable costs on the other. Because of the way that a health program's large personnel costs are treated, the two ratios are very different. As governmental health systems are normally organized, personnel costs are both recurrent and fixed: recurrent because they must be paid at regular intervals; fixed because health workers are salaried employees who are paid the same amount regardless of the number of patients they serve. As a result, the ratio of capital to recurrent costs is normally low; that of fixed to variable costs is usually high. (For more on this, see note 69, below.)

9. The other two studies in the trilogy deal with community health workers and with mobile health units. As indicated above (in note 4), the former is by Peter A. Berman, Davidson R. Gwatkin, and Susan E. Burger; the latter by Gwatkin, Berman, and Burger.

10. Among the several studies of physician-directed primary health centers excluded from consideration in the present review by this focus on care provided by paramedical personnel are the Cairo University project in Egypt (Cairo University - MIT Technological Planning Program, "Results of the Health System Questionnaire Administered by the Ministry of Health, Arab Republic of Egypt at 132 Health Centers and Units, March - April 1978: A Reference Manual," MIT - Cairo University Health Care Delivery Systems Project Monograph #3, May 1980 (Mimeographed)); the work of the Johns Hopkins University School of Hygiene and Public Health with primary health centers in India (Department of International Health of the Johns Hopkins University School of Hygiene and Public Health, The Functional Analysis of Health Needs and Services (New Delhi: Asia Publishing Company, 1976)); and the activities of Management Sciences for Health in Afghanistan (John W. LeSar and Ronald W. O'Connor, "Working with What Exists: The Basic Health Center System," in Managing Health Systems in Developing Areas: Experiences from Afghanistan, ed. Ronald W. O'Connor (Lexington, Massachusetts
11. The studies which constitute the principal sources of information for this report usually cover only a small portion of the posts operated by the programs under review. The posts selected, often those in one or more roughly typical geographic areas of the country concerned, rarely represent a scientifically drawn sample; but the study authors appear in each case to have made an earnest effort to identify posts that are at least reasonably representative of those operated by the program in question.


18. Planning Unit, Ministry of Health, The United Republic of Tanzania, Evaluation of the Health Sector, 1979 (Dar es Salaam: The Ministry, October 1980); Planning Unit, Ministry of Health,

19. Material on Lampang is drawn from a number of the documents contained in the six-volume series produced by the Lampang Health Development Project. Of particular relevance is John Rogosh et al., "Health System and Personnel Performance and Costs," Monograph 9 in Evaluation of the Lampang Integrated Rural Health Services and Primary Health Care System ("Lampang Health Development Project Documentary Series, Vol. III"; Bangkok: Ministry of Public Health, 1981). The material presented in the text is drawn from a baseline survey executed at the beginning of the health development project and thus refers to the health system as it existed prior to the project's efforts to expand it. The material does not refer to the performance of the facilities and projects introduced later by the project. Material on Suphanburi is from Frederick A. Day and Boonlert Leoprapal, Patterns of Health Utilization in Upcountry Thailand: A Report of the Research Project on "The Effect of Location on Family Planning/Health Facility Use" (Bangkok: Institute for Population and Social Research, Mahidol University, December 1977).

20. And even if there were, it would be extremely difficult to separate the effects of health posts from those of other components of the larger health systems to which they belong.

21. The magnitude of the problem can be illustrated with reference to Nepal. When asked how many people they served, health post personnel indicated an average of about forty per day. (Shah et al., Rural Health Needs: Report of a Study in Tanahu, Nepal, p. 21.) Service statistics for the same clinics suggest a figure of twenty-five to thirty. (Ibid., table B-1. In order to facilitate comparability with figures from other programs, the service statistics are those appearing in tables 1 and 2.) An outside observer with extensive field experience in Nepal suggests a figure of ten to thirty (for the country as a whole). (Justice, "The Invisible Worker," p. 968.)

22. The figures of table 1 reflect three different approaches to the definition of the target population, the denominator of the coverage rate. The first and most common -- as in Indonesia, for example -- is to define the target population as the number of people living in the administrative division in which the post is located. The comparability of the coverage rates of programs with the target populations defined in this way depends upon the comparability of the administrative divisions. The second approach is to recognize that most of a health post's clients are likely to come from within the portion of the administrative division lying near the post, and to consider only the people residing in that portion as the target population. The exclusion of part of the administrative division's population from the denominator will result in a higher coverage figure. This can be seen from
the example of Brazil, where the target population is sometimes
defined as the one-tenth or so of the total population of the
district living closest to the post. The third approach, used
in deriving the Tanzania figures, is to consider the entire popu-
lation of the country as the target population, and to divide
the total number of patient contacts of all health posts by it.
This has the effect of including in the denominator people living
in areas not covered at all by posts, and others (in urban areas,
for instance) being served by other facilities. The result is
a lower coverage figure than produced by either of the other two
procedures.

23. Gish and Walker, Mobile Health Services, p. 53.

24. Moitla et al., "Primary Health Care Operation Research

25. Gish and Walker, Mobile Health Services, pp. 102, 104.

Strictly speaking, the figures provided refer to utilization and
can be taken to refer to coverage only if, as seems reasonable,
the target population of each clinic is assumed to be approximately
the same.

27. Berman, "Equity and Cost in Primary Health Care in Java,"
pp. 170, 335.

28. Moitla et al., "Primary Health Care Operation Research

29. The fact that health post contacts are not distributed
evenly among the population, it should be noted, does not mean
that the impact of those contacts on the population's overall
health status is necessarily reduced. Whether it is or not will
depend upon whether the therapeutic value of a second and succeeding
contact with a health post by the same individual is more, the
same, or less than that of the preceding contact. If, as Gish
and Walker imply for Botswana, most ailments seen are of a kind
that require at least two visits for any benefit to result, then
the value of the second visit would be greater than that of the
first; and a maldistribution of the limited supply of patient
contacts would increase the effect of those visits on the overall
health status of Botswana's population. (Gish and Walker, Mobile
Health Services, p.110.)

30. The impression given by the limited information provided
is that the health posts of the eight programs covered are roughly
equal in size, with the exception of those in Ghana. On average,
the Ghanaian facilities appear about twice as large as those of
the other programs, with an average of 7-8 paramedical personnel
per facility, compared with 2-4 paramedical personnel per facility
elsewhere. Each Ghanaian facility should thus probably be considered the equivalent of two facilities in the other programs; and the utilization figures have been adjusted to reflect this fact, as described in the notes to Table 2.

31. As indicated in the notes to Table 1, the unusually low Suphanburi figure appears attributable in part to a more restrictive definition of a patient contact than used in the Lampang, Thailand project, which reported a utilization rate about three times that of Suphanburi (but still notably lower than reported by any of the programs from other countries).

32. Forty to fifty would be the approximate number of patients contacted by a single-unit health post during an eight-hour day if each patient is seen for ten to twelve minutes. This number would be optimal to the extent that the patients' health problems and the technologies/approaches available to treat them are such that ten to twelve minutes would be "about right," in the sense that the therapeutic value of a patient contact would decline sharply if less time were available but would not increase appreciably if more time were allocated. This does not mean that a health post seeing an average of forty to fifty patients a day is necessarily working at full capacity as defined in terms of its own standards. To judge from the available reports about post utilization summarized in Section IV.C, a post contacting that number of people is likely to provide brief consultations for them during the morning hours, then to stand vacant for the rest of the day. In terms of its own standards, the post would have a great deal of excess capacity in the sense that it could accommodate many more patients during its hours of operation for the brief visits (of limited value, according to the norm suggested here) which typify its operations.

33. "In most cases," report Gish and Walker from Botswana, "utilization rates could be far higher without necessitating increases in staff...," suggesting that, as just indicated in note 32, what seems like full utilization in terms of the norm suggested here does not necessarily appear as such when judged by the standard operating procedures of the health posts being observed. (Gish and Walker, Mobile Health Services, p. 104.)

34. For an indication of the central role that pharmacies play in the provision of health care in rural Thailand, see Day and Leoprapal, Patterns of Health Utilization in Upcountry Thailand, p. 55.

35. Particularly distinctive are the significant proportion of staff time spent on extended home visits for the delivery of medical care and the greater-than-usual length of consultations in the post itself. (Hoitla et al., "Primary Health Care Operation Research Report," pp. 49, 52-53.)
36. If the ailments are not potentially significant, the time spent treating them is obviously not productive. If they are significant but require more sophisticated treatment than the post can provide, the patients suffering from them can be referred to higher-level facilities; but this involves the possibility that many of those referred will not take advantage of the referral, in which case the time spent on their ailments will also have been wasted.


38. Estimated from data presented in Gish and Walker, Mobile Health Services, p. 118.


43. Day and Leoprapal, Patterns of Health Utilization in Up-country Thailand, pp. 42-44.


52. Ibid., p. 424; Jensen and Jensen, *The Community Health Project*, pp. 41-42.


57. Moitla et al., "*Primary Health Care Operation Research Report,*" p. 52.


64. Another manifestation of this is to be found in frequent reports that only a minority of health post staff time is devoted to direct patient service. In Lampang, Thailand, for example, only about 10 percent of health post staff time went for direct patient service. About one-half of staff time was spent on activities categorized as non-productive, much of it waiting for patients. (Rogosh et al., "Health System and Personnel Performance
and Costs," pp. 22-24.) (See note 65 for a similar report of time unproductively spent waiting for patients in Nepal.)


66. The figure of ten patient contacts happens to approximate the average annual number of contacts per person in some of the Eastern European countries often thought to have effective health services. (Information for Czechoslovakia and Yugoslavia made available by Anthony Measham.) Other than that, its selection is arbitrary, made on the basis of its pleasantly round nature in the absence of any known empirical basis for a selection.

67. The difficulty can be illustrated with one of the comparisons appearing in the data for Lampang, Thailand: that between the cost of a (presumably outpatient) medical care contact at a hospital and the cost of a medical care patient contact at a health post. As can be seen from table 6, the former is six times as high as the latter. But it is not necessarily correct to attribute the difference to waste or inefficiency (or, to note in passing a point to be discussed further below, to a lower rate of utilization) at the hospital. At least part of it might well result from the fact that more complete care (such as examinations by specialists and more laboratory tests) is provided to hospital outpatients. If these extra services produce no additional health benefits, then hospital outpatient visits are no more therapeutically effective than health post patient contacts, and the two can be legitimately equated in terms of output for cost comparisons. But one cannot rule out the possibility that hospital outpatient visits were more effective for those treated through them: that, for example, the particular people seen in the hospitals' outpatient clinics -- at least some of whom were no doubt people suffering from complex ailments who had been referred from health posts -- needed and benefitted from the extra care provided.

68. This point can also be illustrated with reference to the Lampang data of table 6. As can be seen there, the cost per patient contact is less at a health post than at a hospital for medical care, communicable disease control, and sanitation; but it is more for maternal and child health, family planning, and nutrition. A principal reason that the overall average cost indicated on table 6 ends up favoring the health post is that the mix of services offered is heavily weighted toward those services -- especially medical care -- which the health posts provide less expensively. If one were to prefer instead a service mix featuring maternal and child health, family planning, and nutrition, then hospitals would be preferable from a cost perspective.

69. As can be seen from table 7, some 60 to 80 percent of the total costs of the programs reviewed are fixed. The fact that these costs must be paid regardless of whether patients are
contacted means that the average cost per patient contact will be high when capacity utilization is low, and low when capacity utilization is high. (In a program where 75 percent of costs are fixed, for instance, the average cost per patient contact would be 75 percent higher in a post working at one-half instead of full capacity. If only 25 percent of the costs are fixed, the average cost would be 25 percent higher at half than at full capacity.) The high ratio of fixed to variable costs is less an inherent feature of health post programs than a consequence of the way in which those programs are usually organized. As can be seen from table 7, staff salaries and benefits represent the largest single category of expense, typically constituting 50-70 percent of the total. Staff costs can be either fixed or variable, depending upon how the activities being undertaken are structured. When workers are remunerated on a piecework or fee-for-service basis, as many professionals are in private medicine, then labor costs are variable. But those who staff governmental health posts normally work on a salary whose amount is independent of the volume of service they provide. The cost of their services is thus largely fixed, although a certain amount of variability can be introduced, at least in principle, by allocating workers away from particularly idle toward especially busy facilities.

The importance of comparable levels of capacity utilization becomes even more important in comparing different types of facilities because of likely differences in the ratio of fixed to variable costs between them. The point can be illustrated through a simple example featuring two programs, A and B, with ratios of fixed to variable costs of 75/25 and 25/75, respectively. Assume that the average cost per patient contact of the two programs is the same when both are operating at full capacity. When both are operating at 50 percent of capacity, the average cost of a patient contact will be 40 percent higher in program A. If program A is operating at 75 percent of capacity and program B at 25 percent, the average cost per contact will be about 30 percent lower in program A. If the percentage utilization of the two programs were reversed -- i.e. if program A were operating at 25 percent of capacity and program B at 75 percent -- each patient contact through program A would cost around the times as much as a patient contact through program B.


The concept of a death prevented is clearly inadequate
for any serious study of health program cost-effectiveness with respect to mortality and is used here, in accordance with common practice, because of the absence of any operationally viable alternative. Since everyone dies sometime, there is no such thing as a prevented or averted death. Deaths are only delayed. Thus, conceptually speaking, it would be far preferable to speak in terms of the additional months or years of life expectancy added by a given health intervention -- or better yet, in terms of the number of days, months, or years of healthy life added, so that morbidity considerations might also be taken into account. An approach of this sort would allow consideration of the impact of competing risks of death at a later age, which is not possible when a program's impact is assessed in terms of the number of deaths prevented. Unfortunately, such approaches or concepts have not yet been well enough explored to permit their use in a review of this sort.

74. If the survival probability of each of 1000 (100) patients to a health post is increased by .001 (.01), the result would be the prevention of one death per 1000 (100) patient contacts.

75. It need not remain so. It would seem quite feasible to produce at least a crude estimate of the deaths or days of morbidity prevented by a health post through observational studies conducted by qualified clinicians. The information gathered would feature, for a statistically adequate number of health post patients, professional judgments concerning the probable course of the ailments treated with and in the absence of the treatment provided.

76. See the material cited in notes 38 and 39.

77. In thinking of improvements that might be made, there is obviously no need to be limited by the configuration of programs health posts currently feature. A health post can be seen as a facility and group of people to be used in any of a broad range of ways. If, for instance, pharmacies are widely used (as in Thailand), one might wish to think of helping pharmacies perform more effectively the dispensary functions normally associated with health posts, and of finding new roles for the posts. Another idea, from India, is to take a different cut at the problem. Instead of trying to provide a package of health services suitable for a wide range of people, one might think of gathering together a particular group of people with similar problems and offering them a wide range of health and non-health services relevant to those problems. This is the idea behind the Indian Integrated Child Development Services (ICDS) Scheme, which appears to be doing very well in providing a package of education, health, and nutrition services for children under six years of age who are brought together in child care centers visited regularly by health and other personnel. (For more on the ICDS, see Integrated Child Development Services Central Technical Committee, "A Coordinated Approach to Children's Health in India: Progress Report after