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## **Manpower and Primary Health Care**



# **Manpower and Primary Health Care**

**Guidelines for Improving/Expanding Health  
Service Coverage in Developing Countries**

**EDITED BY RICHARD A. SMITH, M.D., M.P.H.**

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**To the peace that comes with well-being**

**To the children who also will know it**

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## Foreword

This book describes an approach to organizing improved and expanded primary health care systems, an approach derived from many sources. The chapters contain what the authors have found to be a useful way of grouping the problems confronted by those responsible for delivering primary health services to a majority of their populations. These chapters are also guidelines, reflecting practical experience, which are intended to encourage others to find and develop their own country-specific methods to solve their own country-specific problems.

Some of the basic elements may be considered appropriate to any setting; others will prove useful only in certain situations. However, the cumulative wisdom with experience set forth in this book heralds an era of a "new" provider of primary health care services—a provider who is becoming integral to the health scene in many developed and developing countries.

The University of Hawaii's Health Manpower Development Staff (HMDS) has evolved an approach to extending the capacity of doctors and to expanding medical care and other health service coverage by using new types of health practitioners. The pragmatism of this approach, which is medically sound and concerned simultaneously with appropriate deployment and adequate logistical sup-

port, is being embraced by a growing number of international organizations, governments, and international health experts. It is characteristic of Hawaii and our university that one of the areas of emphasis in developing new types of practitioners has been the needs of the practitioners themselves with respect to their personal fulfillment and professional identity. This, in turn, has powerful effects on our basic concern, the welfare of the populations they serve.

We welcome the opportunity to share our professional experience in this area of development.

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## Preface

The conventional delivery of health services in highly industrialized societies is characterized by high cost, big buildings, orientation to episodic illness, and reliance on sophisticated technology. This, unfortunately, has been the "model" for much of the developing world and attempts to transplant this prestigious prototype have met with varying degrees of success. Because of the luxurious social, political, and economic superstructure required to support this high-level technology, medical care (illness-oriented) services have been accessible only to relatively small numbers of the urban populations in the Third World.

Today, however, even developed nations are recognizing that traditional Western medical education does not meet their needs for medical care (much less for health care) because of problems of cost, organization, and accessibility. As a result, medical education is changing in developed countries. If developing nations do not assess their needs today and also make changes, they may be left with an antiquated transplant that resembles the site of origin more than the site of origin resembles its old self.

In examining the need for change and solving the present problems of health coverage, the critical characteristic of new and evolving health systems should be *appropriateness*. Concurrently, the pervasive description of the change that occurs in moving from an

imposed or otherwise inadequate health care system to one more relevant to contemporary local needs should be *flexibility*. A design approach to these problems has many facets which are described herein as guidelines for primary health care programs based on "new" kinds of health manpower. These guidelines are under a single new rubric or image and may assist developmental planners and program implementers to deal effectively with local as well as international bureaucracies.

This alternative approach cannot be evaluated in terms of the number of hospital beds in use, or highly specialized doctors produced, or the number of cobalt radiation therapy machines in the country. Instead, it should be evaluated in terms of increased health coverage with appropriate curative, preventive, and health promotion services—with the emphasis on prevention. It should be evaluated in terms of the population's perception of their well-being as a result of relevant services being delivered. It could be evaluated over a long time in terms of increased productivity and ultimately in terms of improved health indices.

It is imperative to state at the outset that answers to questions about health services and manpower development will be found only by health professionals who work in health institutions in their own countries. The solutions to problems of primary health care lie within the borders of each country and not within the thousands of pages written on the subject in the world literature. Nor are all the answers known to the myriad of visiting experts. This book does not propose a panacea for problems of primary health care since there is no single, simple transplantable answer. Rather, these guidelines are an attempt to telescope selected information and experiences that have been shared by professionals in this field in developed and developing countries. What may appear as loosely organized information, on one hand, and rigid pronouncements, on the other, are reflections of the difficulty of sharing information that comes from diverse sources. The provision of objective parameters and subjective support for those matters too complicated to explain across social and cultural lines has inevitably produced a certain mix of presentations and style in these guidelines.

When money available for health programs is limited, a country can turn to more appropriate approaches. In some settings, where the educational level of the available manpower pool is low and traditional training approaches are irrelevant, planners can turn to approaches that reflect today's needs and today's resources.

Marshall McLuhan set the stage for this book when he wrote: "Our Age of Anxiety is, in great part, the result of trying to do today's job with yesterday's tools—with yesterday's concepts." N. R. E. Fendall (a longtime inspiration for many of us in the health field) began lifting the curtain for this undertaking when he wrote:

Medicine throughout the 20th Century has been brilliant in its discoveries, superb in its technological breakthroughs, but woefully inept in its applications to those most in need. . . . The implementation gap must be closed.

The need for continued research in medicine and health services operations cannot be denied. However, today's pressing challenge lies in taking available knowledge and technology, adapting them to local needs, and finding practical ways to use them for solving the growing global problems of health care coverage.

You are invited to join us in the following pages as we initially take a broad, general look at health's role in development. The theoretical model discussed in the first chapter leads to its practical application in subsequent chapters as our collective experiences in solving some major health problems over the past eight years are described. Also expressed are expectations for primary health care as it is provided by members of a newly configured health team. Sharing these experiences goes with the hope that we can continue to serve as one of many sources of information and cooperation in this important field. The past is prologue for these guidelines: they are suggestions to help planners decide how to appropriately improve/expand primary health services for their countries' specific needs.

RICHARD A. SMITH

CHAPTER 1

## **The Emerging Role of Health in Development**

*Richard A. Smith and Rodney N. Powell*

Planners have begun to drastically revise their approach to achieving growth with equity in Third World development. To lessen burgeoning socioeconomic and political tensions, the emphasis must be on labor-intensive instead of capital-intensive policies (1, 2). Ideally, the highest priority should be given to integrated multi-sectoral community development as a series of simultaneous undertakings.

The contributors to this book make no pretenses of having background in all aspects of development. It is only our experience in health and health-related sectors that we wish to share, experience that is inextricably linked to global interest in improving individual and community well-being. It is our intention to demonstrate that once a national decision to promote social equity is made, appropriate and effective approaches to achieving this objective can be found. This effort can be enhanced if past experiences and presently available knowledge are taken into consideration when a country seeks its own specific solutions to its problems. The agrarian societies that have developed most successfully in this century strongly emphasized keeping their labor forces nourished, healthy, and therefore productive. Thus, health is viewed as more than a basic human right; it also is an excellent investment in economic development (3).

The destinies of the world's developed and developing nations are tied together because of the meshing of their economies. Nowhere is this more evident than in the dependence of the former on the raw materials of the latter. However, the gaps in the distribution of wealth between the world's poor and its affluent are wide and growing wider. The developing countries do not share equitably in the world's wealth, yet their populations continue to grow while their export earnings and expenditures on health and education continue to decline (4). Although the developing world contains over two-thirds of the world's working population, in 1970 this 67% of the world's labor force produced only 15% of its wealth.

According to many economists and agencies like the World Bank, economic growth in the world's poorest countries as measured by gross national product for the decade beginning in 1970 has fallen considerably short of development goals. Gross national product as used in the World Bank's data is the sum of all goods and services produced in each country measured in constant U.S. dollars based on 1973-1975 averages. In constant dollars the per capita gross national product of the poorest nations, which increased from an average of \$110 in 1960 to \$120 in 1965 and \$130 in 1970, has shown no further gain. In terms of an index with 1970 equal to 100, the 1975 figure is only 98.9. Real economic growth has stagnated while the amount of the debt of the world's poorest nations has risen sharply. This rising debt and shortfall of economic development goals affects political stability, productivity, and consequently the health of over two-thirds of the world's population, with the poorest countries being concentrated in Asia, Africa, and Latin America. There are 1.7 billion people living in these nations compared to 682 million in the industrialized countries. Given the world's present population of 3.8 billion people, less than a third live in the developed world and by 1980 this figure will have fallen to one quarter (5). Investment in the infrastructure and systems to deliver essential primary health care services to three-fourths of the world's population is now being considered beyond health's previous cosmetic role in development. Health is thus be-

ing viewed as a critical investment to maintain political stability and promote developmental growth.

Growth and development in the Third World have long been linked to what Pran Chopra calls a *gospel of growth* (6). This gospel emphasizes Western-style modernization and industrialization with sophisticated imported technology. Development thus has been based more on the economies of distant nations than on the needs of a developing country's own people or the people of neighboring countries. This approach to development flourishes in Third World countries that lack strong economic underpinning, efficient and reasonably wide-based administrative capability, and adequate contact between governments and their people.

In many countries, however, this *gospel of growth* has been replaced by a shift in emphasis from industry to agriculture, from capital-intensive, high-technology industry to medium-technology industry based on local raw materials, and from Western to indigenous modernization. Under these circumstances development is still possible in one of two directions. It can be mandated from above, receive appropriate inputs and support centrally, and flow from the top down and out to the people. Or it can originate and flow upward from investments made in and by people at the grass-roots who have indicated a desire to participate in their individual, community, and/or national development. Political factors determine whether development will be mandatory (imposed so as to "trickle down") or participative (local investments made to "bubble up").

This book describes an approach to one aspect of development (primary health care) based on a third choice: that of combining the mandated and participative modes. The combination is accomplished through joining the two modes by an intermediate-level paraprofessional who provides the linkage and two-way communication that give the system long-term viability and productivity. The next chapter describes the construction of the infrastructure of this third alternative. But first, it is important to examine some of the obvious characteristics of a change in emphasis from a capital-intensive development policy to a labor-intensive policy. It

is also important to be aware that impetus was given to this movement by the economic recession of the mid-1970s. Health is growing in importance in its relation to global development and it must be examined within a contemporary context before we proceed to implications of the approach to primary health care described herein as a developmental tactic.

Increasingly, as attention is paid to the role of the individual in society, capital has to share its former pedestal in development schemes. In the past, capital was omnipotent, paramount—almost a deity in development. Now the spotlight is shared with a more appropriate instrument of development: the human resources of societies. This move towards humanism is incompatible in many ways with capital-intensive development policies. It signifies recognition that exploitation of the many by a few has to be abandoned if signs of development are to be seen continuously in developing countries. Governments are moving or being moved toward social equity as a means of improving the well-being of its citizenry. In the complex world of development, it is no accident that the health (well-being) of a population is related to political stability and improved productivity.

A review of the situation in the Indian state of Kerala reveals the dynamic and changing nature of the multiple inputs required to address the problems of poverty, unemployment, health, and development policy. A United Nations study of Kerala, one of the most lucid analyses of the complex network of cause and effect in this arena, shows that Kerala's multilevel approach to development is particularly effective (7). Kerala has given attention to ways of providing the minimum essentials of life to its population. Its efforts in nutrition (agriculture and food distribution), housing, health services, redistributive land reforms, and education are the fabric of this network of development. These separate efforts are woven into a developmental network like a spider's web. A push or pull at any one place bends another part of the web and alters the structural harmony, since each strand of web or development depends on another in some way for its support and growth. Yet all the strands

#### EMERGING ROLE OF HEALTH IN DEVELOPMENT

together support the state's forward movement. In such a plan, if a strand is missing, the structural support for continual development is not up to the full strength, potential, or intensity needed to maintain momentum. Development, as a function of many factors, will proceed at different rates in different countries and the network will be composed of different factors. The speed of development in each country will depend upon a people's ability to deal with their environment and the social, cultural, and economic superstructure of their society.

The developmental network that promotes individual well-being is operating in Kerala. Its components have been measured and, taken together, they form a model for other areas. It is a modern, tangible study in development, targeted and reaching the objective of improving the quality of life of a population. It accomplishes this objective by coordinating development undertakings so that they mutually and continuously reinforce each other's growth. This interdigitating support, which recognizes the interdependence of developmental growth fields, is conceptually probably more important in labor-intensive growth policies than in capital-intensive policies. The interdependence produces significant dynamism or noise in the system (the fearful might call it uneasiness about inevitably rising expectations) which results in a wider spread or sharing of the business of nation-strengthening. Opportunities that arise for individuals to invest simultaneously in their personal and national development are the backbone of this change in development policy.

Global recession accentuates the need to strengthen labor-intensive policies as capital becomes increasingly scarce. Political philosophies help shape postures but do not feed, house, or create a sense of well-being in a population. For these basic necessities populations must rely on the basic providers—themselves. This need for self-reliance causes many nations to mobilize national resources to the fullest. It forces countries to set more realistic goals since fluctuating economic situations may temporarily define the limits of industrial growth. Countries have growing reasons to bind their destinies to available resources and the use of more appropriate and

relevant technologies in agriculture, health, education, and industry. Programs to improve health services to people in the developing world are now receiving increased attention since those same people are essential for development in the world of today. In some cases, development may be equated with treading water to keep one's head above the surface. Nevertheless, as primary health care emerges as a tool for development, it should also be viewed for its potential role as a tactic or strategy for desired social change by concerned governments. Primary health care services are the first level of action by a country's health services to solve a health problem confronting an individual or a community (8).

In many countries, economic planners have not given high priority to health. There are many reasons for this low status of health in socioeconomic development. Major reasons are the absence of well-formulated health plans of broad scope, a dearth of coordination within the health sector itself, and the failure of health professionals to coordinate their activities with other activities designed to promote development (9). In most instances, this failure has resulted from difficulty in acquiring satisfactory data, a lack of comparability of input/output measurements, and the absence of reliable indicators upon which analysts in different fields could agree. It is hopeless to develop accurate measures of an amoeba's constantly moving and reforming pseudopod edges. In *The Lives of a Cell*, Lewis Thomas describes how nontechnology health care (supportive), halfway-technology health care (post-incapacitating), and decisive-technology health care (immunizations and other effective antibiotic and chemotherapeutic measures) bewilderingly defy measurement of quantity and quality (10). It is difficult for the health economist to develop adequate tools for accurate cost-benefit analyses useful to action-oriented program planners. Health planners, who may themselves be health professionals, similarly bemoan the paucity of measurement devices, reliable data, and accurate planning and projection machinery. Health, as a "soft" field because of complex and overlapping variables, does not lend itself easily to "hard" analysis. Health planners thus have continuously lost out to the hard data planners who can forecast with much more

apparent accuracy for the financial and political decision makers who control development. It must be recognized that development networking cannot always produce clear-cut, readily measurable outputs. But as a variable in development network plans, health contributes significantly to process and outcome.

For many years Western economists have viewed health as a "consumption" expenditure rather than a "productive" investment. Economists in the People's Republic of China insist on the converse: Ill health results in economic costs to society (11). A Colombian study estimated that 5% of the total number of days of work annually are lost for health reasons (12). A World Bank study among Indonesian workers reported that 85% of the studied population had hookworm and 45% suffered from iron-deficiency anemia. Sixty days of treatment with iron supplement increased productivity by 19% at a cost of U.S.\$0.13 per person in this study; the calculated benefit/cost ratio was 280:1 (13). In a study of tuberculosis control in Korea, it was estimated that U.S.\$150 would accrue to the nation for every U.S.\$1 spent in an optimal control program (14). Although there have been numerous descriptions of the economic effects of diseases such as malaria, few additional studies have analyzed cost/benefits of health programs to overall development (15, 16, 17, 18). Fewer studies have related the delivery of health services to economic productivity. From a holistic viewpoint, however, the impact of health on economic development is undeniably immense. Malenbaum's study of health and productivity in South America, Mexico, and India, the study on parasitic diseases in St. Lucia, and the study of the economic impact of schistosomiasis in the People's Republic of China are all disease-oriented (19, 20, 21). Not usually taken into account by such studies are the nonexotic host/parasite interactions and other barriers to well-being: for example, trauma, "minor" infectious diseases, lack of available contraceptive and perinatal services, and general lack of access to primary health services.

It is difficult to conceptualize a direct relationship between health services and productivity. Professor Teh-wei Hu, an economist, in reviewing the People's Republic of China's development

experience, doubts that there is time to make an acceptable study of the relationship before causal relationships occurring in both directions invalidate the data. Recognizing the limits of available data, Professor Hu attempted to determine the economic benefits expected to result from the improved health services seen in the People's Republic of China. He expected to find: (1) reduction of working days lost to illness, (2) improved productivity due to improvement in the health of the labor force, (3) savings of time previously spent in traveling and waiting for treatment—yielding more time available for production, and (4) a decrease in mortality rate resulting in increased longevity in the labor force. Recognizing his shaky data base and wanting to suggest rather than define limits of study, Professor Hu has pointed the way to analyzing the impact of variables in development networks as they relate to health services. His microdata reveal concrete examples of increased agricultural productivity due to improved primary health care services. On the other hand, analysis of his macrodata indicates that barefoot doctor services may have a positive but not statistically significant impact on productivity. In considering both consumption and investment benefits, Professor Hu concludes that the health manpower training and distribution strategies chosen by the PRC are both economical and effective (22).

It does not have to be proved repetitively by cost/benefit studies which are difficult to perform that a patient horizontal with the fever and weakness of malaria, pneumonia, or tuberculosis is less productive than his healthy vertical counterpart whose mental and physical attitude bespeak potential contribution to a country's development.

Another area requiring comment is population growth. Some nations need and desire more people. More populous countries recognize the need to curb people proliferation. Without a primary health care delivery system with a nationwide infrastructure of primary health care service providers reaching the most peripheral villagers of a nation with integrated services (including long-term family planning services), there is little hope for a sustained and meaningful population growth retardation effort that will outlive

an initial burst of enthusiasm and funding (23, 24). Population growth is inextricably tied in with multiple strands of the socioeconomic development network; local health services play prominent roles in preventing or, if desired, promoting births. There is evidence that people will desire fewer births if their country's child mortality rates are reduced (25). They know their children have a better chance to survive so they do not procreate as extensively to compensate for a high infant mortality rate.

Perhaps defying explanation, but reflecting the complexity of the network concept of development, is a related phenomenon that concerns substantive health indices. Among the twenty-seven richest countries of the world three significant indicators of well-being usually can be seen: a life expectancy at birth of sixty years or more, a death rate of eleven per thousand or less, and an infant mortality rate of sixty per thousand live births or less. Most of the ninety poorest countries (measured by GNP) rank unfavorably with respect to these indicators. Of these ninety poorest countries only China, Cuba, Grenada, South Korea, Sri Lanka, and Taiwan can meet the health standards set by the richer countries according to these indicators. Interestingly, the Indian state of Kerala (in stark contrast to the rest of India) shares with them those health standards described above as characterizing the twenty-seven richest nations. Nutrition undoubtedly plays an important role since the six poor countries attaining these standards have average daily caloric intakes above 2,000 (although Kerala's caloric intake is significantly lower). Education, too, is a critical component in the developmental mix; yet China's literacy rate (1973) was one-third the level of that of the other five countries (26, 27). What is intriguing about all of this is that two development threads are woven in common through the twenty-seven richest countries as well as the six poor countries (and Kerala). One is extensive health service systems with some kind of primary health care service provider accessible to most of the population. The other is a birth rate per thousand population below thirty-two. Primary health care services are known to be extensive in the seven poor settings and undoubtedly play a significant role in stabilizing their populations' growth.

Primary health care services can play an additional role in improving the nutritional level of a nation's people. Agriculturalists and nutritionists, whose major concerns are with production technology on one hand and the effects of food on the individual on the other, have not given enough attention to the connection between the two terminal points. This connection is the food distribution system and its management. The most nutritious of sufficiently available foodstuffs frequently fails to reach poor people in developing countries because of the absence of an effective distribution infrastructure. Concerned with nutrition as a part of primary health care, the health workers described in the following chapters can be part of the permanent peripheral manpower infrastructure needed for food and other health-related distribution programs initiated by governments.

Health will continue to gain prominence in developmental planning. Expectations for national growth are built upon reasonably healthy and productive people moving towards increased local and national self-reliance. Whereas many previous national health policies were only tangentially concerned with quality-of-life issues, developing countries are now actively promoting health and well-being as necessary to their development network strategy.

A superficial look at history shows that some successful developing societies have used health as an instrument of stability as well as development. When extensive health services are provided, the population appreciates the interest in them shown by their government; they become aware that their government cares about them since it provides the most personal of services (even if only the most basic services are provided). Often a government's initial contact with its people is through a health program. The Russian Empire began using health to strengthen stability and development in the nineteenth century when *zemstvos* (the local district assemblies) promoted the use of feldshers to provide health services for the peasants (28). China's meteoric evolution of a development network to solve some of the most complex nation-building problems ever confronted by any society has helped to thrust health into the

foreground as a major tool for development (29). The lessons of the Chinese experience are often casually examined, then blindly adopted, discarded, or misunderstood. Yet related lessons are to be learned in one way or another from experiences in places such as Scandinavia (low-cost high-quality care to all) and Tanzania (efforts to provide total coverage). Adequate coverage with cost containment is not only desired; it is necessary and possible if health is approached as an integral part of development networks.

As a labor-intensive activity, the expansion of primary health services will provide jobs. The bulk of these jobs will be in the rural sector where three-fourths of the developing world's population reside. Improved coverage with primary health care services will also contribute to attempts to reduce urban migration. It is important in planning primary health services not to ignore the needs of the urban and peri-urban populations in developing countries since proportionately they use primary health care services much more than do rural populations (30). Peri-urban populations in particular present the special characteristics of being people in transition, surrounded by changes, and probably more amenable to new ways of doing things. They are an important target group for receiving primary health care services from workers in this new mid-level and basic-level health technology. Through positive and helpful encounters with mid-level and community health workers, they can be the first to take word of innovations back to villages since they have not seriously severed lines of communication with their rural roots. However, because the urban and peri-urban populations account for only about a quarter of the developing world's population, the major effort to use health as an agent for change and development should have a rural emphasis.

There are many other facets in establishing health as part of a strategy for development. It can be a useful model for other developmental thrusts, especially those that require village investment behavior. Village investment behavior is the degree to which villagers invest their own resources (time, energy, money) in opportunities for economic, social, and political improvements.

The advantage of economic growth and other forms of approach-

ing well-being is not necessarily that happiness is the result; rather it is that such development increases the range of human choice (31). Human choice implies adequate opportunities, capabilities, and motivations for individuals to invest their resources in their own improvement. The village investment models by Krug, Schwarz, and Bhakdi may be useful in further understanding the role health may play in development. When slightly paraphrased, they describe:

1. Villages that are high both in opportunities for investment and in resources available for investment as exemplars of the state of affairs that development programs should try to achieve. They will sustain a continuing rapid pace of development with little or no government involvement.
2. Villages lower in opportunities than in resources for investment as prime targets for opportunity-creating technical cooperation: roads, irrigation systems, job opportunities, credit, and other hard inputs.
3. Villages lower in resources than in opportunities for investment as targets for softer inputs that try to energize developmental efforts such as training, community organization, or information programs.
4. Villages low on both opportunities and resources for investment as requiring a combination of opportunity-creating and capability-creating inputs (32).

Village types 3 and 4 are the most frequently existing types in the developing world. They represent the "grassroots" waiting to be helped by a technically competent central government. Organizing health-related community development activities (capability creating) and training primary health workers (opportunity creating) are investment opportunities perceived to yield high returns if villagers have confidence in the system. They represent an opportunity for central governments to enlist the populace in the nation-building network.

Relating the gospel of growth described by Chopra to today's altered needs, the time appears opportune for bi-directional socio-economic development (33). Training and the provision of primary preventive, promotive, and curative health services can constitute an entry point for the development of human resources which are

in turn basic to the development of natural resources. It should be borne in mind that *it is critical to link government to local communities by intermediate-level workers* who serve as facilitators/teachers/supervisors/managers. In many technical fields, these mid-level workers are the bulwark of a successful system that is to survive. The role of the mid-level worker in health is discussed in detail in the next chapter.

In the following chapters, an approach is presented for using health as a development strategy characterized by the establishment of central-peripheral-central linkages and adaptation of appropriate and relevant technologies. This approach supports the theory of UNICEF's prescription for providing basic services to improve the well-being of populations in the Third World (34). It has enhanced the concept already with a similar theoretical model that is adaptable, applied it on a national level in diverse settings, and demonstrated that it can be practically implemented on a large scale.

The design approach to rapidly expanding health service coverage described in this book requires governments to make a relatively low initial investment in less expensive and more appropriate technology. It also reduces the need for external technical assistance once the program is fully operational since it increases the technical capability of the developing country shortly after implementation. The approach is characterized by a three-tiered system: health professionals, mid-level workers, and village (community) health workers. The mid-level worker in this concept bridges the social and technical gap between central government health operations and community needs. A multiplier effect for rapid expansion of geographic coverage is provided by a supervisory and training interlock, with the intermediate-level workers playing the key connecting role.

The most peripheral and most numerous deliverers of services at the community level can be self-sufficient if a government wants and plans for sustained self-reliance. The approach thus promotes building a nation-wide delivery system that requires minimal recurrent costs to governments. Advocating the development of a permanent infrastructure with required support mechanisms, the fol-

lowing chapters describe concomitant self-sustaining institution building and the opportunity to strengthen management capabilities. Further, this approach to building and strengthening the delivery system maximally involves the people it serves in the process.

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CHAPTER 2

**Designing an Appropriate  
Approach to Improved  
Health Service Coverage**

*Richard A. Smith*

The relationship between health and development has been described for many years but it has not been until recently that the opportunity has been created for concerted action on a large scale to amalgamate the two (1). One of the significant steps in this direction has been recognition by WHO/UNICEF that in the interaction between development and health programs, primary health care should be considered integral to overall rural development (2). Modeling their health programs on those of developed countries has failed as a strategy for developing countries to provide adequately for the basic needs of underprivileged populations. It was hoped that highly qualified personnel working within sophisticated health services would progressively expand resources peripherally until the entire population was covered. This has not happened. Instead, the services remain predominately curative and oriented mostly towards a small segment of urban populations. Thus, the majority of the populations are without access to these services.

At the February 1975 meeting of the UNICEF-WHO Joint Committee on Health Policy, it was recommended that the two international organizations seek ways to extend primary health care

to underprivileged populations in developing countries (3). Thus, the director general of the World Health Organization globally stimulated a movement to develop expanded primary health care coverage. In 1976 the World Health Assembly endorsed the joint recommendation, giving further impetus and direction to the primary health care movement which over the the past few years has been making its way slowly into the corridors of developmental planners (4).

There have been numerous descriptions of efforts to provide primary or basic health services to various segments of populations. Only a few have succeeded in providing total country coverage in this century. The sociopolitical systems of these successful countries have lent support and credibility to the practice of having primary health care services linked to rural development. Most efforts, however, have been small undertakings that started as demonstration programs and have thus: (1) been highly successful locally, (2) continued operating as demonstrations without significant impact, or (3) disappeared without much publicity. The programs that have been documented by the WHO/UNICEF Joint Study, WHO's *Health by the People*, Fendall, Rosinski, et al., give a series of descriptions of country programs that appear to be successful. Although many of them are demonstration programs, their planning, integration, training, and deployment methodologies have been diverse and encouraging (2, 5, 6, 7, 8, 9, 10).

However, it has not been until the recent thrust of providing community-level primary health care services that thought has been given to examining this myriad of international experiences for the purpose of making some practical use of their sums. It is one thing for a developing country to know that there is a wealth of information and experience available to it to help solve the problems of health services at the village level. It is another matter for it to glean useful and relevant information and technology from a variety of disparate sources and to initiate the application of relevant knowledge in its own setting. The information is scattered in many planning documents and hundreds of articles and books published on

health development subjects, which often are not available to those who could utilize the information.

Searching the literature prior to 1973, no plan was found for organizing an "approach" to the problems of primary health care that was: (1) capable of serving as a coherent approach to developmental strategies for health planning, (2) universal in its basic considerations, which are common to some extent in most settings, (3) broad enough to consider the major common obstacles or problems, yet flexible enough to be adaptable to the needs of specific settings, (4) designed to include a starting point and an initiation technology to carry the plan into its implementation phase, and (5) capable of producing a program that is country-specific and replicable country-wide.

In 1974, a group was formed at the University of Hawaii to begin developing such an approach that could be used as a flexible and adaptable design framework with which to expand primary health care programs peripherally to the community level. Once developed, this design approach could be shared with countries desirous of improving rural health services. Those countries could then adapt whatever elements of the approach they considered appropriate for their needs and discard whatever they considered irrelevant. In this way, a flexible planning method based upon the combined experiences of numerous nations could be adapted to a local situation and then placed into the perspective of a locally appropriate operational framework (11).

The design approach that has been developed makes six important assumptions about primary health care systems. The first of these is that *primary health care services must be integral to rural development*. In some instances (especially coordinated with agriculture, environmental engineering, education), health may be the initiating connector of the community to the larger system.

The second assumption recognizes that radical reorganization of health services is not feasible in most countries; yet there may be need for reorganization in some. Also, it recognizes that there has to be adequate funding for improved and expanded health services.

Initially this is a politico-economic concern; subsequently it must be handled at the periphery, at the village level. Yet neither of these considerations (radical reorganization or financing) deals with the fundamental issue: Who is going to provide the services? Thus, *the broad-based foundation for a primary health care system is a variety of appropriately trained and deployed persons to deliver services integrated at the community level.* We are therefore preparing for a new type of health practitioner who appropriately bridges modern medicine and today's pressing needs at the local level.

Organizational change and adequate financing are vehicles that must be set in motion to effect long-range change. However, *development and deployment of appropriate manpower can be the most effective means to initiate change in the health system* since it can be on-site with a minimum of high-level disruption of government (organizational changes) and a minimum outlay of government funds (public, private, bilateral, and international donors should be willing to fund initial stages). An important aspect of this third assumption is that health manpower trained by newer, nontraditional methods can be rapidly deployed. The appearance of service-delivering health personnel in villages shortly after a program begins stimulates confidence that the system works. It also engenders grassroots support for expansion and accompanying alterations in the organizational framework that supports health services.

The fourth assumption is that *the community health program must be connected to the next larger governmental structure if a primary health care program is to survive* beyond its initiation: the village program must be connected → to the district → province → region → national level.

The fifth assumption results from the experience of programs that have tried to train village health workers without developing an intermediate cadre to connect the community (most peripheral) workers to the larger health system (central). With rare exception, such programs have failed to be replicated nationally\* (12). Thus,

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\*Also rare are reports of such failures.

*an intermediate-level health worker (medical assistant type) is essential in a system delivering primary health care services.* This intermediate role connects the peripheral health worker to the presently established larger system so as to: (1) promote national acceptance by professionals and others, and (2) provide mechanisms for training, supervision, management, and patient referral.

The sixth and final assumption is related to the confidence most people have in the technical skills of doctors. Our experience to date indicates that if nondoctor providers of health services are taught on a scientifically sound basis, using the same (albeit abbreviated) logic to define and manage problems that doctors use, and if doctors can have significant input into program policy, training, supervision, and referral processes, then *the medical profession will more readily support a system that in effect extends their professional capacities into rural areas.* A program to extend the doctors' capacities instead of substituting for them is not perceived as being fraught with all the dangers to the public of a practitioner totally outside a scientifically based health care system. A program of extending doctors' capacities through medical practitioners trained to less sophisticated levels also does not pose the kind of economic threat to doctors that is produced by someone outside a "doctor controlled" system. In countries with few doctors, there will not be a clear line of demarcation between the extending and substituting roles. This should not pose insurmountable problems.

Thus, the concept of an extension of the doctor at the intermediate (district) level as well as at the community (village) level is one that logically can be used to improve and expand primary health care services with the technical and political support of a country's medical establishment. The term *doctor extender* translated into French (*une extension du médecin*) yields a shorter word: MEDEX. MEDEX, a contraction of "doctor extender" in other Latin-derived languages as well, is a term with which to describe a new approach to extending medical and other health service coverage.

Part of the problem that has resulted in inadequate health service coverage at the village level of developing countries stems from an

excessive concern with the training of Western-style medical manpower rather than with the delivery of appropriate health services. To deliver culturally effective and efficient primary health care services, a systematic approach to health service planning is desirable, one that examines the jobs of the health system and the constraints within which the system must work, and then determines the functional roles of health workers. To put it another way, if one is planning production of the most sophisticated and highest-level medical manpower, one would concentrate on training doctors. On the other hand, if one is planning production of the most appropriate health services, which are to be accessible to the largest number of people, a less complex approach suffices.

This approach must be concerned primarily with developing a system that determines the tasks that need to be performed to meet the most pressing health needs of a country and its communities. Fülöp's superb discussion of the integrated development of health services and health manpower provides an in-depth analysis of the scenario with which such a system can be conceived (13). Then a decision must be made regarding the most realistic and efficient method of performing the necessary tasks and delivering related services. Nowhere is this put into better perspective than in Flahault's *WHO Chronicle* article on health team development (14).

Using the concept of the doctor extender as a relatively non-threatening entree into the health sector of development, the Health Manpower Development Staff (HMDS) at the University of Hawaii further developed the MEDEX approach to delivering primary health care services for potential cooperation with other countries. Funding the HMDS through the U.S. Department of Health, Education and Welfare, the U.S. Agency for International Development sought to develop expertise for designing and implementing programs of primary health care services in developing countries. In addition, HMDS began developing a new training technology consisting of adaptable prototypes for country-specific teaching modules that would allow rapid and efficient training of nondoctor providers of health services (15). Thereafter, a functional analysis of the providers of primary health services was needed in

order to refine the MEDEX approach for broad adaptability in specific countries. At the Manila Asia Foundation Conference in 1975, a member of the Health Manpower Development Staff gave a functional description of doctors and their extenders (16).

### **Functional Role of Doctors**

The functional role of doctors in rural primary health care should be twofold. One role is solving medical problems that cannot be solved by less trained persons. This means that the doctor should be reserved for those medical problems referred to him by other workers. When a highly trained resource—such as doctors—is in short supply, the planner should reserve physicians for those difficult cases that cannot be handled by less trained people. The other role for rural-based doctors is management and supervision of the health care system for a reasonably large geographical area. This will require retraining doctors in health planning, epidemiology, operations management, and evaluation.

### **Functional Role of the Intermediate-level Doctor Extender (medex\*)**

The traditional role of the “medical assistant” was to have curative primary care responsibility for the common problems of his or her population. What the medex cannot diagnose and treat is referred to the physician. In addition to these curative responsibilities, the medex should be responsible for mid-level management of service units serving populations of five thousand to ten thousand persons. Within this responsibility is disease surveillance of the assigned geographic areas, organization and supervision of the preventive/educative activities for the geographic area, training of community health workers to implement the preventive/educative tasks, and general management of the health facility. To accomplish this

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\*Because it is less cumbersome, *medex* (in lower case letters) is used in this book as a *generic* term to describe the key intermediate- or mid-level doctor extenders. MEDEX (in all capital letters) refers to the approach of extending medical and health service coverage (see glossary).

work, the medex needs skills in curative medicine, preventive and promotive medicine, communication, community organization, and educational techniques.\* He also needs mid-level management skills such as planning for small service units, principles of supervision, personnel management, operation of small service units, evaluation of results, and report writing. In some countries, selected nurses could be further trained to provide a strong start to a new manpower thrust (16).

If there are nurses available for this intermediate-level practitioner role, they may be ideally suited for the additional training. In many instances, nurses may already be performing some of the tasks in this category—with the responsibility, but without the training and necessary backup support. In the early stages of a program, nurse practitioners (medex) also may be the most appropriate people to train for this job in order to convey the image of competence as well as its substance, thereby increasing public confidence. This is especially true at the supervisory level. Care must be taken to preserve the role and functions of the discipline of nursing as some nurses move into this new field.

Most countries in the developing world do not have sufficient numbers of nurses to be used in this way. Therefore, the training methodology and support system should be geared to accommodate the background of whatever trainees are locally available, whether or not they have had previous health-related training.

The direct change-inducing role of the medex is limited. These doctor extenders are more highly educated and come from a different social background than most villagers. It is often difficult for them to be comfortable with and to be trusted by rural villagers. Even though the social gap has been narrowed from the wide doctor-villager gap, social distance may still exist between the medex and the villager.

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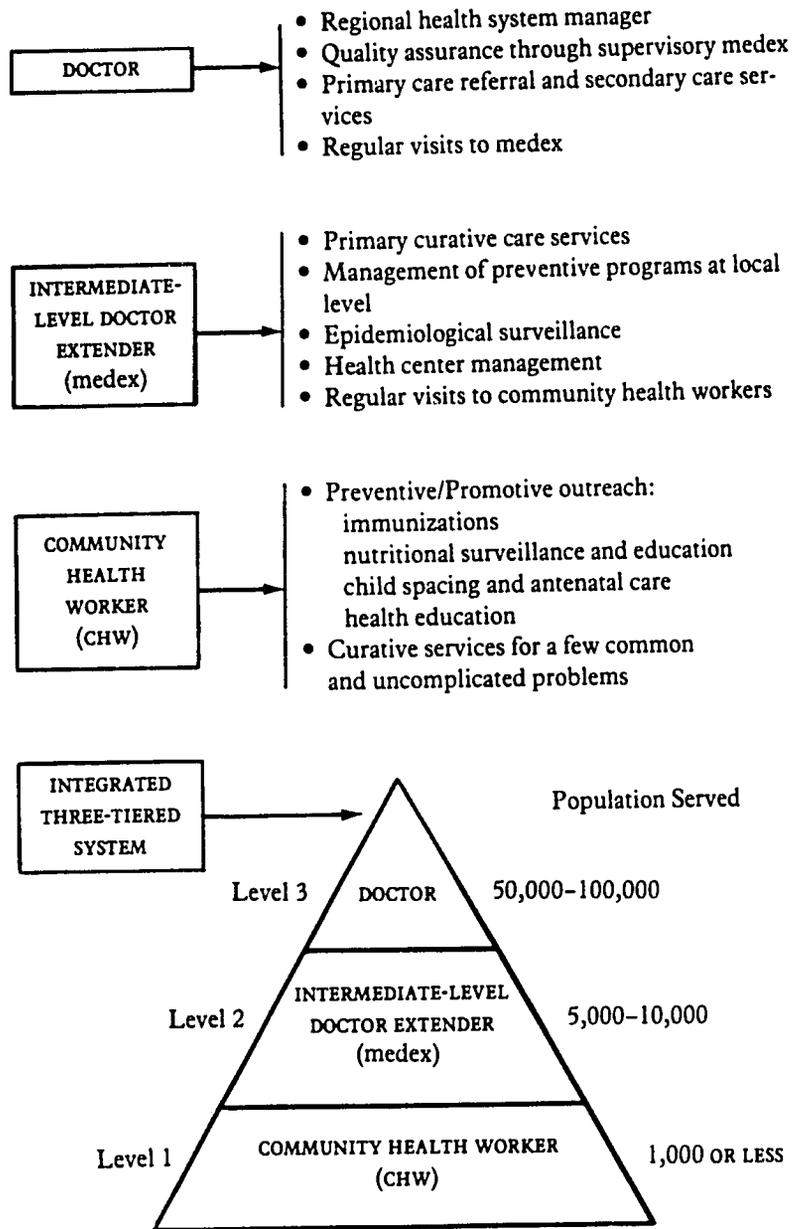
\*Using comparable modular training technology with which they themselves were trained, medex can train community health workers, thereby geometrically increasing the number of workers to expand services rapidly. This multiplier effect has been accomplished in the MEDEX program in Micronesia (15).

### **Functional Role of the Community Health Worker (CHW) or Village-level Doctor Extender**

The role of the community-level doctor extender is quite different. These front-line personnel are, as Daniel Flahault has stated, "agents of social change" (17). To do their jobs, community health workers should exist in such numbers that each can serve a population of one thousand or less. The primary responsibilities of the CHW lie in preventive and promotive services (the role of the change agent), in limited curative services, and in integration of these services. The change-agent role is enhanced if the background of the CHW is similar to the villagers. In fact, community people themselves should be trained as these basic health workers. Community people, selected by local inhabitants in most cases, identify themselves as members of the community rather than of the health system. Their curative training need give them only enough clinical information and skills so that they have credibility in preventive and promotive health matters. Community health workers can learn more about health as they work with the medex. More important, they should be extensively versed in communication and organizational skills. *It is important not to overtrain these people or they will tend to leave the village environment.*

Thus, the CHW is what might be called a "boundary spanner" between the health care delivery system and the village social system. Their role as boundary spanner is to bridge the gap between the health system and the village social system. Their tools are the communication and organizational techniques used to foster community development. A job description of the duties of a CHW should include translation of the knowledge and skills of health professionals to the community in such a way that the community can understand and feel comfortable with the possibilities of change. Recognized as part of the village, the CHW can be most effective in this role since social distance between provider and consumer of services is minimal (16). To summarize, the manpower configuration for rural primary health care services can be visualized as having three levels or tiers as shown in figure 1.

Figure 1. Description of jobs.



The first level of care is the CHW for a "community" of one thousand or fewer people. Community health workers at this level promote health and provide well-focused preventive and curative services. These basic services, needed predominately in rural areas, may have to be provided in nonrural communities under some circumstances.

The second level of care is provided by intermediate-level doctor extenders (medex). Their main functions are to offer primary preventive and curative services for a population of five thousand to ten thousand and to plan the programs implemented by the CHWs under their supervision. Medex should be given responsibility for maintaining and improving the health of his or her geographical area. This responsibility also includes providing care for people referred by CHWs.

The third level of rural primary health care services is provided by the doctor. The role of the doctor is to see patients referred by the medex. More important, regional health system management for fifty thousand to one hundred thousand people is the doctor's job where this is appropriate.

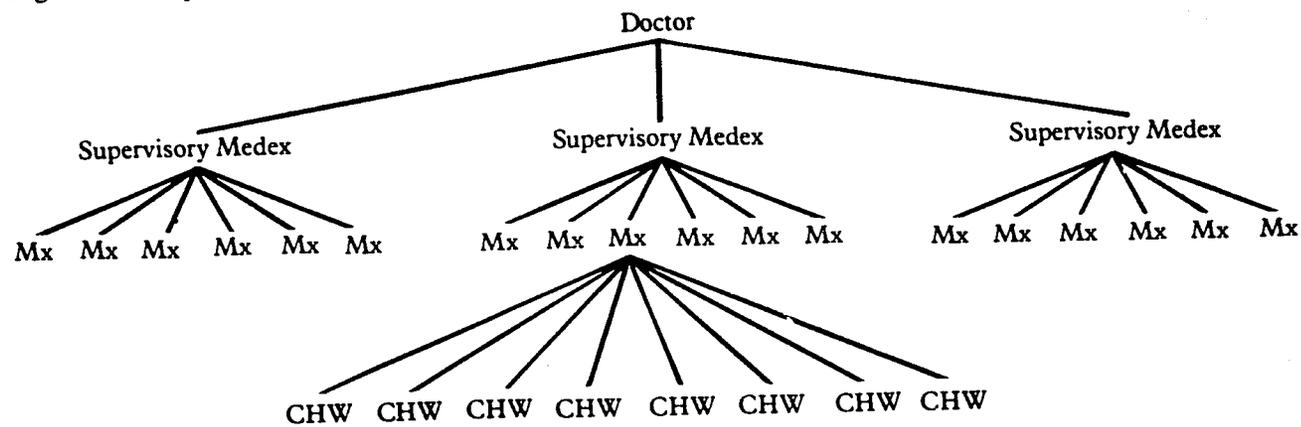
The doctor must plan, implement, and evaluate the health services that fall under his supervision. He must be *linked* to the community health workers by the medex. And it is this central-to-peripheral and peripheral-to-central linkage, operating in both directions, that makes this approach plausible, logical, acceptable, and workable at this time in many countries.\*

The result of this three-tiered primary care system is that one doctor can have 21 to 150 workers on his health provider team. In this way, health care is expanded and multiplied many times (figure 2).

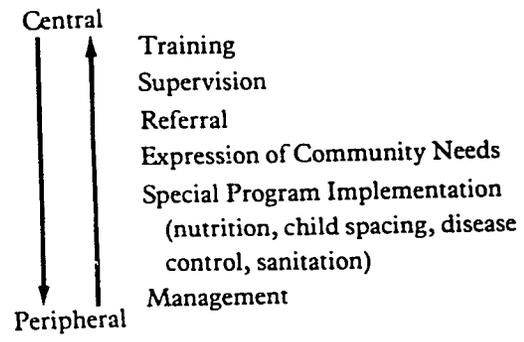
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\*It should be noted that *barefoot doctors*, operating at the CHW level in the People's Republic of China, have a strong intermediary and referral system to support them. In many communes, there is a financial incentive used to encourage utilization of the most peripheral level (CHW) first.

Figure 2. Manpower infrastructure of a primary health care system.



Bi-directional interaction  
between levels within  
manpower infrastructure



### **Avoiding Problems in the Development and Use of Doctor Extenders**

Promoting the use and maintaining the quality of primary health care workers is not easy. The Health Manpower Development Staff at the University of Hawaii has analyzed the experiences of twelve countries and combined this analysis with its own experience in five additional countries. The HMDS found seven basic problem areas that need critical attention in implementing and maintaining programs for primary health care using doctor extenders. These problems, common to most programs, represent the major areas that should command attention and resources in this approach to developing primary health care systems.

First, a BROAD BASE OF SUPPORT is exceedingly important for bringing together government policymakers, training institutions, organized medicine, practicing doctors, and others with vested interests in health care as part of the planning process. Together, they will offer the protective backing needed for the programs to sustain themselves.

Second, a RECEPTIVE FRAMEWORK within which the new workers can work must be developed. It is important to secure adequate pay and a new place in the personnel structure of the existing health system for the doctor extender. It is exceedingly important to give medex and CHWs an image that does not connote inferiority. Imagery is critical in the initial stages of such a program and should receive extremely heavy emphasis. There will be role dissatisfaction unless the image of these personnel is positive, firmly established, and widely known. To prevent negative social and cost benefits, upward mobility should be designed only for movement within these new categories. Advancement to the full-fledged doctor level should be discouraged save for the truly exceptional, educationally prepared, and gifted practitioner. Adequate attention paid to this facet of the operating framework will greatly strengthen the development of a new orientation of health services towards the community. The community should be involved in selecting can-

didates for training and in the planning process for the development of community health services. To prevent the community from feeling that they are getting "second class" care, some doctor extenders should work at the regional hospital outpatient department and at the rural primary care referral center so that rural people will recognize that they are getting similarly appropriate care near their home. To aid this process, the doctor extender could have a distinctive uniform as well as a special title in countries where these are considered important.

Third, there must be INVOLVEMENT OF DOCTORS in developing the curriculum and in the teaching of curative care activities. Doctors must be involved because they feel and express responsibility for the quality of medical care practiced in their country. If doctors design and help implement the training and then help supervise the workers (directly or indirectly), they will become strong supporters of the doctor extender concept. The question of professional excellence is one we have been asked on numerous occasions. Is quality of health care services sacrificed when people who spend less time in training than doctors become providers of health services? In answering this question we have placed it in the context of two related phenomena that are becoming obvious to health planners in developing countries. One of these is that the quality of nonexistent services can only be zero. If accessibility is nil, quality becomes a moot question. (We take into consideration services being rendered by traditional healers and other health-related community entrepreneurs, but we place them outside the category of scientifically trained service providers.) Also, professional excellence is a goal to be strived for by any country. However, a social question that needs to be answered is whether professional excellence in the care of a few should take precedence over and exclude a different level of quality of care (basic/primary health care services) for the many. If health professionals do not attempt to find ways to implement programs of primary health care for the majority of their nations' populations, the people through their governments inevitably will make such decisions for them. It is towards preserving the constantly improving competence of the health field, strengthening the

leadership capability of the health professions, increasing efficiency through opportunities to delegate simple health tasks to people trained at a less sophisticated level (and thus allowing doctors opportunities to handle the more complex medical tasks and health decisions) that this approach is directed.

Fourth, these health personnel should be prepared for their jobs by COMPETENCY-BASED TRAINING which is problem-oriented so that irrelevant knowledge is omitted from the curriculum. If this is done, the students are trained at low cost and in the shortest possible time. The training should be in rural areas if possible and trainers should have rural experience in both preventive and curative care. It is critical that attention be paid to communication and organizational skills.

The Health Manpower Development Staff has developed a set of prototype modules that can be adapted to the specific needs of individual countries for training intermediate-level and community health workers. These modules constitute a competency-based curriculum that covers a relatively well focused content area and yet allows curricular flexibility. There are additional advantages to this approach: new curricular elements can be added or deleted with ease; achieved competence is easier to test; the modules can combine a variety of educational methods and activities; the modular approach can be used for continuing education; with specially prepared modules, medex trained by the modular system can train more peripheral workers (CHWs), thereby creating a multiplier effect. If handled adroitly, this multiplier effect can be used to provide primary health service coverage to the majority of a country's population in a relatively brief time. With this approach, doctors supervise and initially train medex. The medex, in turn, train and supervise community health workers, using a modular format that is similar to—but less sophisticated than—the modules used to train medex. This system provides a unique training and supervisory interlock. This interlock and the resulting multiplier effect reduces the need for large centralized training institutions and conserves other scarce resources.

Unlike doctors and nurses in developing countries, who are usu-

ally trained to a universally accepted standard, medex and CHWs are country-specific. The out-migration or "brain drain" of these categories of workers therefore will be minimal.

Fifth, to develop medex and CHWs without a DEPLOYMENT SYSTEM is a major reason for the failure of many programs that train health workers. In most instances, CHWs should be selected by and from the communities they are to serve. Where feasible, this should apply to medex as well. In any case, each medex should be destined for an area of serious need even before he is trained. He should not be trained and allowed to settle in a comfortable and desirable location where usually there is less need for his skills. Where he will work following training should be predetermined, and no effort should be spared to assure that he is assigned to the predetermined location. Otherwise programs such as these will have little long-term effect. In addition, if government priorities are not fully committed to providing adequate supplies, equipment, and managerial personnel for rural health, one might as well not train these people. There has to be adequate and ongoing supervision of health manpower. There has to be adequate pay. Workers have to have adequate housing. Otherwise personnel will offer only curative care services (since villagers reward this behavior), or they will migrate to urban areas. In other words, the medex and CHW must have *incentives* to do a good job. These incentives, particularly for the community health worker, are different in each culture and must be individualized.

Sixth, a CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT PROGRAM must be implemented. If workers are not supervised, and if performance weaknesses are not identified and corrected, their skills decay. Socially and educationally isolated in harsh rural environments, these exceedingly important contributors to development need to be satisfied in their jobs to be effective. They should not be deployed and forgotten. Attention to personal needs and desires for increasing skills should be recognized and fulfilled.

The seventh basic problem area is an EVALUATION AND HEALTH INFORMATION FEEDBACK SYSTEM. This system should provide timely and accurate information on all aspects of planning, training,

deployment, and program management, with critical attention being paid to political as well as operational issues.

These seven problem areas have become the basic elements or steps in a productive approach to improved health service coverage. They are areas to be considered following delineation of the services needed to initiate or strengthen a primary health care system using appropriate manpower as its action thrust. Initiating or strengthening primary health care systems with this doctor extender approach (MEDEX) has an added advantage: it can be quickly implemented and integrated into an already functioning health system (18).

### **Making Primary Health Care Systems Work**

The development of training modules to train community health workers is a natural consequence of developing modules for intermediate-level doctor extenders. An additional area which is becoming increasingly recognized as critical is the adhesive that holds primary health care systems together: management competence. If there is one single area of health program operation that has received inadequate attention in the past, it is management.

The administrative aspects of health program planning and implementation—including the training, deployment, and logistical support of health manpower, and personnel supervision—are the instruments of success in primary health care. Lessons from the successes and failures of others are not difficult to find if one looks beyond the technical preparation for and delivery of the health services themselves. Thus, one sees that the keys to successful program implementation, operation, and replication lie in management competence. And at the heart of developing peripheral health services is mid-level management (19). It is for this reason that developing mid-level management skills as part of expanded peripheral health services has become an integral part of the Health Manpower Development Staff's approach to improving primary health care services. Future publications by the HMDS will emphasize in detail the realities of practical program management in developing countries.

Consultations in 1975, 1976, and 1977 by the Health Manpower Development Staff with the World Health Organization, other international and bilateral aid organizations, and ministries of health in Asia, Africa, and South America have indicated that training and deployment of new kinds of health manpower are going to be important parts of the evolution of health care systems over the next few decades. It has thus become apparent that a worldwide interest in primary health care will promote the use of adaptable technology and technical cooperation specifically geared toward this movement (20).

The success of the MEDEX approach in expanding health services in thirty-four states in the United States of America (21, 22, 23), in Micronesia (24, 25), and in Thailand (26, 27); and the design of primary health care systems based upon the MEDEX approach in Pakistan, Lesotho, and Guyana have provided the University of Hawaii with an extensive background. At hand is recognized competence in the design of health systems and in health manpower development. The HMDS has laid the foundation for an identifiable, tangible, and adaptable approach to improving rural primary health care. This approach has been developed after gleaning information from numerous countries about their experiences with various types of health service delivery. It has been field tested at both ends of the socioeconomic developmental spectrum. Countries involved with health system design, manpower training, and program implementation no longer have to refer to an amorphous maze of literature from which each nation's health planners must determine what various pieces of information are most appropriate for their particular setting. It is recognized that there is not "one" way to solve the problem nor is there a "system" that can be imported from abroad. However, the major obstacles to success have been defined and categorized, and articulation of the problem areas is being used as a guide for program implementation in an increasing number of countries.

An adaptable design approach to primary health care as described herein holds promise of producing peripheral health

workers and a support system for the resulting expanded health service infrastructure. Without these, significant primary health care and successful long-term special or vertical programs—for example, nutrition, population increase or decrease, communicable disease control, environmental sanitation—will remain elusive. Stressing strengthened planning and management competence, the basic tenets of the approach that has been described also prepares a nation for strengthened reliance on self-sustaining institutions it has built itself and on its other resources to meet its own needs for health service coverage.

The Health Manpower Development Staff at the University of Hawaii is available for cooperation with countries desirous of expanding or improving their primary health care systems. This resource is available to individual governments, bilateral aid agencies, and international organizations as this emerging field grows in prominence.

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### CHAPTER 3

## **Planning for the Pragmatist**

*Archie McPherson and Rodney N. Powell*

Successful community development planning that has resulted in large scale success has not occurred in abundance. When such planning has been successful, there has usually been a substantial reorientation of the social and political system. This reorientation promotes simultaneous networking of multisectoral development. What becomes obvious to those involved in the technical operations of such development are (a) the need to understand the interdependence of the components of the network, (b) the need to involve community people in the planning process, and (c) the need to apply specific technical competence to each of the network components.

Participation of the people in their own development is essential and it is described by numerous developmental planners. Appropriate to this discussion is the rural development planning system described by Socrates Litsios (1), as well as other activities that are underway to enhance community input into the sphere of national development (2).

For practical reasons, however, planning the health component of development for implementation usually requires documentation and projections of health-related phenomena. Therefore, this chapter is devoted to describing the tasks relating to preparation of a

specific document that we have faced along with health planners in developing countries. The document to which we refer is a proposal to obtain political, social, and financial support for a program to improve health service coverage.

In reviewing primary health care programs and planning efforts in different countries, it is clear that no single system or model has universal application. However, such a review does indicate that there is a great deal of commonality in health sector problems and in the general approaches proposed for resolution of these problems.

A summary of the problems facing health planners in much of the developing world is as follows:

1. Frequent absence of a clear national health policy, leaving health planners without clear guidelines for program development.
2. Low priority for health. In the development programs of many countries, health does not receive high priority and health officials must compete for limited financial resources with economically more appealing industrial or agricultural programs.
3. Imbalances within the health sector giving rise to emphasis on:
  - a. Curative rather than preventive/promotive services
  - b. Urban rather than rural coverage
  - c. Hospital care rather than ambulatory care (particularly in allocation of funds)
  - d. Quality rather than quantity of care
  - e. Training of doctors rather than of auxiliary health workers
  - f. Scientific rather than traditional medical practice
4. Shortage and maldistribution of scarce resources.
  - a. Health manpower
    - (i) Seriously inadequate numbers of various types of health workers. The inadequacy is particularly acute for doctors and nurses. Ratios range from one doctor per two thousand persons to one per seventy thousand.
    - (ii) Inappropriate training of health workers for the health

problems and working conditions of rural areas. Also, it is extremely difficult to induce doctors to work in rural areas. It is unlikely that this difficulty will be overcome in the near future barring major social and organizational change in many countries.

(iii) Inadequate definition of roles and delegation of simple tasks to individuals with less but more appropriate training.

(iv) Inadequate utilization of traditional healers and birth attendants in providing care is a serious planning issue in some developing countries.

b. Facilities, equipment, and supplies. The limited capital available for initial purchase of equipment and supplies is a serious impediment to expanding services. This is compounded by supply management problems, including transport and communication difficulties in getting supplies where they are needed. Health system resistance to changes that would improve supply services and lack of capability for equipment maintenance and repair present serious problems in effective operation of health delivery units. These pose planning problems in new program development.

c. Finances. Shortage of funds is a chronic problem for the health service system in most countries and constant vigilance is required to insure that new programs are affordable and that operating funds will be available for such programs.

5. Inadequate population coverage and underutilization of existing systems. Rapid increases in widely dispersed, frequently mobile populations create difficulties in achieving coverage of the population with the desired health services. Underutilization of available facilities is a problem in many areas; causes for this are critical factors in planning if past impediments to utilization of services are to be successfully avoided in developing new programs.

6. Insufficient or ineffective use of health education.

7. Insufficient community participation in program planning and the operating and financing of health services frequently results

in services which a community may not understand, desire, or use. Countries that have improved health services rapidly have paid special attention to community attitudes and participation and have actively sought maximum mass participation.

8. Insufficient educational materials and insufficient numbers of trained tutors frequently hamper development of necessary health manpower and may give rise to inappropriate training for the tasks required. This is particularly characteristic of the training of non-professional primary health care manpower.

9. Inadequate environmental sanitation. This includes unsafe water supply, unsanitary waste disposal, and poor or nonexistent vector control.

Given the foregoing common health system problems, some general guidelines for program development can be made. Again, it is emphasized that no single system or model has universal application. However, based on general principles, broad guidelines can be drafted. Flexibly applied and adapted to specific social, cultural, and political situations in most countries, these guidelines can serve as useful points of departure in planning new primary health care programs that emphasize appropriately trained and deployed non-doctor providers of health services. A plan for planning could be organized using the following outline:

- 1.0 Preparation for Program Formulation
  - 1.1 Assessment of sociopolitical environment
  - 1.2 Assessment of community concerns
  - 1.3 Establishment of terms of reference
  - 1.4 Identification of program planning team
- 2.0 Situation Assessment
  - 2.1 Community factors
  - 2.2 Organizational factors
  - 2.3 Assessment of health manpower needs
- 3.0 Priorities and Objectives
- 4.0 Program Design
  - 4.1 The health team

- 4.1.1 Manpower configuration
- 4.1.2 Job descriptions
- 4.1.3 Health team relationships
- 4.1.4 Deployment settings
- 4.1.5 Staffing patterns
- 4.2 Primary health service system
  - 4.2.1 Manpower configuration and requirement
  - 4.2.2 Administrative support system
  - 4.2.3 Financial planning and budget analysis
  - 4.2.4 Personnel system
  - 4.2.5 Technical supervision
  - 4.2.6 Supply management
  - 4.2.7 Physical infrastructure and equipment
  - 4.2.8 Primary health care support systems
  - 4.2.9 Health information systems
  - 4.2.10 Health service communication and health education strategy
- 4.3 Planning for training program development
  - 4.3.1 General background for training program development
  - 4.3.2 Development of plans for continuing education program
- 4.4 Development of a broad base of support for the program
- 5.0 Feasibility Analysis
- 6.0 Implementation Plan
- 7.0 Evaluation and Feedback
- 8.0 Replanning

Planning in general falls into three broad phases: descriptive, predictive, and prescriptive. The outline above covers these three phases. All planning is cyclic and should follow relatively well-defined steps. At the same time, planning should be sufficiently flexible to produce health programs appropriate to a country's needs. Discussed below are the series of steps we have found useful in developing primary health care programs that emphasize new

types of health manpower. As one moves through this chapter, it should be borne in mind that these planning guidelines reflect an ideal planning milieu and will usually have to be adjusted to the task facing the pragmatic planner.

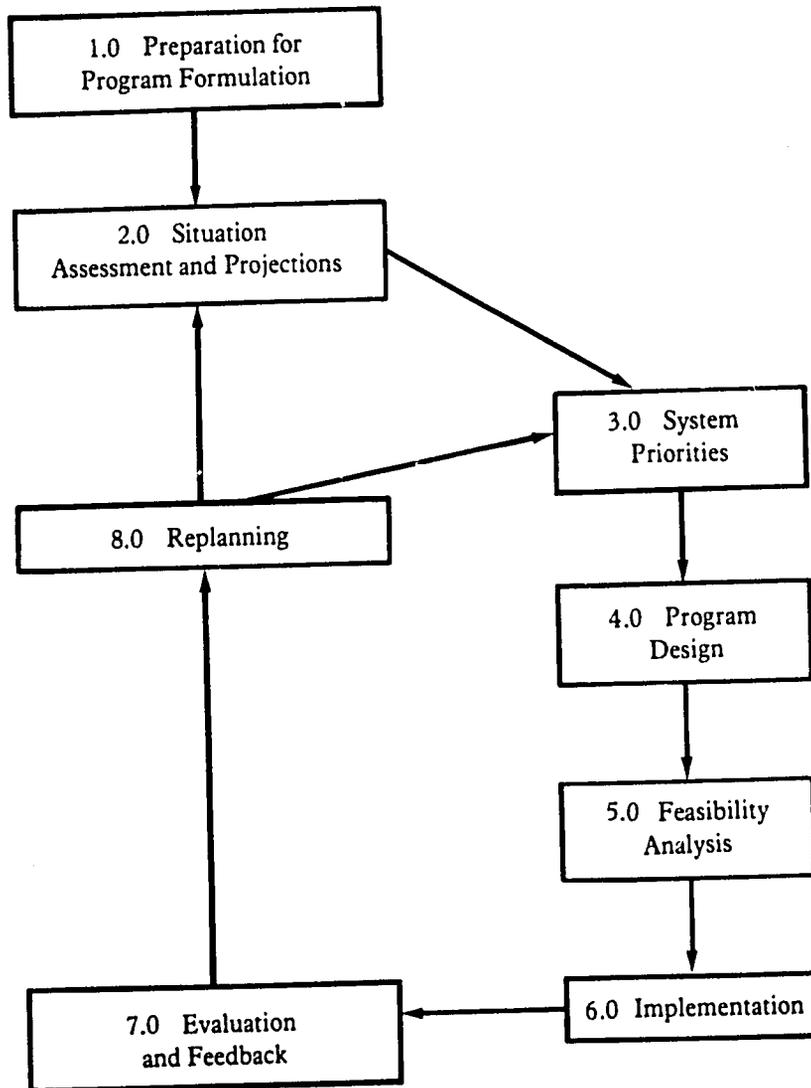
These steps (figure 3) are derived from standard planning documents listed at the end of this chapter (3-14). Each of these steps will be discussed, using a numerical outlining system to facilitate linkages within each step. Since health manpower planning and planning for primary health care systems are cyclic processes, planning for such programs should include the establishment of an organizational component capable not only of initial planning but also of data collection and analyses related to the system, evaluation of various facets of the program, and replanning for revision, modification, and redesign of those areas of the program that require change.

#### 1.0 Preparation for Program Formulation

Successful implementation of any project or program begins with careful planning in the design phase. Consideration must be given not only to those factors that directly affect the program but also to those factors that may have indirect influence on its long-range operation. In preparation for formal planning, there are some essential considerations.

1.1 Assessment of the sociopolitical environment in which the planning will occur and in which the program will be developed must consider: the existing government policy and priorities in health; the aims and limits of the planning effort expected by government leaders, and the degree of support that can realistically be expected from political leaders during planning and implementation. At this point, the aims and extent of the program should be discussed with various decision makers and community leaders. Clarification of overall government health policy and priorities is crucial at this stage. Also critical is exploration of the degree of political commitment to change. It has been demonstrated repeatedly that in the absence of a clear understanding of overall political in-

Figure 3. Steps in primary health care program planning.



tent, planning is fruitless. At this stage, the degree of commitment to various activities for the program's development must be ascertained. This process might take the form of reviewing potential steps to develop the needed support from decision makers and from the community at large, and then seeking firm commitments to changing the present status quo.

1.2 Community concerns about health status, health services, and the priority which governments give to health in their overall socio-economic development plans must be assessed. If these issues are not carefully examined and the relationships of community participation to planning exercises are not developed, a program may well be designed that does not meet the community's felt needs and demands. Thus, proposed solutions may not be culturally acceptable to the people directly affected.

1.3 Establishment of the terms of reference within which the planning exercise will be carried out must be done at this point. In establishing sector priorities a number of factors will play a role. These include justified or unjustified concerns of various special interest groups, political pressure, financial and social constraints. In health planning in many countries, top priority may be given to mass disease eradication programs, disease control, family planning, nutrition programs, sanitation and water supply projects. In this paper, for purposes of formulating program development guidelines, it will be assumed that a high priority has been assigned to the development of programs that provide or improve *integrated* primary health care services. Selection of this health service strategy will have been done in a prior planning process or may simply be an empirical political decision.

1.4 Identification of the program planning team. This team may exist within an established governmental unit (health ministry or planning commission), or it may be established as a new entity drawing participants and support from various governmental agencies and private institutions. Its scope and objectives must be clearly spelled out.

## 2.0 Situation Assessment

Essential to the design of a program that appropriately addresses the health problems of a population is a thorough understanding of the existing situation. This phase of the planning process is therefore *descriptive* and should yield a clear picture of the situation at both community and organizational levels. It will provide the information base from which projections will be made relating to health status, service utilization, health manpower, and health service system requirements. It will thus serve as the information base for the design and evaluation of the project. As such, it should provide a comprehensive overview of the community and the organization of health services. Included in this overview should be a careful review of past manpower planning efforts, present national health planning (country health programming exercises, etc.), and economic development plans. The assessment should include a review of:

### 2.1 Community factors

- 2.1.1 Population characteristics and trends
- 2.1.2 Socioeconomic characteristics and trends
- 2.1.3 Health status of the population: morbidity, mortality, disability, discontent; health needs and demands
- 2.1.4 Community expectations, wants, and the potential for contribution to health system change

### 2.2 Organizational factors

- 2.2.1 Existing health policies and programs
- 2.2.2 Organizational structure and function of the health service system
- 2.2.3 Health systems financing (public and private)
- 2.2.4 Health facilities inventory (equipment, staffing patterns, cost, utilization)
- 2.2.5 Existing health manpower configuration
  - a. Categories of health manpower: professional, nonprofessional, indigenous healers, and providers
  - b. Manpower productivity: organization and patterns of work, remuneration, quality of performance, and potential for delegation or transfer of functions

- c. Recruitment, attrition, and migration
  - d. Worker values
  - e. Educational institutions' capability for training
  - f. Potential manpower pool
- 2.2.6 Health services requirement
- 2.2.7 Health manpower requirement

### 2.3 Assessment of health manpower needs

Because the purpose of this planning is the development of a primary health care program intended to improve health services and manpower coverage, particular attention must be given to:

2.3.1 Analysis and projection of health needs and the population's demand for services.

2.3.2 Measurement of existing health manpower and an analysis of its pattern of utilization and effectiveness; this measurement should embrace all types of health workers. This will include all existing paramedical workers and should weigh the potential for upgrading these workers as providers of primary care. Also included in this assessment will be enumeration and assessment of the productivity of various types of indigenous practitioners and healers.

2.3.3 An estimate of future health manpower requirements and training needs in light of the overall health program.

2.3.4 Detection of imbalances between estimated manpower requirements and expected supply.

2.3.5 Assessment of the existing support infrastructure for the health service system within which present health manpower functions. This will include a review of the administrative system, physical structures, logistic and supply systems, and the health information system.

Frequently, information on a population's health is limited. This should not deter planning; it does, however, test the ingenuity and integrity of the action-oriented planner. To this end the reader is referred to a subsequent chapter on evaluation which describes an often used, but seldom discussed, assessment technique that can be used in starting programs. This evaluation technique is rapid, less formal, appropriate to the available data, and of minimal cost. A

more formal planning and evaluation procedure may be preferred if additional time and resources are available.

### 3.0 Priorities and Objectives

As previously noted, this planning model is based on the assumption that a primary health care and health manpower development strategy has been given top priority. It is essential that this assumption be reviewed before embarking on a detailed tactical plan. Opinions and attitudes of government decision makers, community spokesmen, political figures, and technical experts should be reviewed. If primary health care continues to hold high priority, the planning team can proceed to articulate objectives for a program. These objectives should be operational objectives and should specify quantifiable, realistic, and attainable goals consistent with sources available for their development.

### 4.0 Program Design

These guidelines are directed toward health services using nonphysician health manpower. In addition to increasing trained manpower, they emphasize expansion of the entire management support system which is required for the maintenance of an effectively functioning health care system. In developing these guidelines, special attention was given to the expansion of the MEDEX program in the United States and in Micronesia. As described in the previous chapter, our experience is that the seven elements critical to MEDEX-type program development in these two settings (and more recently in four other developing countries) have clear relevance to manpower program development in much of the developing world.

The assessment of needs is the basis for the overall program design. It establishes the scope of the program, the particular type of manpower to be recruited and trained, and the necessary improvements in the organizational support system. Attention to the situation assessment will give greater assurance that a plan is socio-culturally acceptable and administratively and financially feasible. Design of the program can be divided into several broad categories as outlined below.

#### 4.1 The health team

Health teams can be constituted in several ways. Prior to embarking on a description of the health team, the experiences of other countries' approaches to providing primary health services should be reviewed. Particular attention should be paid to strengths and weaknesses of programs using nonphysician health service providers and to whether any of these experiences apply to the present planning. Particular attention must be given to existing health workers, both within and outside the formal health service system. Defining the health team would include:

##### 4.1.1 Manpower configuration

Planners must either choose a single manpower model or outline a series of alternatives for consideration and possible field testing. The number of tiers of health workers that will comprise the health team must be established. Each tier will represent a greater or lesser complexity of training and technical skill. At one extreme will be the highly trained doctors and dentists, and at the other extreme, the minimally trained community health worker (CHW) with only several weeks of training. Intermediate-level doctor extenders (medex) will fall between these extremes and in general will have twelve to eighteen months of training. Some countries will opt exclusively for professional workers as providers of primary health care in an expanded system. However, as we have seen earlier, most of the developing world cannot consider this a viable option because of a shortage of professional workers and inadequate financial resources. Most countries will settle on a mix of professional and nonprofessional providers. The final decision on the composition of the health team frequently will be political. Planners should seek to insure the best utilization and the greatest productivity of each of the individual workers within the system. The ratio of professional to nonprofessional workers that provides the most effective span of control will vary from country to country. Geography, climate, transportation, and communication will determine how effective supervision and support of peripheral workers can be in each country's setting. Past experience has established a useful working ratio ranging between five to one and nine to one non-

professional to professional workers. The effective span of control between mid-level workers and community health workers needs to be established and carefully monitored in each program. The time available for supervision usually will determine the number of community health workers associated with each medex. Deployment in terms of transportation and communication requires careful review before final decisions can be made.

Critical and effective planning in the development of the health team will make optimum use of existing health workers. This includes not only those participating as functionaries of the official health system but also various types of indigenous or traditional health workers. In some settings, there may be no useful role for these workers. However, in many countries they constitute a significant economic factor and have considerable political influence. They represent a significant manpower resource, and in every situation serious effort should be made to utilize them if possible.

#### 4.1.2 Job descriptions

Job descriptions for each level of health worker must be developed. In a system using various levels of health workers, the role and responsibility of each must be clearly spelled out. Experience in both the developing and developed world indicates that each function should be assigned to those least trained individuals capable of adequately carrying out the function. Doctors will provide technical supervision and back-up support for less trained health workers. The program plan should emphasize this role of the doctor.

#### 4.1.3 Health team relationships

As a corollary to the above item, it is essential to define the team relationship and responsibility of team workers to one another. Health workers with limited training will be deployed into rural settings that frequently do not allow a great amount of direct contact with supervisors. It is most important, therefore, that relationships be clearly spelled out, including the indications for case referral. Cases considered within the technical competence of each level of worker must be identified as well as those that obviously require

referral. Methods to insure adequate supervision and accountability must be stated with clarity.

#### 4.1.4 Deployment settings

In determining the composition of the health team and the role of individual members, attention needs to be given to the setting in which each level of worker will function. This is especially important for the mid-level and community-level health workers. The limits of responsibility of each worker will be determined to a significant extent by available facilities and equipment. Transportation and communication will dictate access to supervision, consultation, and referral. In some locales, the health worker will experience greater autonomy than in others. Access to supplies and equipment also will determine treatment capabilities. The medical formulary available to each level of health worker also needs to be established. This may include political as well as technical decisions regarding the prescription of certain drugs.

#### 4.1.5 Staffing patterns

To establish staffing patterns in various types of health facilities, consideration must be given to:

- a. Traditional and cultural practices
- b. Case load based on population coverage and projected utilization
- c. Extended technical training of various team members
- d. Civil service requirements
- e. Types of health problems

Staffing plans for each facility should ensure adequate coverage for the population in the catchment area. It should be sufficient to cover holidays, sick leave, etc. Plans should provide adequate coverage to allow for continuing education and supervision of the more peripheral health workers, and for record keeping as the health information system develops. Accurate methods of determining worker productivity are not available throughout much of the world, but empirical calculations of case loads on which staffing can be based are available. Most of these are based on norms of spontaneous demand for care. Utilizing these norms, which run be-

tween 1 and 2.5 visits per person per year for most health systems, one can calculate the total expected number of visits to a facility per year. Multiply this number by an estimated time to provide each unit of service. From this total number of hours per year, calculations can be made of the expected number of hours of work per facility per working day. Since these estimates are extremely generalized, plans must be made to adequately monitor patterns of demand, utilization, and deployment of manpower in order that the entire system can function most effectively and efficiently.

#### 4.2 Primary health care service system

Developing needed health manpower is only one aspect of the change necessary for effectively expanding and strengthening primary health care services. The entire system within which health care is delivered must be strengthened. Therefore, the organizational infrastructure should be carefully reviewed. Efforts to improve and strengthen the system must parallel the manpower development effort. A series of broad categories within which the health service system can be reviewed and strengthened is outlined below.

##### 4.2.1 Manpower configuration and requirement

Planning for strengthening of this section of the health service system is covered above in a review of health team planning.

##### 4.2.2 Administrative support system

A majority of problems in program implementation arises from management rather than technical factors. It is essential to review the overall administrative environment within which the program will operate. The existing support system, including its administrative personnel as well as its management training, techniques, and policies, needs to be reviewed realistically. While moving forward in program planning, efforts should be made to analyze existing organizations as they relate to the development effort. If this is not done, the overall program may well be jeopardized. It is important that organizational development efforts be initiated early in planning. Detailed management views are beyond the scope of this chapter. Briefly, however, techniques found useful in improving management capability are (a) a selection of qualified and well-

motivated leaders, (b) provision of management training, (c) defining clear operational objectives for each organizational unit within the sector, (d) developing incentives for managers related to performance of the overall system, and (e) the development of standard operating procedures for mid-level and lower management personnel.

#### 4.2.3 Financial planning and budget analysis

The cost of expanding a health system rapidly will be considerable. It is, therefore, most important that these costs be analyzed for decision makers. Modern management methods, including the use of a program planning and budgeting system, should be implemented. Giving inadequate attention to recurrent costs during the early planning stage risks plunging a program into long-term financial difficulties that can be avoided.

#### 4.2.4 Personnel system

Personnel policies and regulations can be a significant obstacle to the introduction and acceptance of new types of health workers, particularly if credentials and degrees are essential to advancement. Success of the program depends heavily on *early* removal of these obstacles if they exist. Modification of any restrictive regulations should occur before or simultaneously with program implementation. These changes may take the form of changes in the medical practice act or government personnel merit system.

#### 4.2.5 Technical supervision

As was stated in the discussion of the health team, clearly defined supervisory relationships must be established. These supervisory relationships should not be punitive or authoritarian but should include consultation, referral, feedback, and continuing education, in addition to the traditional technical quality control and administrative supervision. Standard operating procedures must be developed consistent with these relationships. Establishment of these procedures and careful implementation of them will improve the effectiveness of the more peripheral health worker and produce greater job satisfaction with less attrition from the system.

#### 4.2.6 Supply management

Underutilization of health facilities in many areas is frequently

related to the lack of available equipment, drugs, and supplies. Improvement in supply management is critical to improving health services. Development of simple inventory systems, provision of supply transport, and control of loss or theft yield significant results. Training in supply management and development of standard operating procedure manuals in this area are necessary also. Development of incentives for careful monitoring of supplies would help to reduce losses. Continuous review and revision of logistics in supply procedures should be built into management of the program.

#### 4.2.7 Physical infrastructure and equipment

This aspect of health sector planning has frequently been overemphasized in many countries. Development of the physical facilities frequently consumes a disproportionately large share of the budget. Planning for facilities should highlight:

- a. Easy access by the population
- b. Provision of essential utilities (water, light, etc.) and necessary communications
- c. Essential laboratory equipment
- d. Some provision for accommodations for the unit's personnel

In order to minimize capital costs, communities should be encouraged, where feasible, to provide and maintain facilities.

#### 4.2.8 Primary health care support systems

Adequate clinical laboratory services are desirable but not critical to provision of minimal primary health services. Expansion of health services will eventually create a demand for more sophisticated laboratories and early planning is helpful to their timely development. Usually included in this phase of health service development is provision for research and graduate education. It is important to consider these particular aspects of the health system, but they should not be overemphasized in the initial expansion of primary health care services to meet basic needs of grossly underserved populations.

#### 4.2.9 Health information system

Essential to the overall evaluation and management of the health service system is a simple and effective health information system.

This system needs to be developed in conjunction with expansion of the health sector. Health planners need to review carefully what information is essential to the management of the program. Such information includes an ongoing manpower inventory, detailed cost control data, demand and utilization data, and enumeration of those diseases or health problems about which critical decisions need to be made in provision of future health services. A health information system also requires an operational patient records scheme. Information systems are further discussed in a later chapter, where they are related to other aspects of primary health program operations.

#### 4.2.10 Health service communication and health education effort

Starting a new program is an opportunity to change the image of the manner in which health services are provided. It is an opportunity also to introduce new and competent providers of appropriate services. Maximum use of the health service system can be achieved by informing the public of the availability of services and the benefits they afford. This means a comprehensive public information program should be developed. Just as important as informing the public of the services and benefits available is an education effort directed against overuse and use of the wrong facilities. The information program should seek to strengthen the rural health education program for the country in all aspects of personal and public health. The communication program will vary from country to country depending on traditional patterns of communication. The information effort should use every means available for the greatest impact on the largest possible audience.

#### 4.3 Planning for training program development

The first step in developing a training program is to outline qualifications and competencies to be inculcated at each level of health worker. This exercise highlights problem areas by bringing individuals together to discuss and debate what needs to be done. It is essential to emphasize that a reorientation of training for certain positions must take place if a health team approach is to be adopted.

Physicians' training traditionally does not prepare them for this role.

#### 4.3.1 General background for training program development

Alternative approaches to training various types of health workers in different countries should be reviewed. A variety of training options can be analyzed. The advantages and disadvantages of each option and each country's experience with it should be reviewed. A subsequent chapter describes the Health Manpower Development Staff's approach to training, which is a structured amalgam of traditional and contemporary training methods.

A series of questions should be asked for each level of health worker in the system. The answers will help define the training program.

Questions related to training programs are:

- 4.3.1.1 Where will training take place?
- 4.3.1.2 How will the training be carried out?
- 4.3.1.3 Who will do the training?
- 4.3.1.4 For what period of time will the training take place?
- 4.3.1.5 When will training take place for each category of health worker?

Who will be selected for training in each tier or category of worker has to be decided early. This in turn requires selection criteria. An idealized list of criteria should be established and then modified to deal with the realities of the situation.

Doctors and nurses have been tutors for the initial classes in most MEDEX-type training programs. Medex with additional training can successfully train subsequent classes of both mid-level and community-level health workers if a clear, concise curriculum has been developed. Such a curriculum approach is considered in detail in the chapter on training.

#### 4.3.2 Development of plans for continuing education program

Continuing education frequently is inadequately covered in many training programs. It is important, if continuing education is to be correlated with the general curriculum, that efforts be made early to plan the continuing education component and the frequency of training sessions. Early consideration should also be given to con-

tent material of the continuing education sessions. The program should be geared to correcting deficiencies in the job performance of health workers and to the acquisition of new knowledge and skills. Because supervision is critical to health worker performance, the supervisor should know the frequency of specific health problems treated and the most frequent misdiagnoses or errors in treatment that occur. The training program thus can focus on those practical problems which health workers encounter in the field and will reinforce existing knowledge and skills as well as adding new ones. The duration of continuing education for each level of health worker will need to be established after the program is operational. Each fulltime medex should have a minimum of two weeks of continuing education each year. This can be given at one time or can occur periodically throughout the year. Failure to provide a continuing education program will lead to rapid deterioration of the skills of these workers.

#### 4.4 Development of a broad base of support for the program

Some general suggestions were made in the preceding chapters relating to the base of support for the program. Some of them need further discussion. For reasonable assurance of success, it is imperative that the program be supported by all those with an interest in the delivery of primary health services. Planning for the development of this active participation and support of the program must begin early during the design phase. It is especially important to involve pivotal groups whose failure to participate might jeopardize the program.

National political leaders and highly placed officials in the ministry of health should be encouraged to make public statements of support. Governmental directives should be issued early so that appropriate government agencies can support operations quickly. Examples of such agencies and actions required include personnel offices to reclassify and/or add new health workers with new salary scales. Public works departments should be involved in the modification or construction of health facilities.

Educational institutions are the principal trainers of health

workers in most countries. Early participation and planning by leaders of these institutions is essential in order that health programs may benefit from their expertise and to insure their continuing contribution. Further institutionalization of training programs tends to stabilize them.

Professional associations, particularly those of doctors and nurses, also are critical to development of new types of health manpower. If these professionals are not actively involved in the program effort, they may become obstructionist, particularly if the new health program is perceived as an economic or social threat. Because they have been leaders in the provision of health care, professional groups should participate in program development. Their understanding of the program and participation in its planning and implementation will greatly reduce the risk of their becoming opponents.

Community leaders and members of the community at large should also be included early in planning to insure the development of a program that meets their perceived needs and that will gain acceptance and be utilized by the community.

The input of international donor agencies and technical support groups should be solicited early if there is significant potential for their financial or technical support for the program.

### 5.0 Feasibility Analysis

The general program strategy as well as the individual tactics proposed must be subjected to feasibility study. These feasibility studies will include technical, social, financial, economic, and administrative review. Assessment of the potential benefits of the program must be weighed against the potential risks and the alternatives defined for the decision makers. A careful review of the project requirements if it is to achieve its stated objectives must be carried out and realistic judgments made regarding the potential availability of various requirements (finances, manpower, commodities, information, and technical skills). Additionally, the program must be analyzed as to whether it is the best course to take to reach pro-

grammatic objectives, and, if it is not, what additional planning of alternatives must be carried out.

#### 6.0 Implementation Plan

The most important step in program development is the actual implementation of the program plan. A detailed implementation plan should be worked out that states what actions are to be carried out, by whom, and at what point in time. This implementation plan should include a network analysis that identifies important milestones. Detailed budgeting of the program against program milestones needs to be carried out to set up a control system insuring that expenditures of funds are appropriately correlated with completion of project activities. Implementation is further discussed from another viewpoint in the next chapter.

#### 7.0. Evaluation and Feedback

Evaluation is a critical step in the overall cycle of planning-implementing-evaluating and replanning of programs. It is essential in the rational management of health services. Program managers must review and analyze their efforts in order to determine what has happened and why so that appropriate decisions can be made about continuing the effort, modifying it, or discontinuing it. Evaluation will be greatly enhanced if there is a clear definition of the program in the original design. Program evaluation begins during program design and it is an assessment or validation of elements in the original design. This is discussed in greater detail in the final chapter of this book.

#### 8.0 Replanning

Since planning is rarely infallible, particularly in complex social environments, many of the assumptions in the original program design will prove to have been slightly biased or completely wrong. Utilizing the evaluation process to test the assumptions in program design, the management team can constantly reassess progress, consider alternative courses of action, and make decisions to continue,

modify, or terminate either selected portions or all of the program effort. Recognizing the probable necessity to replan and redesign certain aspects of the program at the outset keeps project managers from becoming overly preoccupied with their inputs and outputs. Replanning of the program may take the form of alterations in the situation assessment, reordering of priorities and objectives, and/or remodeling of certain aspects of program design.

Replanning is a vital link in the cyclic process of planning and it is critically important in contemporary primary health care systems. If replanning can provide needed flexibility and this chapter can be viewed as a guide for preparing a program plan that is appropriate for a population's primary health care needs, we are now ready to proceed to the practical aspects of implementing such a program.

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CHAPTER 4

**Implementation—An Art in Itself**

*Richard A. Smith*

Major impediments to implementing and operating programs in health and other development fields are faulty program design and inadequate management and administrative support capacity. It is hoped that this book, representing our own experiences (successes and failures) and the experiences others have shared with us, will assist primary health care program designers elsewhere in solving some of these problems.

The development of mid-level management training modules by the Health Manpower Development Staff at the University of Hawaii is but a small contribution toward improving management capacity. We encourage others to seek additional ways to strengthen appropriate management competencies in developing countries. It is our conviction that the availability of adequate management skills will "make" or "break" primary health care programs. To this end, we have added to our staff management specialists who are not bound by traditional approaches to public administration. Rather, they understand the need to develop broad management skills and capabilities relevant to the dynamics of change. Implementation is the first publicly visible aspect of program management. It is set

apart in these guidelines because of its special place in development.

Implementation is usually considered to be a part of management, and justifiably so. However, in the present era of extensive and rapid interdigitating communication networks, which determine the flow of information and power, circumstances may dictate the need to view implementation as a very specialized activity requiring a special orientation and special skills.

Unlike classical management discussions, this chapter and the following chapter on primary health care program operations will describe potential contemporary scenarios of program development and also will discuss practical approaches to moving such programs to fruition.

Our own experiences, consultations, and readings indicate a need to discuss program implementation in its usual context of complicated forces and unclear lines of authority and responsibility, some of which are disguised by drawing dotted lines on an organization chart. Very frequently, however, the important lines are not drawn—but they do exist, and they are used extensively to accomplish programmatic objectives. To work effectively in this milieu, one has to have a clear idea of one's own social commitment and technical integrity (one's ideals). Furthermore, the program implementer must be aware of forces within and beyond his control which affect programs; these may be rational or irrational, nevertheless they do exist (as realities). We have an operating philosophy that considers these elements and has proven effective for us in respect to program implementation. We call it "idrealism." An "idrealist" is an idealist who has been tempered by the brutalities of reality; he has learned to effectively and productively compromise and cope with his environment as it is without compromising basic integrity. It is such an approach to implementation that is suggested in these guidelines for primary health care program development. In a word, we are talking about pragmatism.

The previous chapter described the planning process that precedes implementation of a program to improve or expand primary

health care services. Development of such programs can be aided by understanding discrete management steps that should be taken sequentially. One of the most lucid discussions of implementation and initiation of projects is found in *Health Project Management*, produced by the World Health Organization in 1974 (1). Figures 4 and 5 (from that publication) outline rational steps to be taken in implementing and initiating projects after they have been formulated.\*

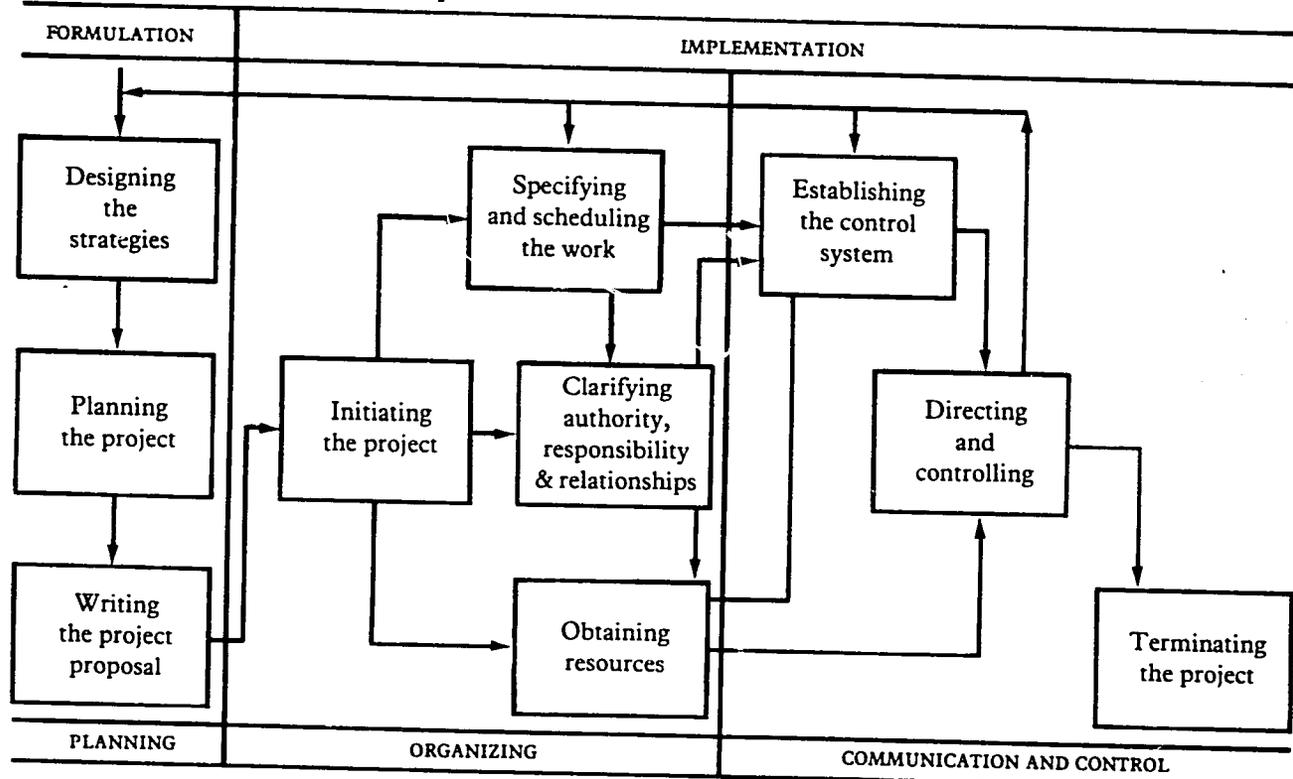
Much has been written about rational approaches to management. Some authors in the field augment this rationality with descriptions of alternative pathways to be taken to give the reader options in the scenario in which he or she is operating. Unfortunately, rational implementation and management frequently are based solely on linear thinking, on the logical, the ideal. Our experience with the MEDEX approach to primary health care systems (an amalgamation of successful program elements from around the world) indicates that many implementation problems do not fit "logical" textbook prescriptions for solution. Rather, the problems can border on the illogical and irrational. They can arise from unexpected sources, so it is the unexpected that should be anticipated and planned for. One invariably finds the unexpected, which prior logical analysis does not predict, combined with the predictable problems and pathways of program implementation (the ideal). A way of coping with this problem is the idrealistic approach—one merging idealism and reality. It is an approach that requires a combination of productive intuition (based upon previous experience and conditioning) and analytic competence (2).

These talents can sometimes be found in one individual. If such a program leader/implementer is thoroughly grounded in the political and other cue systems of the culture, a critical element for successful program implementation has been found (3). Sometimes leadership for implementation may require the combined talents of

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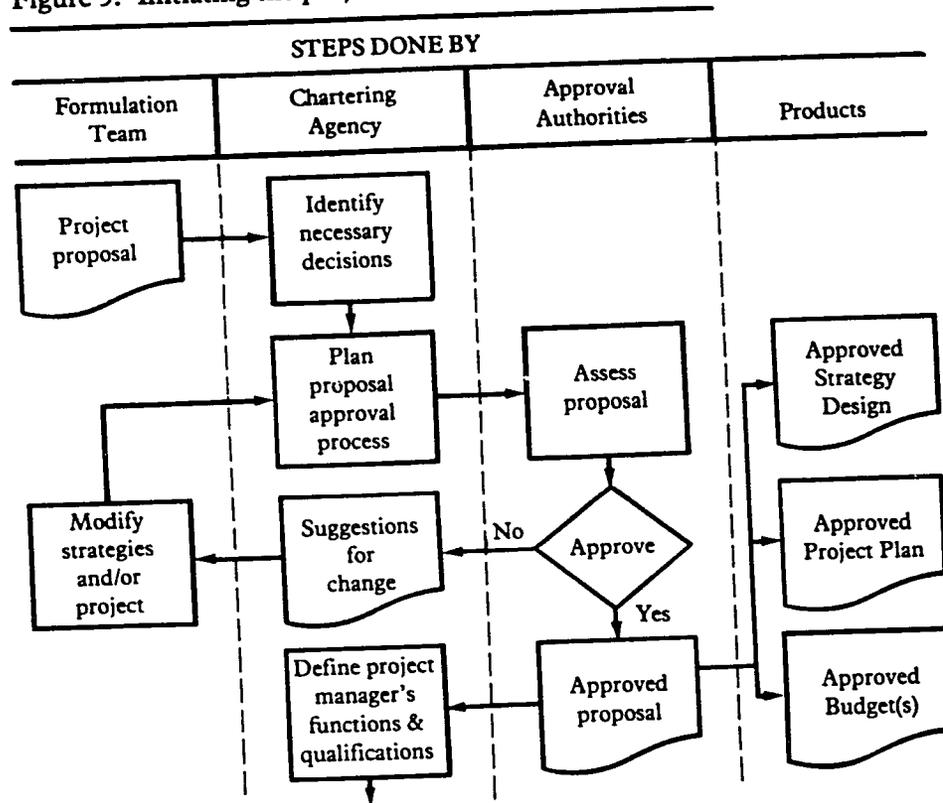
\*Although a *project* is defined as a temporary intensive effort, much of the same management activity is applicable to *program* implementation, which is a larger, long-term undertaking.

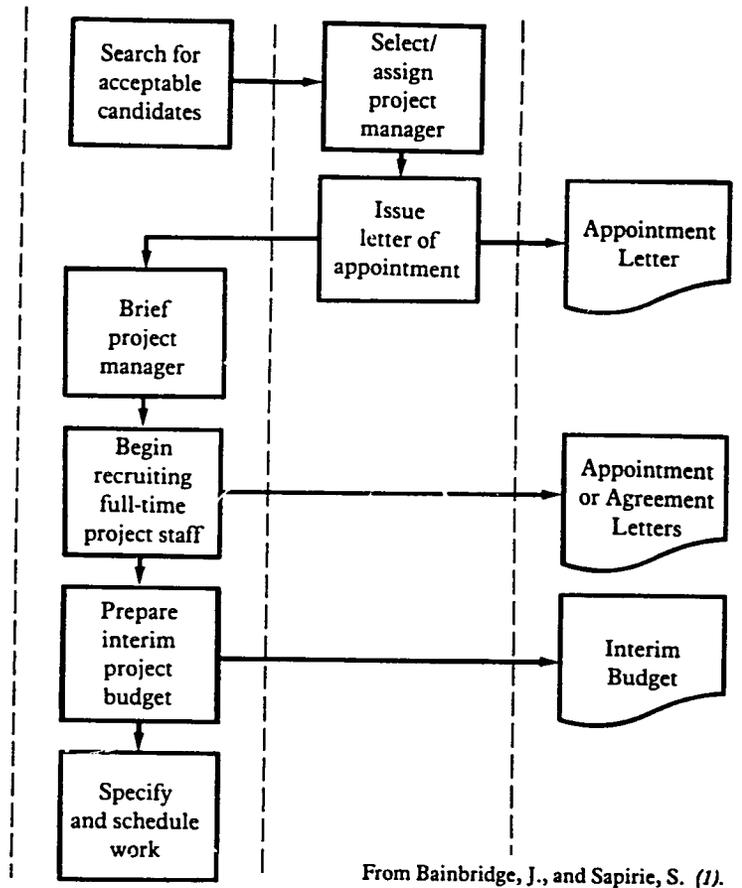
Figure 4. Project management steps.



From Bainbridge, J., and Sapirie, S. (1).

Figure 5. Initiating the project.





From Bainbridge, J., and Sapirie, S. (1).

more than one person to handle the analytical, linear, and logical ideals on one hand, and the intuitive, relational (holistic), and often illogical realities on the other.

A final word is necessary about staff selection. In some countries two different types of health program administrators and staff may be required for the two major types of organizations that make a program successful (4). After a program is implemented, the excitement and vibrance of the unstructured newness wears off and program management must then move into a maintenance phase. This phase requires structure to be developed, bureaucratic relationships to be worked out, and a staff that is content with a more steady pace of routine activity and accomplishment. The implementing staff that starts a program (they may also be the program's planners) might be called "pioneers." The staff that later enters the picture and maintains the program could be viewed as "settlers." If a country uses personnel talented enough to fill the roles of both pioneer and settler, problems of continuity arise with less frequency and severity. It is important, however, to be aware of these phases since the transition is often difficult for a staff that has become accustomed to the high level of stimulation characteristic of the implementation phase.

Rondinelli has summarized the major problems of program implementation in developing countries (5). Problems he identified that are relevant to this discussion include:

1. Ineffective planning and preparation
  - a. Inappropriate or ineffective identification and preparation procedures within national planning agencies and operating ministries.
  - b. Adverse distortion of development patterns through imposition of funding agency priorities on recipient governments.
  - c. Inadequate analysis of the absorptive capacity of developing countries to finance, execute, and operate specific types of projects in each sector.

2. Faulty appraisal and selection processes
  - a. Objectives and expected outputs of projects not clearly defined.
  - b. Overemphasis on financial targets in project appraisal and selection; projects selected on the basis of total amounts available for investment rather than on the productive outputs of the project proposals.
  - c. Overemphasis on economic and technical criteria in project appraisal and selection; neglect of administrative, social, cultural, and environmental impacts.
  - d. Long lag periods in the processing and approval of projects by international funding agencies.
  - e. Perpetuation of previously initiated projects through follow-on and piggy-back funding; inadequate assessment of requests for continuation of second-phasing funding.
3. Defective project design
  - a. Project design inappropriate to local conditions, needs, and capacities.
  - b. Underestimation of resource needs, amortization obligations; insufficient allowance for demands of other ongoing projects on available resources.
  - c. Lack of contingency planning to meet emergencies or unanticipated delays.
  - d. Failure to select adequate baseline data and developmental indicators during design to allow monitoring, control, and postevaluation.
  - e. Lack of interaction between project planners and ultimate users, clients, and beneficiaries during design.
  - f. Failure to account adequately in financial plans for inflation, price increases, and increases in salaries affecting overall cost of the project.
4. Problems in start-up and activation
  - a. Delays in granting necessary national and international approval for starting project; procedural and bureaucratic delays within assistance agencies and national governments.

- b. Interministerial rivalries, and lack of cooperation in allocating and disbursing resources required for project.
- c. Failure to define the relationship of the project organization to broader institutional and administrative structures.
- d. Inadequate organizational planning, leading to creation of inappropriate or ineffective project implementation unit.
- e. International assistance agency field capacity too low to provide technical assistance during start-up of project.
- f. Failure to redesign the project upon discovery of unanticipated obstacles during organization and operation.

Our approach to cooperating with other countries in program implementation is concerned with ten areas:

- Awareness of problem
- Consensus of need and ability to act upon the problem
- Strategy for action
- Commitment to action
- Action
- Evaluation and feedback
- Refinement and revision
- Norming operations
- Sustaining operations
- Stopping operations

The first five points relate specifically to implementation. Evaluation and feedback and refinement and revision are the transition areas that bridge implementation and ongoing operations. Only the first five points will be discussed at length in this chapter.

#### A. AWARENESS OF THE PROBLEM

Before a viable program to expand or improve primary health care services can be established, it has to be perceived as responding to a real problem. Awareness of the problem of accessibility to quality health services should be obvious, not subtle. It should be of paramount concern to the government and the people. Awareness of the

problem can be based on data that is available; it can be based on political expediency; or it can be based on a combination of the two.

#### B. CONSENSUS OF NEED AND ABILITY TO ACT UPON PROBLEM

Need for the program may be linked to national development (see chapter 1). It may be linked to political and social stability because health care is one of those vital and visible personal services that a population can readily attribute to government interest in their well-being.

National political consensus to develop a program responsive to a nation's health coverage problem is essential. The consensus should reflect popular will. The fact that other countries are using new solutions to solve problems of health coverage may ultimately play a role in decisionmaking. However, each nation should decide its own specific pathway. Further, resources to develop a responsive program should be easily available, or able to be competed for, for example, by a project proposal. If the necessary resources are unobtainable, it would be better to await a more propitious time than to mount an easily recognizable facade.

#### C. STRATEGY FOR ACTION

A strategy for action may be outlined in the health section of a national development plan, or it may be developed from stated government health policies. It is important at this stage to decide whether the strategy is to be merely a political facade or a serious undertaking related to national development.

In countries considering the initiation or expansion of a primary health care program using doctor extenders, it is our feeling that there is little need to consume precious time and resources in three- to five-year research and demonstration projects in order to prove a known fact. It may be easier to control the variables when one is managing a small-scale demonstration program; and if sufficient resources are invested, such a program can almost always be made to "succeed" regardless of its potential for national replicability. But the concept of doctor extenders providing increased health service

coverage has already been proven valid; the wheel does not need to be reinvented each time it is used. A program should be planned that will provide services to the entire country (once a national consensus and a national will to improve coverage is developed). This national program can be initiated at a carefully calculated pace that starts slowly, then expands countrywide after the major implementation problems have been worked out. *Only in an operational program can the major operational problems be worked out since they require a national commitment for their solution.*

Unlike some other components of developmental strategies, the need in health is not for the discovery of new knowledge and technology. Rather, the need is for a national strategy to apply what has already been proven, and to adapt such knowledge and technologies appropriately to meet the particular needs of a specific country. Appropriate application of existing knowledge is the key. One should be cautioned, however, that some technology is inflexible and cannot be adapted. It must be accepted—or rejected—as is. However, other technology that is flexible and adaptable has been developed and continues to be refined. Its countrywide application is already having a significant impact on health problems in the Third World.

The benefits of a collaborative working relationship with vested interest groups have been discussed earlier. Their cooperative participation should be sought actively. The importance of this factor becomes apparent when long-term goals and short-term objectives are defined in the strategy and ways have to be found to neutralize any possible opposition.

In developing the strategy from an existing health or development plan, the appropriateness of the plan must be weighed along with its reality orientation (idealism). The predictably successful strategy should have four characteristics in addition to its appropriateness. It should be flexible, capable of withstanding slight modifications that do not affect its ultimate objectives, designed so that it can be integrated into existing developmental plans, and predicated upon a reasonably accurate assessment of the country's capacity to absorb and maintain the resulting program (5,6).

#### D. COMMITMENT TO ACTION

*In order for a country to successfully expand/improve its primary health care service coverage to the majority of its population, there has to be a national commitment to develop a countrywide program from the beginning.* This means that the highest level of government must decide to pursue vigorously a program of national coverage. There have been enough research and demonstration programs around the globe to indicate that the methods tried, the knowledge gained, and the technologies that have resulted are sufficient for nations to glean and adapt usable approaches to the problems of health coverage. A program can start with a small scope to work out methodological and adaptation problems and then carry the initial phase into a program of national coverage. However, if there is no commitment at the beginning to expand the program nationally, a process of prolonged dissipation of interest, momentum, and resources will inevitably occur. It is true that demonstration programs provide useful research information; however, multiple demonstration programs in the same technical arena are poor investments in this time of diminishing resources. It appears that in this field decision makers must think big and work out the operational problems within the context of a national program. The alternative is to think small, time and again, and never to have the resources committed or the receptive framework developed to accomplish the socially significant.

#### E. ACTION

Action begins with the selection of a top quality program director, someone proven competent in previous management positions. We endured many mistakes before realizing how valid is the Markarian adage: "Past performance is the best predictor of future performance." Once selected, the director must be given the necessary authority and support to carry out his responsibilities.

Program implementation should not be undertaken until points A through D (above) have laid a sound base from which to launch action.

Action implies change. Action in a program context means the establishment of new, expanded, or altered components. This means change from the status quo. The rate of change may be quite variable.

1. Action involving relatively rapid change is frequently seen in a developmental situation. Two types of rapid change can be identified:
  - a. Rapid change primarily involving new or innovative components:
    - (1) may appear to consume more resources initially; however, after initial capitalization, saving of resources becomes evident.
    - (2) may be resisted because change is uncomfortable and threatening.
    - (3) should be accompanied by public awareness of program.
    - (4) should be integrated into existing system.
  - b. Rapid change primarily involving improvement or expansion of existing components:
    - (1) has inertia as a major problem because the status quo is comfortable to controllers of the present system.
    - (2) is less expensive; however, nothing ventured, nothing gained.
    - (3) may or may not be accompanied by public awareness of program.
    - (4) continues the existing system.
2. Action involving slow change is usually low-profile. It is characterized by changes over a long period, usually brought on by the force of time.

The following are related to the implementation strategy but actually fall under the rubric of program operations. They are listed here since the progression of a program from implementation to operation is not often marked by a clearly demarcated break.

**F. EVALUATION AND FEEDBACK**

The key to successful program maintenance is to know whether or not you are doing a good job, when to alter, and how to improve. This depends on a reliable management information system.

**G. REFINEMENT AND REVISION**

This is a function of evaluation and feedback. It is important to prepare for this activity.

**H. NORMING OPERATIONS**

This is the development of performance standards and the establishment of routine (normalizing) activities. It is part of the transition from "pioneering" to "settling."

**I. SUSTAIN**

If short-term objectives are being met, the program is performing.

**J. STOP THE PROGRAM**

Our experience to date, and the experience of others, indicate that if appropriateness and flexibility characterize the strategy and staff, stopping such a primary health care program would be a decision of rare occurrence. Nevertheless, if objectives are not being met and a well-intentioned program becomes a facade, it may be desirable to cease operations. This can be as much of a challenge as starting a program! The most common method of stopping a program is called a reduction in force (i.e., money, positions). Another is to transfer resources to another program. Closure can be mandated (legislative, programmatic, with definite criteria for end of project). Or one can be inventive and come up with program-destruct methods that will stagger the imagination of your colleagues.

Finally, knowledge of the phases that most staff relationships go through should be shared. The four periods that characterize relationships in general, between two people or a group of people, are the following:

1. *Storming*. The initial times when a new staff is together. It is characterized by a certain tenseness as people try to figure out their relationships to each other, their purpose in being part of the program, and what their specific responsibilities will be. This stage is the most variable in length.
2. *Forming*. Relationships are formed; people begin to determine how they will work with each other.
3. *Norming*. Setting performance standards; assuming the responsibility to move on to the next stage.
4. *Performing*. Program is operational, meeting performance standards, approaching or attaining short-term objectives, producing. When this stage is reached, the program director and others will have enough information to decide whether the program is going to meet its objectives or if operations should cease (7, 8).

A summary construct of this chapter would be:

<u>SUMMARY</u>		
Storming	Awareness Consensus Strategy	PIONEER
Forming	Commitment Action	
—————		
Norming	Evaluation and Feedback Refinement and Revision Norming	SETTLER
Performing	Sustain Stop	

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## CHAPTER 5

# Training For Competence and Relevance

*Michael O'Byrne, Thomas G. Coles, and Joyce V. Lyons*

### **Introduction**

The training division of the Health Manpower Development Staff consists of four fulltime people: a physician, a medex, an educator, and a secretary/librarian. Over the past several years, this core group, along with the rest of the Health Manpower Development Staff and several consultants, has worked with the ministries of health of a number of developing countries to establish training programs for mid-level and community health workers. This has been accomplished under the rubric of the MEDEX approach that has been previously described.

This chapter is concerned with a more tangible output (a detailed training program) than are other chapters in this book. Discussing methodologies and training tools that may not be in common use in many parts of the world requires that this chapter include more detailed information, and the discussion is frequently from a personalized viewpoint to assist the reader to appreciate the practicality of this approach to curriculum design.

The training program is in reality an evolving training system. This system, referred to as the System of Teaching Essentials to Medex (STEM), consists of: (1) a series of prototype or "generic" training modules covering the spectrum of tasks usually assigned to

a mid-level worker; (2) an administrators' training program; (3) a program for adapting these modules to fit health, administrative, and cultural variables specific for a locale; (4) an adaptable program for actually implementing this modularized curriculum; and (5) a program for training prospective trainers in the use of the modules.

Most physicians and other health professionals have had little experience with the actual design and implementation of a training program—especially for a relatively new category on the personnel list. Combine this with the fact that there is a paucity of suitable text materials written for mid-level health workers in developing countries and the rationale for the five components of this system become evident. This is not to imply, by any means, that all the ingredients for any training program are in STEM, ready to lay out in cookbook fashion. However, this system has proven useful in determining what these ingredients are, and how to mix and apply them. STEM allows those responsible for developing similar training programs to capitalize on the experience of many other training programs, both in terms of what to teach and how to teach it.

The basis for STEM is competency-based training. Competency-based curricula differ from more traditional curricula in two major respects. First, competency-based training relates content directly to job performance. Only skills and knowledge which can be directly beneficial to the graduate in the performance of his or her job are included. In contrast, traditional curricula generally attempt to establish a knowledge base. The student then draws from this knowledge to perform his job. This knowledge may or may not be relevant to the job requirements. The second distinguishing factor is the evaluation procedure. The desired outcomes of training are known to the student upon entry and his successful completion of the program is based upon the attainment of these competencies (1).

Active student participation in the learning process is useful in accomplishing the objectives of competency-based training. Thus, there is great emphasis placed on active learning. Active learning experiences are designed to increase student motivation, improve retention of learned information, and prepare students for evaluation.

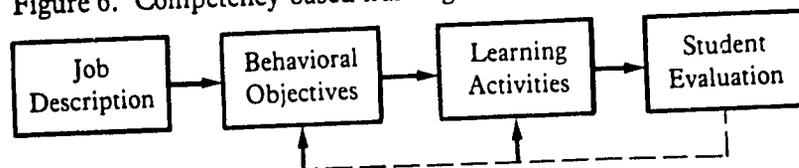
It is quite easy to have a training program with a curriculum that contains considerable irrelevant material and at the same time omits some essentials. Most of us know this from personal experience. The *raison d'être* of competency-based training is to attempt to prevent this from occurring.

Competency-based training essentially is a systematic way of designing and implementing an instructional program that *prepares the trainees to demonstrate job-related competencies by achieving specific behavioral objectives*. This is shown graphically in figure 6.

First, a job description is created. Using this job description as a basis, the objectives for the training program are identified. Learning activities are then determined that are most appropriate for preparing students to meet the objectives. Finally, the students and the training program are evaluated by determining how well the students have met the behavioral objectives. The findings of the evaluation are then fed back to appropriately modify the behavioral objectives and/or learning activities.

Our need for such a systematic approach to developing and implementing a curriculum for nonphysician providers of health services became very apparent several years ago. At that time, the HMDS had operational responsibility for the MEDEX/Pacific training program in Micronesia. Consultants from the various districts throughout Micronesia were used as periodic lecturers. This was essential for the program but posed problems of coordination and standardization of content, teaching techniques, and evaluation of students. The modules, adaptation process, training trainers workshop, and implementation program mentioned earlier have all evolved out of this experience in Micronesia and our subsequent re-

Figure 6. Competency-based training.



relationships with three other programs. These latter programs are: the Lampang Health Development Project, Lampang, Thailand; the MEDEX/Guyana Program, Georgetown, Guyana; and the Basic Health Services Program, Islamabad, Pakistan. Our experience with each of these programs has been very helpful in the development of the system. And the process is continuing!\*

Figure 7 represents in outline the activities and materials included in the System for Teaching Essentials to Medex. The remainder of this chapter consists of descriptions and examples of each of the elements included in the boxes.

### 1.0 Job Analysis

Competency-based training is essential to STEM. And job analysis is essential to competency-based training. The concept of a job analysis is quite simple. One merely analyzes the component parts of a job. In practice, it is considerably more complicated. But, once it has been completed, it proves to be very useful.

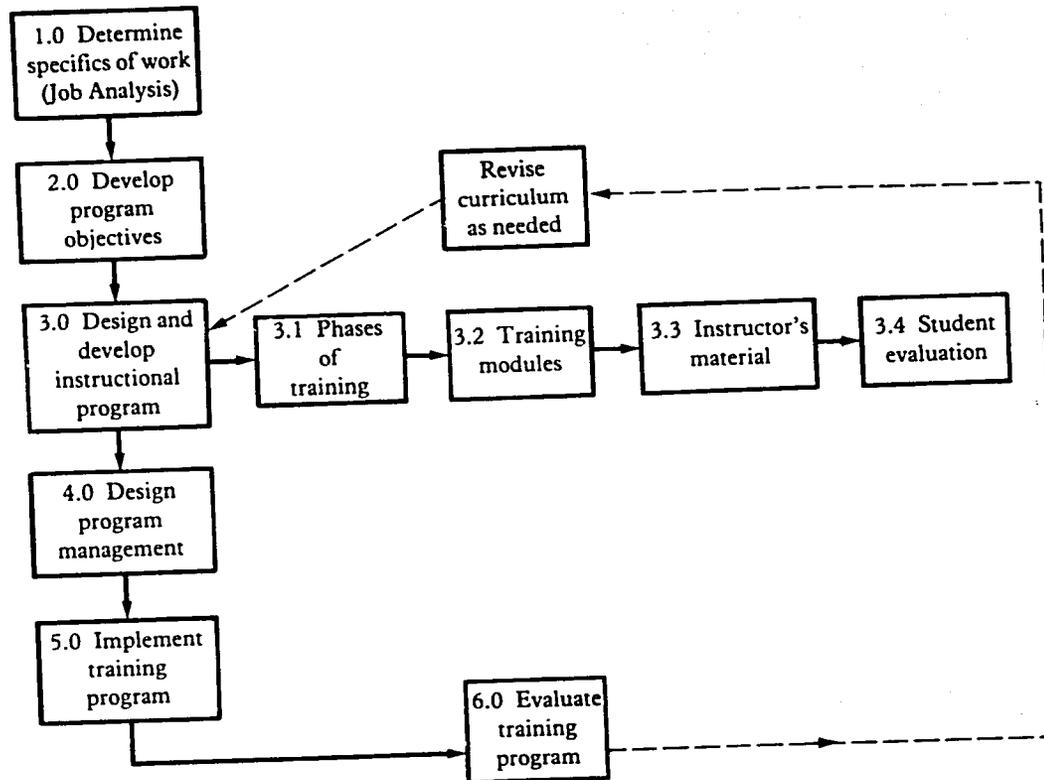
The ideal method of performing a job analysis is to systematically observe and record the functions carried out by someone performing the job; however, there have to be assurances that the job is being correctly performed. This requires considerable time and experience to do accurately. An adequate substitute is to talk with people who perform the job, their supervisors, and co-workers. Our experience with the latter approach indicates that resulting inaccuracies can be corrected. A further complication in regard to MEDEX training programs is that no such job may exist in the area. There is then an obligation to create a job description based upon a combination of experience in other areas and knowledge of local conditions.

An analysis of a job requires that it be separated into its component parts or subdivisions. Any number of terms have been used to refer to the subdivisions of a job. We have chosen four relatively standard terms: task, duty, skill, and knowledge.

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\*The same approach to training is being used to develop training modules for the more peripheral basic/village/community health workers (CHWs).

Figure 7. Plan for training program.



Tasks are the major subdivisions of a job. They explain at a glance the work to be done by someone performing this job. They are stated in general terms. They set the boundaries of what is to be expected.

Duties are the subdivisions of tasks. They lay down in more specific terms what a person holding a job will be doing to accomplish the tasks involved. Stated in behavioral terms, duties are equivalent to program objectives for the training course. As will be discussed later, this duty/program objective interface has been chosen to bridge the gap between the job description and the objectives for the training program.

Skills and knowledge are further subdivisions of the job. Skills in STEM modules refer to discrete psychomotor functions. They are teachable, observable, usually involve some type of physical manipulation, and require practice. Knowledge refers to information one has acquired. It does not itself involve physical manipulation. However, knowledge is prerequisite to the performance of observable functions; for example, knowledge of a drug's actions is necessary in order for one to prescribe that drug correctly.

The prototype job description has been divided into the following tasks:

- I. General clinic
  - A. Diagnose and manage common skin problems
  - B. Diagnose and manage common EENT problems
  - C. Diagnose and manage common problems of the respiratory system and heart
  - D. Diagnose and manage common problems of the gastrointestinal system
  - E. Diagnose and manage common genito-urinary problems
  - F. Diagnose and manage common infectious and chronic diseases
  - G. Diagnose and manage common emergencies and injuries
- II. Maternal and child health
  - A. Diagnose and manage common obstetrical and gynecological problems

- B. Diagnose and manage common problems of infants and children
  - C. Organize and conduct prenatal and postnatal services
  - D. Organize and conduct child care services
  - E. Organize and conduct family planning services
  - F. Assist midwives with deliveries when necessary
- III. Community health
- A. Organize and conduct a program to evaluate and promote improvement of community sanitary conditions with emphasis on drinking water, excreta and waste disposal, and insect vectors
  - B. Organize and conduct a program to evaluate needs and promote improvement of community family planning and practices
  - C. Organize and conduct a program to evaluate and promote improvement of community food and nutrition conditions
  - D. Organize and conduct a program for collecting and reporting health statistics.

Each task is further divided into the duties it comprises. For example:

Task: Organize and conduct child care services

#### Duties

- 1.0 Participate in a program of disease prevention by immunization
- 2.0 Prepare and maintain adequate weight records to identify high-risk children
- 3.0 Participate in a program of nutritional preventive care

And last, the skills and knowledge that comprise the individual duties are listed. Examples of each are shown below.

Task: Organize and conduct child care services

Duties: Participate in a program of disease prevention by immunization

### Skills

- 1.1 Give the following immunizations:

tuberculosis	tetanus
diphtheria	polio
whooping cough	smallpox
- 1.2 Record immunization information on a child's clinic record

### Knowledge

- 1.1.1 Immunization procedures
- 1.1.2 Types of immunizations
- 1.1.3 Recommended age for immunizations
- 1.1.4 Care and storage of vaccines
- 1.1.5 Possible side effects and/or cautions

Defining a job in detailed and explicit terms is time consuming, particularly if no job description exists (it is much less of a burden if it is done by adapting an already existing job description). It pays great dividends either way to have a firm basis upon which to develop a precise, sound, and relevant curriculum.

Two concepts that can be viewed as further extensions of an explicit job description warrant mentioning at this point; they are discussed again later. They are protocols and high-risk factors. These define in very explicit terms how a mid-level health worker is to solve certain clinical as well as preventive health problems he or she will routinely face. By extending the two interrelated concepts of protocols and high-risk factors to most, if not all, aspects of the work of health center personnel, the tasks required of the personnel can be standardized to meet local needs. Appropriate criteria can then be applied to verify that trainees are competent to perform these tasks.

One final word about the job analysis for someone dealing with people and their health problems. The foregoing discussion may appear very mechanical and impersonal. However, it is clearly recognized that the human qualities of compassion and concern cannot be mechanized and programmed. Trainee selection plays an important role in this dimension of the job.

## 2.0 Develop Program Objectives

The job analysis process described above is the first step in developing a competency-based training program. After the component parts of the job are clear, the process of defining the training objectives becomes relatively simple. The duties, skills, and knowledge included in the task analysis form the broad programmatic guidelines, or objectives, upon which the training is based. This prevents the inclusion of irrelevant materials and at the same time assures that all important objectives are covered. Program objectives assist in the organization of the curriculum and the development of appropriate curricular materials. In addition to program objectives, specific objectives are also necessary for development of the program. Specific objectives are a clear description of what the students will be able to do at the conclusion of each learning session. All objectives, whether programmatic or specific, are stated as observable actions to the student. Together the programmatic and specific objectives form a framework that describes the training program and assures its relevance.

The program objectives are included in each module in the form of the task analysis table. Tables 1 to 3 have been selected to provide examples of program objectives from three different modules: (1) Eye, ear, nose, and throat, (2) Maternal and child health, and (3) Community nutrition.

## 3.0 Design and Develop Instructional Program

### 3.1 Phases of Training

The STEM training program is currently divided into three phases: module, rotation, and preceptorship, plus continuing education. During the module phase of training, students focus on mastering the skills and knowledge presented in the modules, and a variety of learning activities are used primarily in a classroom setting. During the rotation phase, students are trained in patient management skills as they rotate through a series of outpatient clinics. The third phase is the preceptorship. During the preceptorship, students hone their skills and learn to function in their actual job situation under close supervision. These three phases ap-

**TABLE 1. EENT Module: Task Analysis**

**TASK: Diagnose and manage common problems of the eye, ear, nose, and throat.**

Program Objectives		
Duties	Skills	Knowledge
1.0 Do a medical history and physical examination on every patient with EENT complaints, using the diagnostic protocols as guidelines.	1.1 Use of diagnostic protocols for EENT complaints 1.2 Physical exam techniques. Examine eye, ear, nose, throat.	1.1.1 How to use diagnostic protocols for diagnosis of EENT problems. 1.2.1 Anatomy and physiology of eye, ear, nose, and throat.
2.0 Determine the most likely of the following diagnoses: tonsillitis      iritis URI (viral)      glaucoma foreign bodies      conjunctivitis CA esophagus      otitis media corneal ulcers      gingivitis trachoma      ulcerative gingivitis	2.1 Physical exam. -examination of eye for pupil size, shape, and light reflex. -examination of eyes for signs and location of inflammation. -use of fluorescein stain paper for location of corneal ulcer or laceration. -conduct hearing test.	2.1.1 Pathophysiology of EENT. 2.1.2 General considerations and clinical picture of listed problems.
3.0 Manage the above problems using the management protocols as guidelines. Management includes: initial treatment, referral, follow-up treatment, and prevention.	3.1 Management procedures. -irrigation of eye. -search for and removal of foreign body from eye or throat. -administer eye drops, eye ointment, and application of eye patch. -dry swabbing of draining ear. -control of anterior nosebleed.	3.1.1 How to use management protocols for EENT complaints. 3.1.2 Management for EENT problems.

**TABLE 2. Maternal and Child Health Module: Task Analysis**

**TASK: Organize and conduct child care services.**

Program Objectives			
Duties	Skills	Knowledge	
1.0 Participate in a program of disease prevention by immunization.	1.1 Give the following immunizations: -tuberculosis -diphtheria -whooping cough -tetanus -polio -smallpox 1.2 Record immunization information on a child's clinic record.	1.1.1 Immunization procedures. 1.1.2 Types of immunizations. 1.1.3 Recommended age for immunizations. 1.1.4 Care and storage of vaccine. 1.1.5 Possible side effects and/or cautions.	
2.0 Prepare and maintain adequate weight records to identify high-risk children.	2.1 Weigh and/or measure an infant/child. Correctly maintain a weight chart.	2.1.1 Normal and abnormal growth patterns.	
3.0 Participate in a program of nutritional preventive care.	3.1 Identify high-risk children.	3.1.1 Factors that tend to identify high-risk children in a specific community.	
4.0 Manage common ailments referred by school health program.	4.1 Diagnose/manage patients referred by school health program.	4.1.1 Factors that cause common ailments. (see: Infants & Children)	

**TABLE 3. Community Nutrition Module: Task Analysis**

**TASK: Organize and conduct a program to evaluate and promote improvement of community food and nutrition conditions.**

Program Objectives		
Duties	Skills	Knowledge
1.0 Provide nutrition information and guidance to the following groups: -newborns -young children -older children and adults -women during pregnancy/lactation -ill people	1.1 Obtain pertinent dietary information. 1.2 Evaluate dietary history. 1.3 Chart findings in medical record. 1.4 Counsel patient. 1.5 Demonstrate feeding a child with the use of a cup and spoon. 1.6 Demonstrate the preparation of Super Porridge. 1.7 Demonstrate the preparation of Salt-Sugar Medicine. 1.8 Teach the nutrition lessons with the use of the flip charts.	1.2.1 Minimum dietary requirements. 1.2.2 Different phases in life. 1.2.3 Basics of good dietary habits. 1.6.1 The recipe for making Super Porridge. 1.7.1 The recipe for making Salt-Sugar Medicine. 1.8.1 Major points in each lesson. 1.8.2 Appropriate audience for each lesson. 1.8.3 Meaning of nutrition/malnutrition. 1.8.4 Basics of good dietary habits. 1.8.5 Functions of food in the body. 1.8.6 Basic food groups according to function of food in the body. 1.8.7 Different phases of life. 1.8.8 Different dietary needs at different phases in life. 1.8.9 Advantages of breast feeding. 1.8.10 Alternative for breast feeding.

pear particularly well suited to training programs within the public sector of health care services.

Most of the U.S. MEDEX Programs (MEDEX/Northwest, Seattle, Washington; MEDEX/Intermountain, Salt Lake City, Utah; etc.) have only two phases of training. The first is a "didactic" phase (corresponding to the module phase), and the second is the "preceptorship." The preceptorship in this case is on-the-job training with a physician in private practice. More than 90% of the medex have been employed by their preceptors after completion of the training program. This pattern is well suited to the U.S. system of predominately private medicine.

In the MEDEX/Pacific Program, Micronesia, this scheme was changed somewhat to fit that Pacific community's particular needs. With the exception of a few supervisory medex who would be working part of the time in the district hospital, Micronesian students were trained to work on outer islands usually by themselves. In that situation, it was totally impractical to consider an on-the-job preceptorship as in the U.S. MEDEX programs. Consequently, a rotation preceptorship was established for the students. During the nine-month preceptorship phase, students rotated to a different district hospital every three months. At each preceptorship site the student was under the supervision of a new preceptor. The third and final rotation was to the student's home district. The rationale for setting up a rotation preceptorship included the following reasons:

1. Some districts have a smaller patient load than others and, as a result, offer less clinical exposure for the students.
2. The doctors had varied interests and skills in different medical fields, such as pediatrics, gynecology, and so forth.
3. Some doctors are more skilled at precepting than others.

This solution was workable. It was a major, albeit necessary, compromise of the principle of a preceptorship inasmuch as the students were never precepting under conditions similar to their eventual job situation—the essence of a preceptorship.

The Lampang Health Development Project in Thailand elected

to establish a series of hospital and health center rotations which are supervised by doctors. However, the health center rotation also involves working under graduate medex and other personnel stationed in the field. This health center rotation puts the essence of precepting back into the program. That is, the students are trained part of the time under their actual working conditions (2, 3, 4). The Guyana and Pakistan MEDEX-type programs are using variations of the phased approach that suit the specific program needs of the countries (5, 6).

Continuing education is very important and should not be forgotten. Planning and budgeting for continuing education should be included in the design phase of the program:

There is no substitute for periodic in-service training. The time spent for the in-service training will be more than compensated for through increased wisdom and skills of the workers. . . . (7)

Continuing education material is developed using the module format. Such training is necessary if the program is to remain dynamic. The tasks of the medex will change as government priorities, health problems, community needs, equipment, and supplies are altered. The subsequent addition of new health care tasks and duties will require additional training. Further, there is inevitably some deterioration of previously learned knowledge and skills over the years. Lest we forget, this is true for all levels of personnel from top to bottom!

### 3.2 Training Modules

Competency-based training was selected as the preferable training approach since the tenets of this approach are most congruent with the educational philosophy held by the Health Manpower Development Staff. Modules were chosen as the format for material presentation since modules allow for fulfillment of many of the competency-based tenets.

The following review of competency-based training guidelines and module format and methodologies demonstrates the relationship between competency-based training and modules.

### Competency-Based Training Guidelines (8)

1. The competencies to be demonstrated are job derived, specified in behavioral terms, and made clear to the student.
2. Evaluation criteria are competency-based, specify mastery levels, and are available to the students.
3. Evaluation requires performance as prime evidence of capability; also, takes student knowledge into account.
4. Student's progress rate depends upon demonstrated competency.
5. Instruction program facilitates development and evaluation of specific competencies.
6. Systematic design is used to account for each training factor.
7. Student learning opportunities are individualized, i.e., student experiences are determined by the student's learning needs.
8. Overall efficiency and effectiveness of learning is assured by students becoming actively involved in the learning process.

### Modules

1. Module content is developed based upon objectives that are derived from job analysis. These objectives are presented in the students' module text.
2. Modules contain specific statements of performance and knowledge criteria.
3. This is incorporated in the training program design, not specifically a module feature. Evaluation materials are included in modules—performance rating sheets and written exams.
4. This feature has been incorporated into the program design. Student evaluation criterion referenced, not normative.
5. Instructor's manual provides lesson plans developed to meet program objectives and competencies.
6. Modules are convenient tools for presenting material in a systematic fashion.
7. Modular training materials contain alternative training strategies.
8. Module materials provide a range of learning experiences and emphasize the importance of active involvement in learning. Instructors' material contains lesson plans that emphasize maximum student involvement in learning activities.

Modules can, of course, be organized in a great variety of ways. The community health worker modules presently being developed by the Health Manpower Development Staff, for example, have different design elements but are based upon the same competency-based training principles.

The following section describes how materials are organized, developed, and compiled into prototype or generic STEM training modules. These modules, the System for Teaching Essentials to Medex, form the basis of a curriculum for training mid-level health workers specifically for working in rural areas of developing countries. Future publications will describe the less complex training modules being developed for CHWs.

The prototype STEM modules that have been developed thus far are:

#### MODULE LIST

##### Core skills

1. Anatomy and physiology
2. History
3. Physical examination
4. Statistics
5. Causes of diseases

##### General clinics

6. Skin problems
7. EENT problems
8. Respiratory system and heart problems
9. Gastro-intestinal tract problems
10. Urinary system problems
11. Chronic diseases
12. Dental problems
13. Generalized infections and other medical conditions

##### Trauma and emergencies

14. Trauma
15. Emergency

**Maternal and child health**

16. Problems of pregnancy and reproduction
17. Child care
18. Problems of infants and children
19. Family planning
20. Prenatal and postnatal care

**Community health**

21. Community environmental health
22. Community family planning
23. Community nutrition

**Management**

24. Mid-level health worker\*

Individual STEM modules are organized in the following manner:

- I. Module text
  - A. Student guides
  - B. Content presentation
  - C. Skill descriptions
  - D. Review exercises
  - E. Protocols
  - F. High-risk factors
  - G. Skill rating sheets
- II. Instructor's material
  - A. Instructor's manual
  - B. Audio-visual training supplements
  - C. Evaluation materials

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\*The development of management modules is consuming an increasing amount of HMDS efforts. Management modules for professional supervisors and management support specialists (e.g., finance, personnel, supply, etc.) are also being developed.

**I. Module Text**

The module text is an instructional text that presents the student with selected knowledge as one of the programmatic learning activities. This knowledge is presented as written or audio-visual material. Reading the module text and doing the recommended review exercises are prerequisite to additional learning activities involving the same content.

**A. Student Guides**

Each module contains a set of student guides (table 4). The major purpose of the student guides is to inform the student about the training process and the learning expectations. The guides help to alleviate student anxieties about the "new" training approach and, in addition, they make the desired outcomes of the training process most explicit.

TABLE 4. Student Guide

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**UNIT II**

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**SHOCK DUE TO EXTERNAL BLEEDING****I. Entry level skills and knowledge:**

Before starting this unit, you should be able to:

- A. Describe the function and identify the anatomical structures of the circulatory system.
- B. Take and record a patient's history (review: Medical history module).
- C. Perform and accurately record the findings of a patient's physical examination (General review: Physical examination module. Specific review: General appearance, p. 8; Vital signs, pp. 8-12).

**II. Objectives:**

Using the information and experience provided by the instructor and the module text, you will be able to:

TABLE 4. (Continued)

A. Diagnose a specific problem and accurately identify the correct management steps when evaluating the patient in shock due to external bleeding (protocol #3, p. 33; quick reference, p. 33.1).

B. Demonstrate the following in a simulated exercise:

direct finger pressure	elevation
pressure dressing	applying a tourniquet
pressure point	

### III. Evaluation:

Upon completion of the module, you will be assessed on:

A. Knowledge: written test based upon contents of unit in module text. Acceptable performance, 80%.

B. Skills: How to use diagnostic and management protocol #3.

How to control bleeding by:

direct finger pressure	elevation
pressure dressing	tourniquet
pressure point	

IV. Activities you will be participating in to complete the unit objectives:

A. Participate in slide presentation concerning control of bleeding.

B. Participate in large and small group discussion.

C. Participate in simulated exercises.

### B. Content Presentation

The content of the modules has been drawn from a wide variety of international sources. These sources include professional journals, books, and unpublished training manuals from various programs around the world, as well as the personal experiences of the HMDS and our consultants.

The format followed for the content presentations depends upon

the primary focus of the module. In the more clinically oriented modules, the diseases included are considered individually in the module text. Each "disease description" provides information necessary to understand the cause of the problem, identification of the problem, and management of the problem. In several modules, including those covering problems related to the skin, urogenital system, abdomen and chest, there is also brief discussion of the pathophysiology of the organs involved.

The format for module content presentation is:

- General considerations
  - Introduction
  - Cause
  - Epidemiology (if brief, include here and omit below)
- Epidemiology
  - Geographic distribution
  - Time distribution
  - Age distribution
  - Mode of transmission
- Clinical picture
  - Abnormal signs and symptoms
  - Course
  - Complications
- Management
  - Initial
  - Extended
  - Complications
  - Prevention (if brief, include here and omit below)
- Prevention

In the prevention-oriented modules, the guidelines for general considerations and epidemiology remain about the same. In using the Community Environmental Health Module as an example, the clinical picture is changed to the identification of the high-risk community and management becomes management of the high-risk community with such subheadings as:

- a. Prioritizing high-risk communities
- b. Priorities within the high-risk community
- c. Adapting high-risk community priorities

#### C. Skill Descriptions

Each module has a number of techniques and procedures that need explanation and practice. Such techniques and procedures are categorized as diagnostic, therapeutic, or preventive. In the skill descriptions section, written information, drawings, graphs, and pictures are included to assist the student in learning a particular technique or procedure.

#### D. Review Exercises

At varying intervals in the module text, review exercises are given to help the student focus on the most important points being presented. Selected review exercises will later serve as parts of the written posttest. Since the point is not to try to "trick" students but to help them learn specific information, they are told that some of the review exercises will be used in the posttest. Instructors should explain and discuss any review exercises that the students may have difficulty in answering.

#### E. Protocols

Protocols are explicit diagrams that assist in diagnosing or managing common clinical or community health problems. Like the rest of the module components, protocols must be adapted to include the common problems of a given country. They are designed to be a quick and easy reference.

Protocols (flow charts, clinical algorithms) are decisionmaking aids that standardize the diagnostic and management process and serve as standing orders for the medex. Considerable investigation of the use of protocols has been undertaken in recent years. Most of this work has been done in technologically developed settings (9, 10, 11). Some investigation of the use of protocols has also been undertaken in developing countries (12, 13). The results have been impressive. Considerable work remains to be done in establishing a systematic method for developing protocols that are country-

specific. Examples of diagnostic, management, and environmental health protocols are shown in figures 8 through 10.

#### F. High-Risk Factors

High-risk factors, as the name implies, are conditions which, derived from the patient's medical history or obtained from the physical examination, indicate that the patient is at greater risk of developing some significant health problem. For example, pregnant women of short stature are at greater risk of developing outlet obstruction at the time of labor than are taller women. Therefore, short stature and other standardized high-risk factors are made a focus for prenatal care. Morley advocates the same principle with the use of the well-known Road to Health Chart (14). Using this chart, clinic or dispensary personnel can identify those children who are still in the early stages of malnutrition. By identifying problems early and taking the necessary steps to interrupt their progression, more serious illness can be prevented.

#### G. Skill Rating Sheets

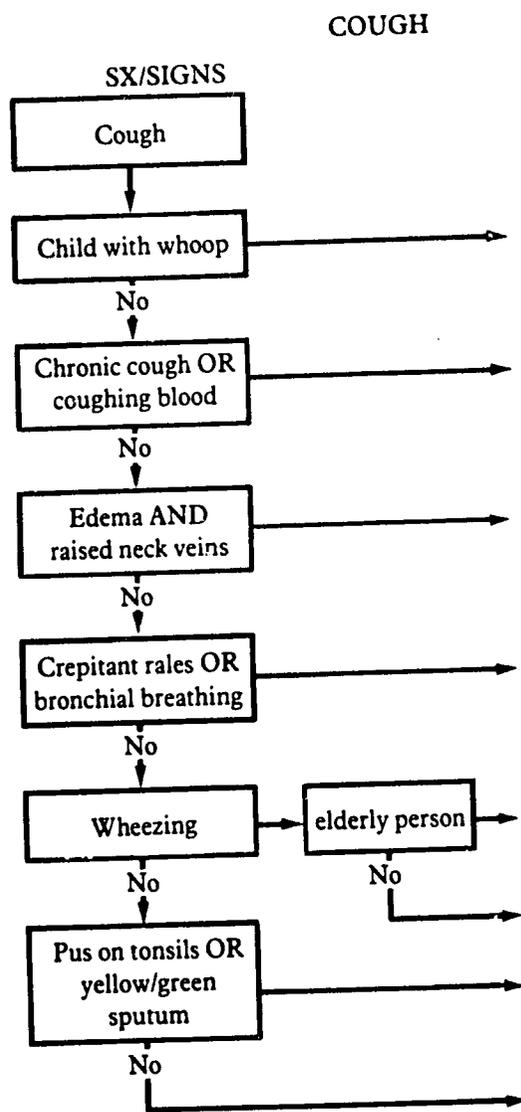
Major emphasis is placed on performance evaluation. For each skill covered in a module, there is a rating sheet (figure 11). These sheets contain guidelines for the assessment of a student's skills. The total points received by the trainee on a skill evaluation must equal or surpass a predetermined level. Rating students against a standard increases the objectivity of the evaluation procedure.

### II. Instructor's Material

#### A. Instructor's Manual

The instructor's manual contains objectives, teaching schedules, and a series of teaching plans (figure 12). The manual provides the instructor with information that he or she will need in order to conduct the learning activities of the modules. Learning activities are instructional events of a training program that assist the student in meeting learning objectives. The most desirable learning activities suggested in the lesson plans are those that promote active student participation.

Figure 8. Diagnostic protocol #5.



PROBLEM	MANAGEMENT PROTOCOL	MODULE
Whooping cough	#17	Problems of Infants and Children
TB	#21	Chronic Diseases
Congestive heart failure	#33	Chronic Diseases
Pneumonia	#4	Respiratory System and Heart Problems
Chronic bronchitis and emphy- sema	#28	Respiratory System and Heart Problems
Asthma	#28	Respiratory System and Heart Problems
Bacterial URI	#16	EENT Problems
Viral URI	#16	EENT Problems

Figure 9. Management protocol #21.

### NEWBORN SEPTICEMIA

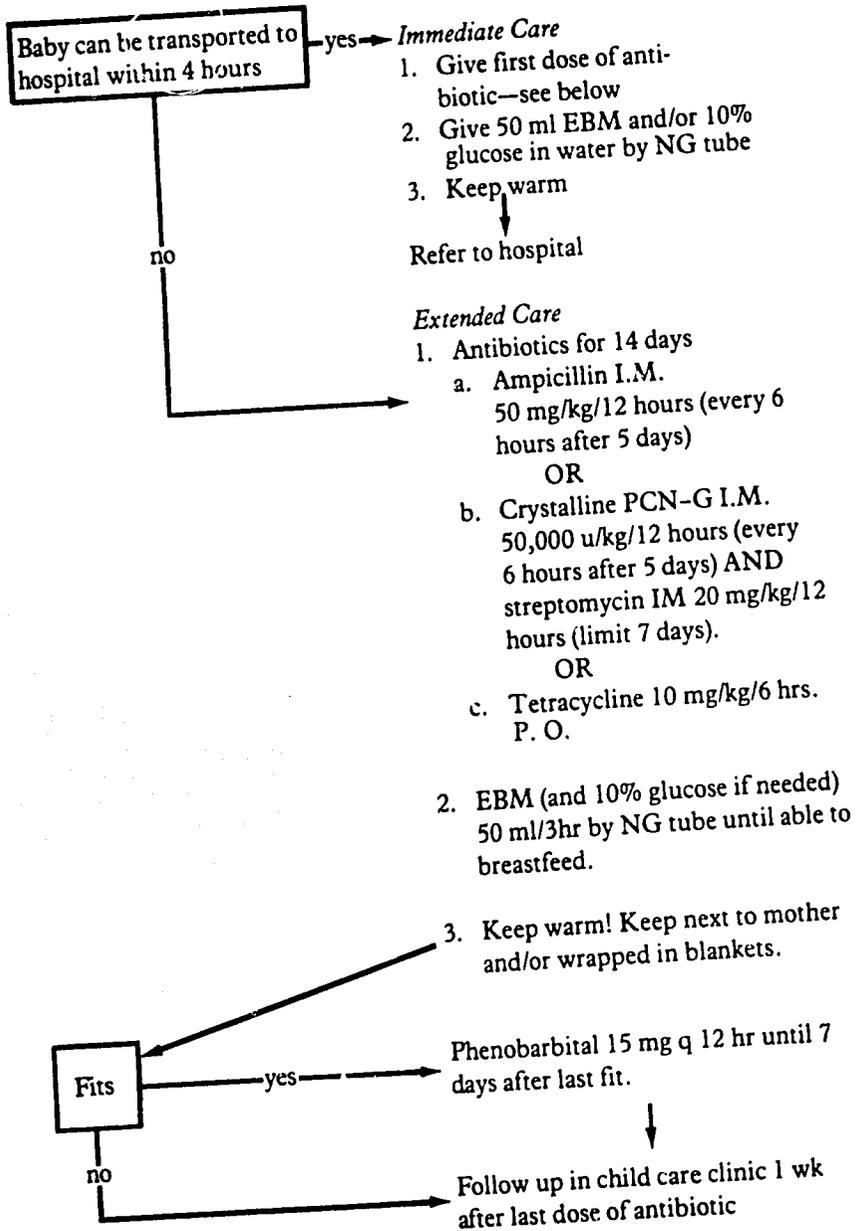
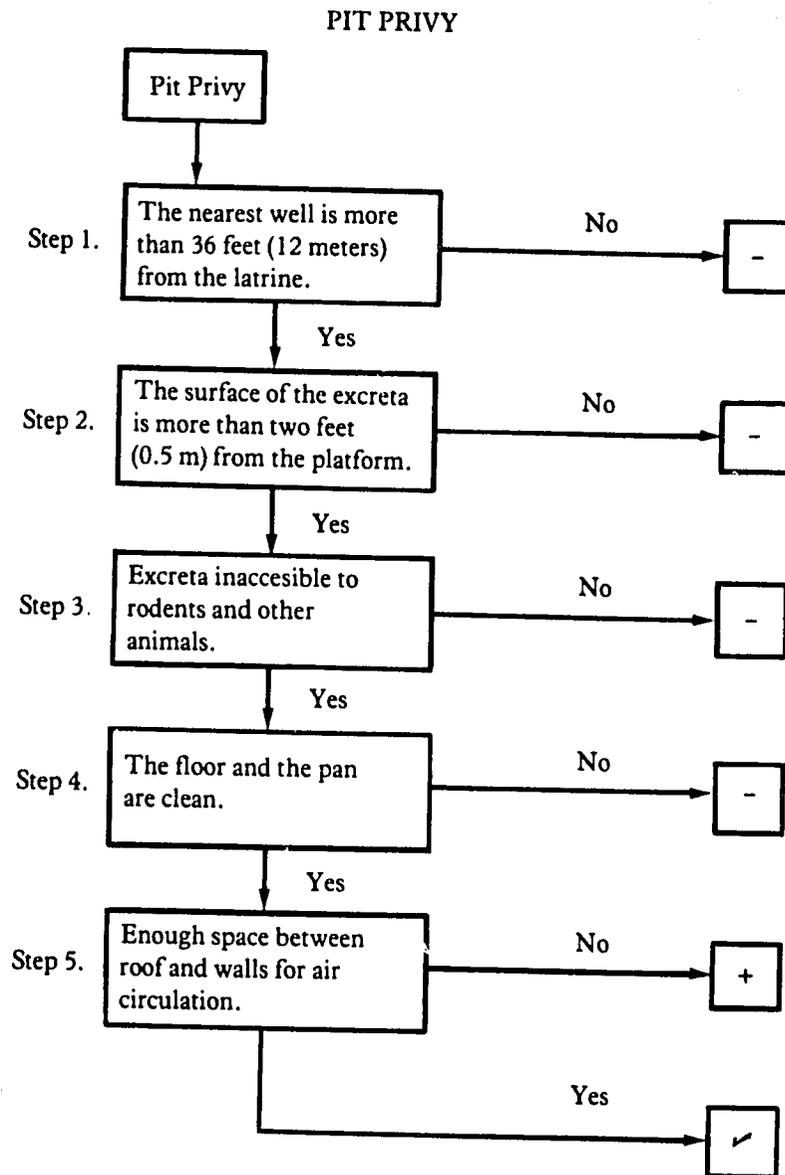


Figure 10. Diagnostic protocol #41.



Key: (-) not acceptable; (+) acceptable; (✓) ideal

Figure 11. EENT skill rating sheet.

Rating key: +1 = adequate  
 -1 = inadequate  
 0 = not applicable

	+1, -1 or 0	Comments
1. Collection of needed supplies.		
2. Patient comfort.		
3. Examination of conjunctiva. Eyes compared.		
Exam of conjunctiva of lower lids.		
Exam of conjunctiva of upper lids.		
Exam of conjunctiva around iris.		
4. Examination interpretation.		
5. Record of Examination.		
Date:		
Total Score:		
Pass level: 6		

Evaluator: \_\_\_\_\_

Competency-based training by definition puts a strong emphasis on action by the students. It requires students to actively demonstrate their ability *to do* things. This is with good reason. Active participation in meaningful learning experiences that are job related aids in retention of learned information and skills (15).

Figure 13 illustrates the scale of learning activities from the most abstract at the bottom to the most concrete at the top. In the following paragraphs, these learning activities and their usefulness in training health workers are discussed.

*Direct Experience.* Direct firsthand experience is a very powerful method of learning. It is the epitome of "learning by doing." One

Figure 12. EENT teaching plan.

Session 3

Topic: Foreign body in the eye

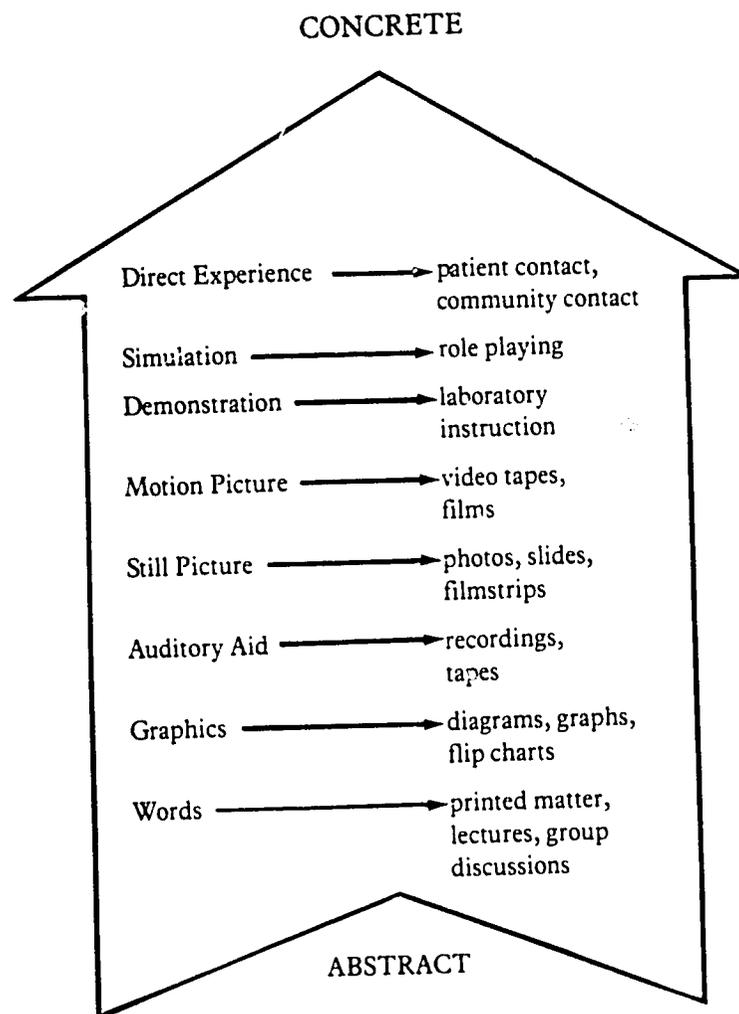
- Objectives: Using the information provided by the instructor or the module text, each student will:
1. Demonstrate the proper procedure for locating foreign body in eye
  2. Demonstrate the proper procedure for removal of foreign body from eye through:
    - a. eye irrigation, or
    - b. use of cotton tipped applicator
  3. Apply ointment and patch to the affected eye

Methods: Self-instruction, A-V presentation, class discussion, demonstration, practice of skills

Materials: Module text, answers to questions, A-V presentation, materials necessary to perform demonstration

Time—3 hours	
<b>Procedure:</b>	
<b>Preparation:</b>	
Review A-V presentation.	
Gather materials for demonstration.	
<b>Learning activities:</b>	
Students read module text on foreign body in the eye, pp. 24–29, and answer review questions.	30 minutes
Instructor presents A-V presentation on the removal of a foreign body.	30 minutes
Instructor conducts discussion session eliciting student questions to clarify module text and slide presentation.	30 minutes
Instructor demonstrates the procedure for locating and removing foreign body from eye.	30 minutes
Students work in pairs to practice the procedure demonstrated above. Instructor observes and assists in practice.	1 hour

Figure 13. Scale of learning activities.



point on which there is widespread agreement is the need for supervised practical experience. However, in order for direct experience with patients and communities to be most effective, it must be well organized, have clear and measurable objectives, and allow students to gradually take increasing responsibility. One cannot simply send students to a busy clinic or out into a community without adequate preparation and supervision.

During the module phase of training, the students can be introduced in the classroom to this type of learning activity by means of demonstrations with patients. Skills that can be mastered during large-group exposure and practice through direct experience can also be covered during this phase of training.

During the rotation phase of training, the number of direct experience learning activities increases with more patient and community contact. Finally, in the preceptorship phase of training, this type of learning activity predominates; under the supervision of preceptors, the student must synthesize previously mastered skills in a job setting that will closely resemble his eventual placement.

*Role Playing.* Role playing has two major advantages. First, the students can practice a specific skill in a simulated setting as many times as necessary before performing the skill as a direct experience activity. Second, situations that are present infrequently during a direct experience activity can be simulated, for example, medical emergencies and community interaction situations.

As a technique, role playing has been especially useful in the training of such skills as taking medical histories, counseling patients, and organizing community groups, where social interaction is an important element. This activity is like a play where two or more students take on different identities depending upon what is being taught. However, the instructor must make sure the students understand the purpose of role-playing activity since this may be an unfamiliar concept in some cultures. This is best accomplished by a demonstration from the instructor and the use of written scripts.

*Demonstration.* The demonstration of specific skills to be mastered by the students is a major responsibility of the instructor or preceptor. This technique is often introduced during lectures,

simulations, or direct experience learning activities. The students must have a clear understanding of how a skill is to be correctly performed and this requires one or more demonstrations of the skill. This type of learning activity is also a good tool to use for generating questions from the students. This is especially true when the students clearly understand that they in turn will be required to perform correctly the skill being demonstrated.

#### B. Audio-Visual Training Supplements

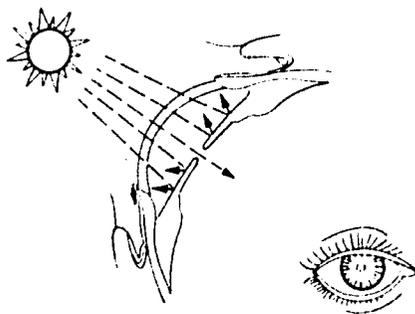
Whenever possible, materials are developed to assist the instructor in his or her presentation of the content. Audio-visual materials serve to offer additional learning experiences for students, but their use is dependent upon local resources. Examples of the types of media incorporated into modules are:

1. Thirty-five millimeter slides
2. Flip charts
3. Overhead projections
4. Posters
5. Audio-cassette tapes (alone or in combination with thirty-five millimeter slides)
6. Video-cassette tapes
7. Super-8 millimeter film
8. Black and white photos

There is often a temptation to use visuals that are already available and the text material or script is then written to support the available visuals. To avoid such a temptation when incorporating visuals into the module text or supplementing the module with an audio-visual presentation, the following guidelines have proven helpful:

1. The presentation should meet an established objective of the training program.
2. The text material or script should be written *before* identification or design of appropriate visuals.
3. Each visual should represent only one idea (e.g., figure 14).
4. Simple line drawings are most effective for text visuals, graphs, overhead transparencies, and flip charts.

Figure 14. Physiology of the eye.



*When there is too much light, the iris makes the pupil smaller.*

5. Visuals should be designed so that one drawing can be used with many different types of media formats.

Thirty-five millimeter slides, with or without an accompanying audio-cassette tape, have become a very popular and relatively low-cost medium for use in training. This type of medium can also be used as a self-instructional learning activity for the student.

Many visuals, such as ones showing an inflamed throat, the anatomy of the heart, or a mosquito breeding area, can be shared by many programs. However, just as the module texts are written as prototypes, so too are the visuals designed as prototypes to be adapted. The amount of adaptation required depends not only on changes made in the module texts but also on language, cultural, and racial variations. Time, cost, and locally available technology and expertise are also factors determining the amount of audio-visual adaptation or development that takes place. Collaboration among rural-oriented health programs in the development and exchange of material and ideas is being promoted through an audio-visual training program which will be discussed later in this chapter.

#### C. Evaluation Materials for the Module Phase

Evaluation materials include both written and performance evaluation. A written pretest and posttest are provided to evaluate the knowledge of the student prior to the module presentation and the

knowledge gained by the student as a result of the presentation. The questions included in the module posttests are derived from the instructional objectives. The test items sample a range of cognitive skills with emphasis on application of knowledge. The form of the questions is usually multiple choice or short answer. These questions are being field tested now to determine their effectiveness in discerning what learning has taken place. When test questions reliably identify areas of student weakness, remediation is more effective. Analysis of tests will also identify those questions that are ambiguous, too easy, or too difficult.

Rating sheets have been developed to help the instructor assess students' skill performance and to provide students with meaningful feedback (figure 11). The students are prepared to enter the rotation phase when they have successfully completed the written posttests and skill performance evaluations.

### 3.3 Student Evaluation

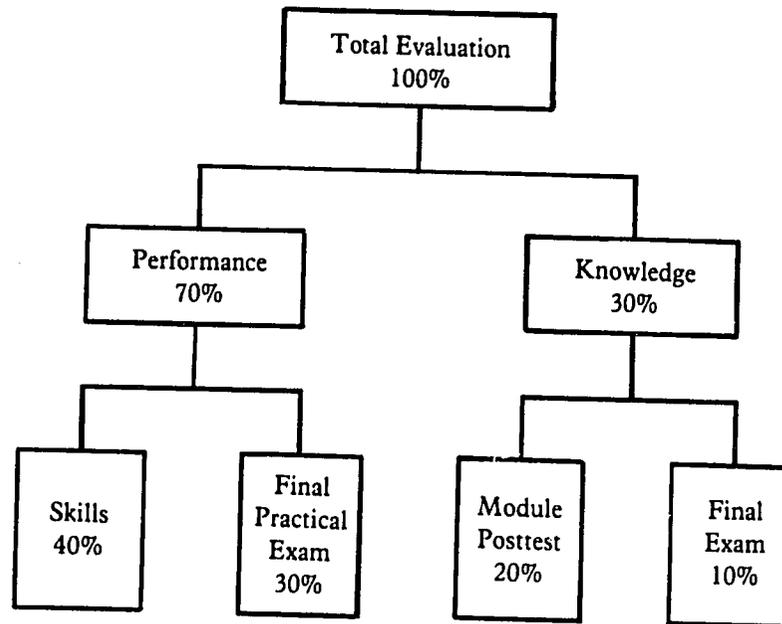
Since the focus of competency-based training is on performance, the emphasis in student evaluation is also on performance. The skills necessary for successful job performance are identified as objectives in the job analysis. This establishes the minimum level of acceptable student performance. The student receives the objectives at the onset of training and the training assists him to acquire these skills. The knowledge necessary for job performance is also identified in the job analysis in order to provide the student with a clear understanding of the knowledge requirements of training.

Student evaluation for all phases of training is heavily weighted to reflect the performance orientation of competency-based training. The successful completion of skills accounts for 70% of the final student assessment; 30% of the total evaluation is based upon the knowledge component. These requirements are shown in figure 15.

#### A. Student Evaluation Tools

During each phase of training, the students' success in fulfilling the stated training objectives is measured. Frequent assessment of students provides them with feedback about their progress and pro-

Figure 15. Student evaluation components.



vides instructors with insight into student deficiencies. If an individual student falls below the established standard, he is retrained since attainment of the skills and knowledge that comprise the job is a prerequisite of job performance. If most of the students are experiencing difficulty in achieving the standard, the training methods and module materials should be reviewed.

The following evaluation tools are used during training:

1. Module phase
  - a. Written tests of knowledge
  - b. Performance ratings of skills
2. Rotation and preceptor phases
  - a. Record of clinical and preceptorship experiences
  - b. Evaluation of performance by observation

**B. Skill Evaluations**

Under the heading of skills are included: (1) Physical examination techniques; (2) Physical examination discriminations; and (3)

TABLE 5. Examples of Skills

*Laboratory*

Reagent tests for sugar, proteins, ketones in the urine  
 Preparation of sputum slide for identification of AFB using ZN stain  
 Reagent tests for hematuria, proteinuria, and bile  
 Preparation of thin and thick blood smear for malaria exam

*Physical Exam Techniques*

Adult physical, general  
 Inspect abdomen  
 Palpate abdomen  
 Percussion of abdomen  
 Auscultate abdomen  
 Palpation/percussion of the loin for deep kidney pain  
 Palpation/percussion of the lower abdomen for bladder tenderness and bladder size  
 Rectal exam  
 Pelvic exam  
 Breast exam  
 Abdominal exam

*Patient Management Procedures*

Clean and bandage lesion  
 Apply hot soaks/saline soaks  
 Incise boils  
 Remove warts  
 Performance of dental extractions and treatment of postextraction complications  
 Demonstration of proper dental hygiene  
 Irrigation of eye  
 Search for the removal of foreign body from eye, ear, nose, and throat  
 Administer eye drops, eye ointment; application of eye patch

*Physical Exam Discriminations*

Abnormal pupil size, shape, and light reflex  
 Signs and location of inflammation of eye  
 Jaundice  
 Bulging fontanelles  
 Ascites

TABLE 5. (Continued)

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Enlarged spleen and liver
Stiff neck
Levels of consciousness
Enlarged thyroid gland
Bulging eyes
Paralysis of one or more limbs

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Management procedures. These have been identified during task analysis as essential to job performance (table 5). Each program selects those skills that are appropriate for its medex to achieve. They then determine when each skill will be evaluated, that is, during module, rotation, or preceptorship phase. These decisions are based upon, among other things, the length of the training phases, patient availability in clinical settings, and number of staff available to supervise and evaluate performance. The skills usually selected for assessment during the module phase are those encountered in routine clinical situations. Perfection of these basic skills will make the student more useful during his rotation and preceptorship and allows him to spend his time learning to provide integrated diagnostic and management care to patients.

During the rotation and preceptorship phases of training, the students take increasing responsibility for maintaining records of their experiences. In order to facilitate this, the requirements of the rotation and preceptorship are explained. The student is then expected to take the responsibility for being assessed on his accomplishment of these skills. One format for obtaining and recording student experience is shown in figure 16.

#### 4.0 Design Program Management

In the preceding sections, we have described competency-based training and the process of developing a curriculum for a MEDEX-type training program. For ease of presentation, this has all been discussed without emphasis on the practical issues of managing a

Figure 16. Student experience record.

**INSTRUCTIONS FOR THE STUDENT:**

1. Keep this booklet with you all the time for a record of your progress.
2. It is your responsibility to be certified on all the requirements listed in the booklet.
3. Be sure to have your preceptor CHECK and initial each requirement upon completion (except for the protocol list).
4. Each week show this booklet to the training staff so that your progress can be recorded.

PROBLEM	No. Req.											Make a "✓" when req. completed	
		1	2	3	4	5	6	7	8	9	10		
Strep throat													
Viral URI													
Influenza													
Bronchitis													
Pneumonia													

HAVE PRECEPTOR DATE AND INITIAL EACH PROBLEM SEEN

SKILL	No. Req.											Make a "✓" when req. completed	
		1	2	3	4	5	6	7	8	9	10		
Recognizing abnormal breath sounds of wheezing													
Recognizing rales													
Recognizing irregular heart rate													
Recognizing heart murmurs													
Detection of enlarged thyroid													

HAVE PRECEPTOR DATE AND INITIAL EACH SKILL SEEN

training program. The problems associated with actually operating a training program, however, greatly influence curriculum-related decisions. This section addresses some of the aspects of operations and coordination that require early attention in order for the program to proceed as smoothly as possible.

#### TRAINING STAFF

To date, doctors have been the most logical and available pool of potential trainers. They are accustomed to being called upon for training paramedical staff and are usually quite willing to take the responsibility. Competency-based training, though, does require some changes in the traditional role of the trainer. Our experience has been that, once mastered, this new role provides greater rewards than the old methods.

Since the doctors involved in training usually have other responsibilities, it is necessary to have fulltime program managers to coordinate training and training support activities. The coordinator should work with these other physicians, including the classroom, rotation, and preceptorship phase instructors, to assure as well-coordinated an operation as possible.

#### STUDENT SELECTION

One of the problems that has great impact on training and that needs further exploration when considering training in developing countries is the choice of selection criteria, that is, who is to be trained (16).

Wen and Hays have reported on the procedures used in China for selection of barefoot doctor candidates (17). The Chinese believe that the selection procedure is more important than the training. The major responsibility for selection is given to the community in which the barefoot doctor will serve after training. The single most important selection criterion used by the community is the presence of an altruistic personality.

In 1974 Behrhorst reported a similar community-based selection process in Guatemala (18). The American experience in selection of physician assistants contrasts with the community-based selection

process. Crovitz, Huse, and Lewis at Duke University found SAT\* scores to be the best predictor of a successful trainee and, therefore, the best selection criterion (19).

The glaring differences in the approach to selection in the United States, China, and Guatemala are not surprising. They reflect the social structures of the countries. The problem is that most developing countries are not structured closely enough to any of these countries to allow wholesale adoption of selection criterion. Therefore, it is wise for each country carefully to assess selection criteria in search of those that have the potential to identify successful trainees.

The experience of HMDS has been that most programs consider both points of view when establishing selection criteria. This is encouraging since reports support the notion that increasing community involvement in selection of trainees increases community acceptance of trained workers. This is especially true of CHWs when they return to their communities.

The minimal level of academic and experiential achievement considered necessary for successful completion of the program is reflected in the modules. The modules have been written as prototypes with the expectation that both content and level will be adjusted when they are adapted into a specific training curriculum.

Selection is a difficult issue that is often not resolved within the first few classes of a new training program. There is a tendency to overload the initial classes of a training program with students who are atypical. The best and brightest are often chosen to carry the banner of a new program. This skewing of the student profile can result in upgrading the curriculum to include a great deal of information that is superfluous to the performance of the job. Consequently, when the more typical students are recruited, they may do poorly and further curriculum revision may be required.

Selection criteria assist in sorting applicants to determine those considered most likely to succeed in the training program and on

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\*Scholastic Aptitude Test: standardized tests of cognitive abilities used to predict general academic achievement.

the job. Naturally, the students in the early classes will be the source of baseline information about the most desirable qualities for future students. Refining and validating the selection criteria cannot occur until after the first few classes are trained and functioning at their health posts.

#### SCHEDULING

A complete but flexible schedule of the entire training program needs to be worked out as early as possible. This should be the responsibility of the program manager but coordination with all instructors including the preceptors is essential.

#### BUDGETING

In many instances, the program manager will have responsibility for expenditures. He will need to purchase equipment and office supplies. He will often also be responsible for the salaries of some of the support personnel. This necessitates budgeting and book-keeping chores.

#### OFFICE MANAGEMENT

Under this heading, we are including all the various daily responsibilities that go into the operation of an organization. The most important of these areas is personnel management. Support personnel must be recruited, selected, and trained. Operational procedures have to be worked out and defined during periodic staff meetings. Other more minor factors include: maintaining supplies, periodic inventories, student record keeping, student housing, and lastly maintenance of all facilities and supplies owned and/or operated by the program.

#### MANAGEMENT EVALUATION

One of the primary functions of a manager is to monitor or evaluate the effectiveness of the system including the personnel for which he has responsibility. This evaluation function has two major components. One is to monitor the system on an ongoing basis and make adjustments accordingly. The other is to undertake major

periodic evaluations of the program with a view towards possible major revisions. Both should be an integral part of the program with ample advanced planning.

#### PROGRAM MANAGERS TRAINING

The natural focal points for preparing training program administrators are curriculum design and instructor orientation. As we have pointed out above, however, there are several other aspects that must be planned for. These are the management and coordination functions. They are somewhat less obvious than curriculum development and instructors training but are nonetheless essential to a successful program.

In order to help prepare program administrators to assume responsibility for these functions, we have prepared a short workshop format and manual. Using the case study method, this workshop provides the managers with practical experience in program planning and problem solving based upon the foregoing considerations.

#### 5.0 Implement Training Program

To assist in the implementation of medex training, HMDS has developed a series of workshops that address the issues of implementation. These include (1) Curriculum Adaptation Program, (2) Instructors Training Program, and (3) Audio-Visual Development and Training Program.

#### CURRICULUM ADAPTATION PROGRAM

It was stated previously that the STEM modules will virtually always require some degree of modification. This not only entails the adaptation of the curriculum to fit local health problems but also takes into account available facilities, logistical support, supervision, other health workers and programs, as well as community attitudes toward health and disease.

Thus far in our experience, the adaptation process has been facilitated through the use of a series of curriculum adaptation workshops. These workshops, varying in length from one to six weeks, have been conducted in several different countries as well as in Hawaii (20).

The revision of the task analysis tables is the first and one of the most difficult steps in the curriculum adaptation process. Once the revised task analysis tables are completed, they serve as the foundation and guide for revising the rest of the module content.

Figure 17 gives an idea of the types of activities occurring in a typical curriculum adaptation workshop. The amount of work completed during the workshop depends upon the length of the work-

Figure 17. Curriculum adaptation workshop activities.

Outcomes	Means	Methods
Job analysis for male/female mid-level health worker	Review and revise task/duty/skill lists developed in manpower workshop	Group participation in HMDS job analysis process
Revision of protocols	Determine frequency of problem specific to country/regions	Analysis of survey data
Outline of training module content and instructional sequence of modular and preceptorship phases	Analyze information regarding training time, facilities, and staff; Establish training priorities and prerequisites; Eliminate training overlaps	Group discussion with policy makers countrywide and regional
Adaptation of existing instructional module texts	Review existing modules: revise objectives, eliminate inappropriate materials, add country-specific information, revise language	Group training in construction of behavioral objective process of module text construction
Development of module text materials	Objectives, protocols, skill identification and module text framework provided: Core and general clinics—male MDs, MCH—female MDs and LHVs community health, population—sanitarians, nutritionists	Performed individually or in small groups; Consultation provided at specified intervals

shop, the number of participants, and the amount of curriculum revision required. At the very least, a good start can be made and, more importantly, a group of people will be formed with the experience to be able to continue the process afterwards in their own country.

#### INSTRUCTORS TRAINING PROGRAM

The individuals who are responsible for actually conducting the training program need to become familiar with the curriculum and the training methods involved prior to beginning the program (21). Doctors should participate in the adaptation of the modular curriculum and also should be included among the instructors of the first (and perhaps the second) group of medex. Thereafter, carefully

Figure 18. Instructor training activities.

Outcomes	Means	Methods
Develop learning activities for modules: Self-instructional units—A-V Classroom demonstrations and discussions Clinical site training	Review objectives and select appropriate instructional modes	Demonstration and practice in the development and use of various learning activities
Develop instructor's manual for module	Review format and content of lesson plans and additional instructor aids	Group training/practice in the development and use of instructional guides
Develop student evaluation instruments	Review existing evaluation instruments; select and design knowledge and performance measures	Group training/practice in development and use of instructional rating scales

selected, experienced medex make superb instructors. It is ideal if the curriculum adapters and the initial instructors are the same people. Even if this is not the case, the instructors should be allowed some flexibility concerning both curriculum content and teaching methods. If they are the same people, then curriculum adaptation and instructor training can occur simultaneously. Regardless, figure 18 indicates the important points to be covered during instructor training.

#### AUDIO-VISUAL DEVELOPMENT AND TRAINING PROGRAM

As mentioned earlier, a four- to six-week course has been developed to support audio-visual personnel associated with MEDEX-affiliated training programs. This course is designed to strengthen the audio-visual teaching materials included as a part of the STEM modules. By expanding the network of programs producing and testing high caliber audio-visual aids, each program gains access to an ever increasing array of useful audio-visual material. The course outline is shown in figure 19.

#### 6.0 Evaluate Training Program

The aim of all evaluation procedures is to increase the effectiveness of training, thereby improving the chances of developing a health worker who is capable of successfully performing his job. In keeping with this axiom, the best way to evaluate the effectiveness of training is to observe and interview the graduates at their work. The graduates will help to identify the discrepancies between what was taught and what is needed in the community. The training materials can then be revised to include the necessary knowledge and skills.

Valuable feedback about the success of the training program is available even before the graduates begin their work. This information, although not as powerful as identification of discrepancies between training and job, can be very helpful in assessing the existing curriculum materials and training methods. The students are again a most useful source of information for program evaluation.

Assessment of the group progress during training will help to identify curriculum elements that are not effectively taught. In ad-

Figure 19. Audio-Visual course outline.

Unit	Objective	No. of Days	Coordinator(s)
A	Define the need and use for learning activities given the objectives of the various STEM training modules.	2-3	MEDEX training staff
B	Plan a specific learning activity that involves the use of audio-visual teaching aids. Preferably, this would involve an A-V medium that the trainee is less familiar with than with others.	7-8	HIRU* staff
C	Produce the A-V presentation itself.	5	HIRU staff
D	Plan for (and in some instances carry out in Honolulu) postproduction duplication, evaluation, and dissemination of the A-V presentation materials.	3	HIRU staff
E	Identify the resources, i.e., equipment, supplies, space, and personnel, necessary for the development of further A-V productions for his/her own training program. This will entail listing out these resources with an eye to how each can be obtained.	2	HIRU staff
F	Maintain and make minor repairs on the equipment listed as part of Unit E.	2	HIRU staff

\*HIRU: Health Instructional Resource Unit, John A. Burns School of Medicine, University of Hawaii, Honolulu, Hawaii.

dition, interviews with students about their training experiences give some indication of the methods and content that are most effective. Interviews with students also help to identify successful training methods.

Instructors are an important source of information about program status. Interviews and observations provide information that helps in curriculum revision. The following examples of student and instructor questionnaires illustrate the kind of information that is useful for program evaluation and revision (figures 20 and 21).

Figure 20. Instructor's questionnaire.

Module Title: \_\_\_\_\_

Teaching Time (days): \_\_\_\_\_

Since you have taught a module you can provide valuable information about its usefulness. Please answer the following questions about your experience while teaching medex trainees. The information you provide will be used to improve training materials and methods.

This questionnaire is divided into five sections. Each section concerns a portion of the training module.

- I. Module Text
- II. Audio-Visual Aids
- III. Instructor's Manual
- IV. Teaching Methods
- V. Tests

Some questions are followed by a scale which is numbered 1 to 10; one is the lowest, ten the highest. Put an X on the position on the scale that describes your experience concerning the question. Some questions require that you circle YES or NO. Some questions ask for comment. If you wish to comment about something not included in questions, please put comments on back of page.

I. Module Text

1. Estimate the percent of students who read the module text before they came to class. 1 ++++++|+++++ 10  
Low High
2. Estimate the percent of students who answered the questions. 1 ++++++|+++++ 10  
Low High
3. How useful were the questions that were included in the module text in helping the student focus on important information? 1 ++++++|+++++ 10  
Low High
4. How appropriate was the information given in the module text? 1 ++++++|+++++ 10  
Low High
5. How well do you think the students understood what they read in the module text? 1 ++++++|+++++ 10  
Low High
6. How appropriate was the language level of the module? 1 ++++++|+++++ 10  
Low High

COMMENT: \_\_\_\_\_  
\_\_\_\_\_

Figure 21. Student's questionnaire.

Module Title: \_\_\_\_\_

Teaching Time (days): \_\_\_\_\_

Please answer the following questions about your training experience. The information you provide will be used to improve training materials and methods.

This questionnaire is divided into four sections. Each section is about a portion of the training module.

I. Module Text

II. Audio-Visual Aids

III. Teaching Methods

IV. Tests

Some questions are followed by a scale which is numbered 1 to 10; one is the lowest, ten the highest. Put an X on the position on the scale that describes your experience concerning the question. Some questions require that you circle YES or NO. Some questions ask for comment. If you wish to comment about something not included in questions, please put comments on back of page.

I. Module Text

YES NO

1. Did you read the module text before the instructor discussed the information in class?

YES NO

2. Did you answer the questions in the module text?

3. How useful were the questions that were included in the module text?

1 ++++++ 10  
Low High

4. How well did you understand what you read in the module text?

1 ++++++ 10  
None All

1 = understood none

10 = understood all

5. Rate the level of the vocabulary in the module text.

1 ++++++ 10  
Easy Difficult

1 = too easy

10 = too difficult

6. Rate the effectiveness of the drawings and pictures included in the module text in helping you to learn.

1 ++++++ 10  
Low High

### Experience to Date

By June of 1977, three programs—the MEDEX/Pacific Program (Micronesia), the Lampang Health Development Project (Thailand), and MEDEX/Guyana—had actually utilized competency-based modules to train mid-level health workers. In these programs, student and instructor acceptance of the modularized material and methods has been high.

Two additional programs in Pakistan and Colombia have recently begun the process of adapting more recent revisions of the modules to suit conditions in their respective parts of the world.

STEM modules were first tried in the MEDEX/Pacific Program in 1974. The results were favorable enough to pursue (22, 23).

The first program to completely adapt modularized instruction to train MEDEX-type health workers (*wechakorn*) was the Lampang Health Development Project. The results prompted the following remarks in a recent description of the program:

Currently, there are over 20 training modules which have been developed in the Thai language. Over the past two years, these have been reviewed, revised and refined by a wide range of Thai medical educators, physicians, and consultants. Recently, the Ministry of Public Health created a policy supporting the training of paraprofessionals and there is considerable interest to use the *wechakorn* [medex] competency-based curriculum and training modules. Development of new cadres of community health paraprofessionals from a variety of health personnel types is feasible with competency-based training. All students completed the one year training successfully and achieved comparable results on their written and clinical skills final examination. (24)

In Micronesia, the MEDEX training program ended after an adequate number of medex had been trained. The modular format was refined, adapted, and employed in retraining programs for health assistants in several districts (health assistants are the most peripheral community health workers in the Micronesian system).

Over the past two and a half years, a number of major changes in

both the content and the format of the prototype modules have taken place. The current versions are soon to be employed (as always, after appropriate adaptation) in the programs in Guyana and Pakistan. Development of both these programs is currently well underway. Another program, the Lofa County Health Project (Liberia), which includes a physician's assistant training program that has been in operation for ten years, is considering a major revision of their curriculum based upon the STEM module format.

Finally, a discussion of our experiences would be incomplete without stressing our recognition of the major contributions of those responsible for the five programs mentioned above in reviewing and assisting HMDS in revising the prototype or generic modules. This cooperation is part of a dynamic adaptability in the approach to primary health care that is reflected throughout this book.

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CHAPTER 6

# Primary Health Care Program Operations

*Mona R. Bomgaars*

## Introduction

As is clear throughout this volume, primary health care programs in the developing world vary from country to country, depending on local conditions. Handbooks designed for specific countries have been published (1, 2). The purpose of this book, however, is to share experiences that we have grouped as guidelines. An in-depth look at management problems in primary health systems will be the subject of subsequent HMDS publications. Despite local differences, certain universals govern the operation of rural primary health care delivery programs.\* These include:

Assessment and adjustment

Logistical support: personnel, drugs, equipment, facilities, financing, management information systems, transportation, and communication

Interfaces

Processes

Community relations and the community health worker

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\*Maurice King's *Medical Care in Developing Countries*, Oxford University Press, 1966, continues to be one of the best source books for clinically trained doctors concerned with the management of rural health centers.

In this chapter three operational levels of administration are assumed: the national or provincial level, the district level, and the rural health unit. The rural health unit has responsibility for delivering health services to a population of five thousand to twenty thousand in a defined geographical area. The district level is concerned primarily with the management of patient referrals in hospitals and the supervision of rural health units. The national or provincial level sets policy and is concerned with the overall administration of health services.

### **Assessing the Existing Environment**

Whether a program is new or evolving, there is a point at which trained personnel, physical resources, and facilities begin their functions. At the outset, these resources (personnel, drugs, equipment, and facilities) interact with the existing environment (villagers, culture, communities). To manage the program, adjustments to the environment will be necessary. If a program is well designed, the planning and training phases will decrease the required changes. However, some alterations always will be necessary. Before making these adjustments, it is essential to assess the environment and existing resources as compared to the planned situation.\* This process, which leads to decisions resulting in necessary adjustments, can be called operational assessment. Because the environment and program resources are dynamic and ever-changing, operational assessment needs to occur frequently and expeditiously and result in action-oriented decisions.

Operational assessment must be performed on at least two levels—the national or provincial level and the health unit level. At the national or provincial level, a panel of health experts can be organized to meet regularly. Members may include faculty from training institutions, private health practitioners, public health of-

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\*As an example, the planning stage of a program may recommend externally supplied supplementary foods. The author worked in such a program where spoilage and irregularity of supply led to the reassessment of services given to undernourished children and resulted in services utilizing locally available foods.

ficials, evaluators and statisticians from other disciplines. These experts are requested to add their empirical observations to the assessment process. Health experts from other countries can also provide added dimensions. The panel often is organized in a manner similar to boards in community centers and hospitals and it is given additional tasks regarding the setting of policy (3, 4). The operational assessment should be done on a month-to-month basis and followed by operational decisions and adjustments. Scheduled panel meetings at three- to six-month intervals will help regularize the decisionmaking flowing from monthly operational assessments.

At the rural health unit level, a community panel may assess traditional customs and practices affected by health unit activities and the acceptance of new health practices by the community. Assessment also may be conducted by the newly trained health unit staff. (Health team meetings including all levels of staff are an effective administrative tool for planning and implementing program services.) The staff will have certain expectations concerning the number of drugs, supplies, and forms that should be in the health unit, and if these expectations cannot be met, the program must be adjusted accordingly. Similarly, the rural health unit staff observes the community and its response to health services. Differences inevitably will arise between expectations and actualities. It is on the basis of these differences that operating priorities will be determined.

### **Logistical Support**

#### **PERSONNEL**

Staffing was discussed from the point of view of program initiation in the earlier chapter on implementation. Under ideal situations, the staff that manages the health care program also will be involved in the planning and training components of the program. In such instances, the operational supervisors and administrators will have participated in designing job descriptions. They also will have had some responsibility in selection of staff and setting salary levels. In selecting and deploying staff, a chief goal should be to choose persons who are well motivated and committed to serving rural people

(5). However, in real life this is indeed rare; often personnel are deployed according to training background and civil service ranking rather than motivation for service.

Whereas demonstration projects (including projects operated by voluntary and private organizations) are able to select highly motivated and specifically qualified persons, a nationwide program must function with ordinary persons in staff positions. An important aspect of the supervisor's responsibility is to motivate the operating staff, because effective motivation is critical to optimal operations.

Personnel replacement is an ongoing managerial responsibility. Direct supervisors of staff should, if possible, have the final word in selection. Enlisting community participation in the selection with the final determination left to the direct supervisor may be the most effective approach.

Supervision includes encouragement, motivation, and technical training, as well as administrative facilitation and performance evaluation. Supervision is critical to the successful operation of primary health care programs at every level, and without it staff performance and program operations will deteriorate. Supervision can be organized through community-based committees or through individuals especially trained for their tasks such as the supervisory medex\* (6, 7).

At higher levels of administration, committees advising health service departments may provide the supervision required. Their meetings may also afford a specific time for the panel form of evaluation, as well as the sharing of technical expertise and encouraging support from superiors and peers.

Financial support of personnel is basic to any program. Salaries

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\*Doctors should have special training in management and supervision if they are to function effectively as members of the health team devoted to primary health care. For detailed information on the supervision of medex and CHWs, see the manuals listed as the first two references at the end of this chapter. Fendall's *Auxiliaries in Medicine* and the WHO document, "Working Group on Training for Supervision," WHO/EDUC/73, 1969, are recommended for further guidance in the area of supervision.

arriving at regular intervals, retirement and savings benefits, and leaves for life crises are essential. The best way to pay salaries may be from a decentralized source by a supervisor knowledgeable about staff leaves and status. Assignment of salary rank based on the social values of the country is another basic requirement for insuring satisfactory staff performance. Side benefits such as travel allowance and daily allowances (TA/DA), and a rural allowance (RA), are significant and visible financial additions to a rural health care delivery program. The manipulation of the RA or the TA/DA either toward a blanket increment raise in salary or separation into daily incentives is often used to aid in maintaining motivation.

#### MATERIAL RESOURCES (Drugs and Equipment)

A system to ensure ample supplies of drugs and equipment should be simple and efficient. If planning has been properly conducted, a prescribed medical formulary and a list of equipment necessary for operations at each level will be available. It then becomes a matter of ensuring that these materials are present when needed and are used as intended. Simple but adequate inventory and request forms, appropriate transportation mechanisms, storage facilities, and efficient supply personnel located centrally and peripherally can result in a distribution system for needed supplies that enables health professional personnel to deliver services optimally to their target communities. Standardization of supply procedures aids the internal management of the system.

In a national program, the deployment of material resources will involve the manufacture or importation, storage, and dispersion of sufficient quantities of drugs and equipment. Climatic considerations may determine the timing of manufacturing, storage, and dispersion because certain drugs deteriorate in hot or humid climates. An organized process will ensure the regular dispersal of drugs and equipment. At predetermined intervals, the requests should originate at the rural health subcenter (health post) level. After receiving the requests, the materials should be promptly dispersed. This routine is predicated upon an efficiently functioning peripheral-central-peripheral communication and transportation system.

Amendments to the medical formulary will be required as manufacturers vary their products and costs. The formulary also will be altered as superior drugs are found and as drugs formerly imported are produced locally. Technical modifications within the system such as a change in the recommended drug list or the source of ordering may be made at yearly intervals, with suggestions originating from health professionals and the manufacturing community. Development of a select list of necessary yet low-cost drugs and equipment and their regular dispersement does much to ensure the availability of resources for an entire program.

Simple security systems are required. These may consist of locks on boxes, signatures required at the packing and receiving sites, and rules that include return of broken equipment for repair or replacement. These minor, although easily ignored measures, often result in increased staff respect for drugs and equipment at all levels and eventually a significant budget reduction. On the other hand, complicated security systems may result in a paralyzed system with resources remaining within locked cupboards.

#### FACILITIES (rural health units, offices, hospitals, staff quarters)

Facilities are provided to aid in the objectives of the program and should be maintained in styles that contribute to their intended function. If the facility is rented, rent monies require dispersement at regular intervals. The landlord usually takes responsibility for maintenance. If the facility is owned by the health department, the department will require a maintenance support system for those necessary repairs that will invariably arise. Regular whitewashing and painting of the facility aids in prolonging the life of the building as well as improving its appearance.

Daily cleaning in health facilities must consider communicable disease control as well as aesthetic appearance. Animals are excluded from facilities in order to control communicable diseases. Families contributing to nursing care and providing a humane atmosphere in the inpatient facilities should be protected against dangerous infectious diseases. Exposing a patient to contamination from family members may also be a concern; however, isolation is

rarely necessary to the extent practiced in some urban-based tertiary care hospitals.

Responsibility for providing cooking, eating, and sleeping areas for families may be the responsibility of individuals, may be given on contract, or may remain the responsibility of the health department. In either of the latter two cases, these facilities require sanitary supervision by health personnel.

Common to many rural health units is the provision of staff quarters. The maintenance of these buildings is similar to that of the health unit itself, except that daily cleaning tasks are most often the responsibility of the occupants.

A night security system is usually required for all facilities. Locks on the doors and a nightwatchman are common. The nightwatchman is often expected to act in the role of a night triage officer, messenger, and emergency aide.

#### TRANSPORTATION

Transportation of personnel and resources consumes much administrative time in many rural health programs. Initially, rural health services begin in geographical areas that lack such services as all-weather negotiable roads and public transportation. Therefore, four-wheeled vehicles or plane services are included in the health unit package. Maintenance is expensive and requires considerable time and energy. After a rural area develops, all-weather roads are completed and public transportation becomes available. At this point public transportation often is more economical for a health program than private transportation and also more reliable—given the usual vehicle breakdowns and the unauthorized use of the vehicle for non-health-related tasks.

Conversion to a public transport system is not without its difficulties. Personnel and systems often regard vehicles as prestige symbols and resist any change. The use of less expensive bicycles and motorized bicycles has been a successful compromise in some countries. The bicycles are given to individual staff for both work and personal use—the latter as a side benefit. Maintenance is a personal responsibility (8).

Geographical restrictions may limit the use of any mechanized form of transportation. High-altitude populations rely on walking and on human or animal carriers. Island populations are restricted to boats. The mobility of people and of health professionals is greatly influenced by climatic conditions, and this directly affects the definition and management of serious illness. What may be a manageable medical or surgical emergency in one geographical setting may be a fatal disease in another—merely because of transportation differences.

#### COMMUNICATION

Essential to the operational phase of the program is the continuation of a receptive framework. This is as important at the high political decisionmaking level as at the community level. The community level assumes greater importance during the operational phase since political decision makers receive support and feedback from their community during this phase.

On the macrolevel the actual distribution of improved services should be supported by a public relations effort that includes newspaper, radio, and (if appropriate) television reports of services provided (see also chapter three). These reports publicize the number of patients seen in specific health units, the number of recent graduates of a training program being deployed in the rural area, and anecdotal reports of health unit functioning. On a microlevel, the community is made aware of the actual functions of the health post in their areas when health workers visit and live in their communities, and when patients attend the clinics. Actual community involvement becomes the greatest source of positive public relations at the village level.

Other forms of linkage are required to ensure the freest possible communication between components of the health service system. The means will vary from country to country and region to region. Telephone, shortwave radios, and couriers are most common. These three systems are functional if they are maintained in technical working order and if reliable personnel are available as senders and receivers. Although the courier system is usually more time-

consuming than the other systems, it often is more reliable and results in a written record of the communication. These systems must be designed for emergencies as well as for routine use.

#### FINANCES

By the time operations begin, a budget and a method of recording and reporting expenditures should have been established. It is the responsibility of those in charge of operations to remain within the presented budget. This can be done by dividing the yearly budget into quarters or some other selected period and restricting the designated expenditure within this time frame.

Delayed release of operating funds by the central government is a common problem in nationally financed health programs. These are politically sensitive problems but it is essential that they be expeditiously solved. Laying the initial groundwork of ensuring a national commitment for primary health care services will aid greatly in minimizing bureaucratic inertia.

If the program is based on fees for service, additional staff, record keeping, and security systems are needed at each health unit. National insurance may or may not exist, but when it does, it usually is separated from service units' technical functions.

#### MANAGEMENT INFORMATION SYSTEMS

Information systems can collect a variety of information. The types of information might include:

1. Operational information: that data concerned with the operational aspects of the program—finances, personnel, drugs, supplies, repairs.
2. Health information: that information involving the health status of individuals and communities, for example, information relating to environmental, nutritional, and immunization levels.
3. Medical care information: that data involving individual patients and their disease-related needs.
4. Statistical information: a subdivision of any of the above categories involving the numerical manipulation of data.

It is important to plan for the different types of information that will be used. Further, the data collected should be only that data necessary to fulfill specific objectives.

Management of a primary health care system requires information in all four categories described above. This information must be recorded, stored, referable, and retrievable for future operational decisions. The information recorded must be adequate for decision-making at all levels, as well as for the many aspects of supervision. In record keeping, there are two extremes. In one, except for daily enumeration, there are virtually no records. In the other, there are registers, cards, and file folders on every patient, all requiring special storage rooms. Such extensive records are rarely, if ever, recalled. Each program must determine the volume of information needed for operational decisionmaking, for referral, for higher-level decisionmaking, and for endpoint evaluation. The records system thus is based on the minimal number of forms needed to collect essential data. A regular review to allow for appropriate changes is essential. This review can be added to the tasks of the expert panel.

The number of patients receiving services at a health unit and their classification by age, sex, residence, and diagnosis are data on demand and utilization that are required for monitoring the health care system. The actual clinical history and physical examination is often collected and given to the patient on a card he or she may keep. Patient-retained cards are useful in maternal and child health activities and in care of chronic diseases such as tuberculosis, leprosy, and diabetes. However, if data is required from these cards for national decisionmaking, an additional form should be kept at the health unit.

Records of drug and equipment inventories will provide a basis for financial analysis per health unit. An ongoing manpower inventory also contributes to the financial analysis.

As a practical management tool, a modification of the inventory may be used to some advantage. This approach—"the grocery shopping list approach"—is based on making lists of tasks to perform and checking them off as completed. The tasks may be performed in order of importance.

### **Interfaces**

#### WITH OTHER HEALTH AGENCIES

The importance of effective working relationships with other health agencies cannot be overemphasized, for the work of such agencies is an important supplement to the operational program. Cooperation maximizes impact and also avoids duplication of services and facilities. Conversely, if relationships are poor or nonexistent the effectiveness of the operational program can be adversely affected, particularly if competitive attitudes are permitted to develop. Agencies most frequently encountered include mission groups, family planning associations, and the Red Cross.

#### WITH HEALTH UNITS WITHIN THE SYSTEM

Effective communication embracing both personnel and materials among all units of the operating program is essential. Equally important is for administrators to give sufficient weight to the question of prestige (image) among health workers (9).

Usually, the urban health worker or the worker in a hospital tends to be accorded higher prestige than the rural worker. The result is that rural workers strive to enhance their prestige by working for promotion out of rural areas and into an urban unit or hospital. Adequate awareness of the problem during training will eliminate some of this, but the most effective time for coping with it is during the operational phase. It is imperative that all health personnel, and particularly supervisors, be continuously sensitive to the problem and take pains to accord prestige and a positive image to rural health workers (10). Probably the most effective job of keeping rural workers content in their assignments has been done in China (11).

A more technical but equally common problem of health unit relationships involves patient referrals. Clinical problems are, of course, referred to those units best qualified to handle them. The actual referral usually works well, but problems can arise when the case is returned to the referring peripheral unit without a diagnosis and recommended course of treatment. The basic cause of these

problems is a breakdown in communication. Efforts to get around communication problems have entailed repeated redesigning of referral forms, but even so the problem continues, even in well-supervised demonstration projects (12).

When the responsibility is given directly to the patient himself or to the patient's family, the system seems to work best, although still imperfectly. When the responsibility remains within a strictly controlled referral system, the forms recommending a given treatment often arrive too late to be useful. It may be that a combination of approaches is the most effective. That is, a patient may be given primary responsibility for delivering the diagnosis and treatment recommendations to the referring unit—and, at the same time, the supervisor of the diagnosing unit assumes responsibility for transmitting more complete information, such as a discharge summary or the outpatient record, to the referring unit.

### **Processes**

In operating any health program there seems to be an inherent tendency to complicate the process. During planning and implementation of new or modified primary health care programs tasks and duties can be clearly and succinctly defined. However, after the passage of time the processes, forms, activities, and lists begin to expand and diversify. This accumulation must be avoided as much as possible. Advisors, supervisors, teachers, and evaluators err on the side of suggesting too many additions and not enough deletions. Simplification and clarification should be the rule and role of all supervisors and advisors. If the process is allowed to become complicated and confusing, the entire program has to be redesigned and extra expense is incurred.

### **Community**

The local community takes on a distinctive role during the operation of a rural primary health care program. Primary health care involves the delivery of traditional promotive/preventive, curative, and educative services to a defined geographic area with a specific

population as its target. This community—the target population and the professional staff—enters into relationships of learning, sharing, teaching, and healing.

Through the eyes of the health professional, the target population is seen as the people to be served, as extra hands to help in meeting the objectives of the unit, and as a consultative group in the identification of health-related community needs. Through the eyes of the villager, the health unit is a focal point where health-related activities are most often located, where help can be received for certain illnesses, and advice is received for the promotion of health and prevention of illness. Health workers are seen as people with specific training that gives them skills and knowledge to share.

Working closely with the community, certain leaders or interested people will emerge as persons highly concerned with participation in health matters. Some of these people will be involved already in delivering health services to their communities as indigenous health practitioners. Others will be those who wish to have further training in health. Some will be interested, concerned people who are able to work for limited periods of time depending on their other commitments.

#### COMMUNITY HEALTH WORKER (CHW)

Recognition by the health profession of the need for local residents of communities to participate in their own health care led to a surge of interest in using villagers to provide primary health care in rural communities. Villagers interested in local health service delivery have existed since the beginning of the socialization of man and with the passage of centuries such persons evolved into today's highly trained health professionals. Within traditional communities, even in modern times, herbalists, spiritual healers, birth attendants, compounders (local druggists), and others provide health services. The acceptance of these traditional health professionals by their communities attests to their good intent and even, perhaps, to their skills. There is an extensive literature concerning the use of community health workers within the primary health care delivery

system (13-31). Most of these articles relate to the use of the CHW in demonstration-type projects; striking exceptions to this practice are those concerning China and more recently Nepal.

#### ROLE

The community health worker is perceived by the modern health system as a focal point for entrance into the community and as a boundary spanner. It must again be stated that experience indicates that intermediate-level medex are essential to successful development of a large-scale delivery system involving CHWs in order to overcome problems of training, supervision, and support that are a continuous challenge. The community health worker helps interpret the social and health-related customs of the villagers to the medex and other health professionals and translates the health professional's advice and behavior to the villagers in terms familiar to them.

Additionally, the CHW performs specific health-related tasks in the village. These tasks should depend on the nature and pattern of disease at the village level as well as the likelihood of improving conditions through specific interventions. The more common tasks involve the treatment and prevention of dehydration secondary to diarrhea; detection, treatment, and prevention of undernutrition in children; hygienic assistance during normal deliveries; family planning motivation; communicable disease detection and referral of serious cases for specific treatment.

#### SELECTION

If the community decides to choose a traditional health practitioner as its CHW, community acceptance is assured, but health professionals prejudiced against such practitioners may resist. Training and relationships must be designed to take into account the traditional practitioner's concept of disease and his self-image. If done sensitively, these traditional practitioners may become most effective CHWs. In some settings, adults who are the children of such practitioners may be ideal as CHWs.

Other prestigious members of the adult community who are self-employed may be willing to contribute time and energy to such activities. Selection of such persons by the community assures added trust in the primary health care program. However, these persons still will have to convince their community of their competence as health workers.

Selection of younger persons—persons who are unmarried or who are recent graduates—results in a heavy turnover of personnel because they move on for further training, marry into a different village, or take on additional responsibilities. Even if the community helps in the choice, it takes a younger person longer to win acceptance as a competent health worker. However, younger persons often assimilate new ideas quickly and relate to the health professional in a studentlike manner. The younger person is commonly selected as a CHW when the health professional has the most influence on selection.

Community selection of CHWs is preferable because these workers are ultimately responsible to their community. However, a major risk is that a powerful leader will influence the selection, and political or family considerations may take precedence over potential competence as a health professional.

#### SUPPORT

The support of CHWs comes primarily from their own communities, and most of this support flows from social and prestige considerations. The good community health workers from a traditional community are self-starters. Often they have broken traditional barriers to participate in these cross-cultural activities.

Financial support of the CHW is a special concern to those responsible for funding nationwide primary health care programs. When a country considers the support of one CHW per village, it is considering the addition of thousands of health workers to the total national system. Countries have handled this support in various ways depending on the time CHWs spend each day fulfilling their tasks and on the type of persons selected.

**FULLTIME VERSUS PARTTIME CHWS**

Unless the worker is required to travel long distances because of scattered housing or has been given monthly house visitation tasks as in malaria control programs, experience may show that a fulltime worker will not be required. However, if the program is designed to include a fulltime CHW, he or she will require financial or "in-kind" support, for an individual rarely can afford or is willing to be a fulltime volunteer. A salary may be given by the central government for fulltime civil service positions. However, if this approach is used for supporting large numbers of CHWs, it can consume a significant part of the national health budget. Therefore, whenever possible, communities should be requested to provide salary and/or support "in-kind" through local cooperatives, religious organizations, or some indigenous fundraising mechanism. Fulltime CHWs may be supported by allowing the worker to collect fees for services offered and sale of drugs, but this usually requires a supplementary payment to ensure that the preventive/promotive tasks are performed (32).

The financial support of parttime workers, especially those required to work only three hours or less a day, will depend primarily on the selection of the worker.

**Multisectoral integrated workers:**

Health tasks may be included in the job description of another form of village worker, such as the agricultural extension worker or the local primary school teacher. Financial support is then shared among the government departments involved. If these workers are being supported locally, this may continue. However, problems arise if workers are overextended. The omission of critical health-related tasks must be prevented.

**Retired persons:**

Some countries will have a significant number of former military or other government employees who return to their villages to retire on pension. Such persons often have the interest and time to work parttime as volunteers. Since they have been away from their village for some time, they bring an expanded awareness and perception of needs which tends to make them agents of social

change in health programs. However, their broader experience can separate them from their fellow villagers and thereby lessen their ability to identify with the village and act as social interpreters and boundary spanners.

**Business persons:**

A local shopkeeper may be willing to stock a number of drugs and dispense them according to simple protocols. As this brings him extra business, he may be willing to provide the service free. This person, however, is often not easy to motivate toward preventive/promotive tasks because time away from the shop means less business and hence less income.

**Recent graduates:**

Young people, recently educated but unemployed, are most readily available to become CHWs. These eager people usually require at least a partial salary. However, they are often short-term workers with high turnover rates for they are looking for fulltime employment and upward mobility. If interested in the health profession, they may become excellent recruits for medex training. Because of the brevity of their service to a community, they are not the best to choose for continued community financial support unless community ties are strong enough to bind them through CHW service and medex training to eventual deployment to a health center in the area. Young women in certain settings often are lost to the community after marriage.

**Indigenous practitioners:**

Described briefly above, indigenous health practitioners form a special pool of potential CHWs. These must be categorized in order to consider them with fairness. It is important enough to repeat here that serious consideration should be given to the children of these practitioners as a pool from which to recruit potential medex as well as CHWs.

The traditional birth attendant (TBA) has a unique contribution to add to the role of the CHW: acceptance by the female population as an authority on women and children. Since many CHW tasks relate to women and children, selection of the traditional birth at-

tendant offers ready entrance into the community. These TBAs usually are mature, married women of recognized stability. They usually see new health tasks as valuable additions to their skills and the community continues to support them in the usual traditional manner. Incentives, gifts, or payment for the completion of training courses and for a good field record can be added to encourage the performance of these village workers. The TBAs are often illiterate so that special training techniques are required, and regular field supervision is necessary to ensure the application of the hygienic methods they have been taught.

The compounder or dispenser, now common to most villages, earns his living by selling drugs and medicines he acquires from a drug wholesaler in the city. Ubiquitous, he may be enlisted for service and someday become the village version of the modern pharmacist. He may continue to buy drugs at wholesale and sell at retail while also receiving a fee for services, but a supplementary salary or incentive will be necessary to encourage him to include preventive/promotive services. The use of this practitioner gives the health department and the community an opportunity to improve and control the harmful use of drugs common in unsupervised settings.

The herbalist/hakim/aryurvedic/homeopathic practitioners may already have been recognized officially by the national health department. Adding basic-level (CHW) allopathic skills to the training of these practitioners rarely changes their practices. Such training does not appear to be a productive undertaking to produce CHW services. However, untrained counterparts of these practitioners often work parttime in villages, and may be candidates for such training. Their support may come from fee-for-service payment often given "in-kind" during the harvest season. This form of recompense plus some incentive payment for training periods may suffice.

The shaman and other types of religious healers are other potential CHWs. Their mode of operation is primarily psychological and spiritual. Their payment is similar to that of other traditional practitioners.

Although these workers may seem to be natural candidates for the CHW, any scheme can be destroyed by unworkable or inappropriate approaches to the situation. Setting up financially competitive systems will not encourage cooperation. Asking a TBA to be active in contraceptive and vasectomy programs when she is paid only at the time of delivery is doomed to failure unless there is offsetting compensation. Similarly, requesting a practitioner to take a three-month course in the capital city at one-fourth her usual income and while separated from her patients will fail. If traditional practitioners are to be utilized, the burden is on the professional with the most education and social understanding to plan and approach the traditional practitioner in working out health programs that will best meet the needs of the community.

Salaries and other incentives for the CHW may best be handled in a flexible or varying pattern even within one nation. The classic example is the barefoot doctor in China. The local commune determines the salary and the time devoted to agriculture versus health activities. Attachments to a viable support structure at the village level is a requirement. If the intrinsic traditional health system is predicted to remain for another twenty to fifty years, it may be utilized as the support structure. If cooperatives appear stable, they could be the supporting framework. If malleable government extension programs exist in communities, they can be utilized to support health activities.

Success of a CHW program will depend on its adaptability to the village, its resources, and its needs. Effective maintenance of the mid-level health structure also is critical. So crucial is continued encouragement and supervision by the medex that without it the CHW cannot function effectively. The CHW is a boundary spanner who relies on his role as a community member and on supervision by the health system through a medex.

### **Evolution of the Operational Program**

A three-tiered primary health care program functioning in a traditional rural community might well produce the following changes.

If the community and the health care system are bridged by effec-

tive community health workers with appropriate skills and supervision by well-trained medex, one may anticipate community acceptance of new health concepts. This will result first in a general increase in health knowledge and health-seeking behavior. More specifically, oral fluids will be given regularly to children with diarrhea, supplementary feeding will begin earlier, people will be immunized, and deliveries will be conducted more hygienically. The CHWs initial functions will have become accepted behavior. If this category of health worker is to be continued and firmly established, he must progressively be taught new technical skills. The transition time will vary in different societies. China seems to be showing that it has reached this phase, and the originally parttime barefoot doctor is evolving into a fulltime worker.

Communities and traditional birth attendants may request training courses. Communities and compounders may begin simple regulatory processes. Sons and daughters of traditional practitioners may begin MEDEX training while modern health practices are incorporated into the daily lives of the people. This will be aided and paced by general education and health education in primary and middle schools until community members know enough about their own health to improve the general health of a rural area. Thus, the ultimate goals of primary care delivery programs are achieved by delivering appropriate health-related services in a manner acceptable to a community and based on equitable distribution of such services among the people.

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CHAPTER 7

# **Practical Evaluation for Primary Health Care Programs**

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## **Background**

Evaluation implies a program of examination followed by a judgment of the relative worth, utility, or importance of a program. It is a comparison of the expected with the actual. This is most often done in relation to the program's own goals, objectives, and subobjectives but may also involve an evaluation of the systems utilized within the program (1).

## **WHY EVALUATE?**

The primary intent of evaluation is to aid in making decisions concerning the future life of a program: whether the program or segments of it should continue and how it might be improved or modified (2).

Since modifications are necessary throughout the life of a program, assessment information is required throughout its operational phase. At predetermined points during a program's life, endpoint or conclusive evaluations are required. These are spaced to

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correspond with major decisionmaking periods such as the end of a country's planning period or the end of an external source's funding period. The concluding evaluation is used for the formulation of the next five-year plan or as a basis for requesting additional external aid.

Since the primary purpose of evaluation is to aid in making judgments regarding the future of a program, it is important to know who will be making the major decisions. At the time of end-point or conclusive evaluations, the decisionmakers often are public sector health officials and economists, politicians, and external funders. The politicians, public sector health officials, and economists are indigenous public officials.

Politicians, as well as the public, generally feel that health programs offer helpful services that governments should provide for the public. Politicians rarely have technical expertise in the health field; they are concerned simply that the people be satisfied with the services provided.

Public sector health officials are often technically trained in public health and in clinical medicine. They are concerned with the distribution of primary health care services and their effects on morbidity and mortality.

The finance ministry is interested in costs. Costs are often categorized as development costs and recurrent costs. Since development funds may come from external sources, the finance ministry will be interested primarily in projected recurrent costs which in the future will become the responsibility of the country. Economists may also be interested in health as an investment in economic development and in whether another activity may be more socially effective and less costly over time.

The objectives of funders and donors fall into two major categories. Some donors see health programs as one approach to enhancing economic development. Other donors see health as inherently good and, therefore, are concerned that funds be used in a humanitarian manner. Both types of donors are concerned that their money be used in a way that will most effectively serve their respective interests.

Some international donors rely on the views of international health experts to determine whether their monies are being appropriately used and whether a program should be continued, expanded, or discontinued. These experts vary considerably according to their own individual biases, areas of experience, and training. They may be identified primarily with national health organizations, field operations, training institutions, or community organizations. Experts may lean toward the concerns of the donor, the developing country, academic institutions, or a private agency. These biases will affect their recommendation.

Knowing who will be responsible for making endpoint decisions helps in the design of an appropriate and helpful evaluative plan (3).

#### KINDS OF HEALTH PROGRAMS

Programs involved in the delivery of primary health care fall into one of two groups:

1. Research and demonstration (R & D) programs, designed to test the validity of certain hypotheses
2. Operational programs, using existing and proven information to provide health services

In a primary health care operational program, the objective is to produce services for as many people as possible, using knowledge that has been proven effective through research and demonstration. Since the objectives of these programs differ, their evaluations also will differ. The guidelines presented in this chapter are concerned with the evaluation of operational primary health care programs.

Recognition that rational and political evaluation will interact during the process of evaluating a countrywide operational program leads to the recommendation that the evaluation arm of the program be separate from the health care delivery organization. This separation will decrease the natural tendency toward contamination of the rational approach and will allow for the respect required for objective evaluation. The evaluation arm can be a separate subsection of the government's health services, a section directly under the director of health services or located outside the

health ministry structure, that is, within the planning ministry. This is not meant to deprecate either form of evaluation (rational or political) but to recognize that both exist and have value.

### Methods

#### CONSTRAINTS

Based on the requirement that the evaluation be designed for practical decisionmaking related to the continuance or modification of an ongoing operational program, one can begin to draw some important boundaries for the design.

Time is a most important constraint. The segment of the program assessed or measured should be an entity that changes within a relatively short time period. The data must be available for the decisionmakers to use when required. The time constraint may be from two to five years. As examples, general mortality data may be of little use because change does not often occur rapidly. In-depth surveys that require years of analysis before the results are available are also of no practical use to an operational program.

Retrievability may also be a constraint. Certain factors may be expected to change during the life of the program and be vitally important to the health of the community, but because of the operational nature of the program, they will be irretrievable. A rural primary health care program with emphasis on the oral-rehydration-solution treatment for diarrhea may expect to reduce the incidence of dehydration in children. However, since this approach to treatment will be implemented at a community level, there will be no way to retrieve the information except by teaching every citizen the signs and symptoms related to dehydration and having them keep records of their findings—an impossible and irrelevant task.

Costs of evaluation should be related to the size of the program and should not overwhelm field operations. A figure of 1% is commonly accepted by American organizations such as the Department of Health, Education and Welfare and the U.S. Agency for International Development. Yet it is not unusual to find a program with a large percentage of its budget allocated to evaluation and research.

Often this occurs because the funder wants data to support the extension of the program into another sociocultural setting. The donor, in fact, may be converting the operational program into a research and demonstration program. Hence evaluation costs increase. Caution is required in these situations because the addition of a highly structured or complicated evaluation plan into a health service program modifies the program design. These modifications have a tendency to be self-perpetuating. Remnants of these modifications are found replicated within ongoing operational programs in other sociocultural settings.

Other constraints vary, depending on the country. The number of competent statisticians may be limited. This technical age has brought dependence on computers and computer technicians; the equipment and technicians may or may not be readily available in different countries. The level of transportation and communication, as it relates to the cost of collecting the desired information, may be restricted. A variety of languages and low literacy levels place additional constraints on survey designs. But as constraints specific to the country are considered, the evaluation design begins to emerge.

#### DEPTH

Knowledge of how deeply an investigation should penetrate is another prerequisite to forming a design. Evaluative research may include experiments, surveys, and/or intensive studies.

#### *Experiments*

Experiments may be designed in several ways. The biomedical scientist is most familiar with the pretest/posttest control group design. This is a planned controlled experiment that requires that the experimenter possess the power to choose the subjects exposed to the program throughout the experimental period. This is almost always impossible in a national health service delivery plan. Even when possible, one expects many objections to the chosen design, sampling techniques, and matching criteria used. In social experiments the results are never as clear and precise as one finds

within the laboratory setting. The pretest/posttest control group design is rarely, if ever, possible, nor is it recommended for an operational health care service program.

Variation-over-time experiments in the social setting exist but nearly all are designed for research and demonstration settings in which new hypotheses are being tested.

It is in the realm of the "preexperiment" that operational programs may find their most useful methodology (4). The one group pretest/posttest design compares information gained within one group over time. These before-and-after studies may be affected by extraneous variables such as history, motivation, testing, instrument decay, and regression. Evaluators using such data must consider the effects of these variables when they begin studying a program.

Static group comparison may also be possible within an operational program. Services may be accepted by one social group but not another; although unplanned, this may occur in a countrywide operational program. The use of this fortuitous (to the evaluator) situation will depend on the awareness of the program administrator and his ability to exploit the situation with a static group comparison. Evaluators using this data must consider the weakness in the design: that of uncontrolled selection.

### *Surveys*

Surveys can be done on the entire population, as in a census, or on a sample, as in a public opinion poll.

Randomized sample surveys have become popular in recent years and important methodological advances in statistics have been made regarding these techniques (5). However, the reliability and validity of such surveys, especially in regard to common knowledge, attitude, and practice (KAP) studies, are often questioned. Experimental designs combined with randomized sample surveys may be especially helpful in demonstration-type projects.

Surveys of an entire population, including census data, provide basic information. However, the time lag in collection and analysis

of the data may be considerable and negate the usefulness of the information.

*Intensive or Observational Investigation*

These in-depth studies are an attempt to describe all that is relevant about a single subject. Such studies are common in a variety of social science disciplines and in operations research (6).

Experiments, surveys, and observational studies can be used in a variety of combinations. However, because of the high degree of control required and the problems of good randomization, controlled experiments have rarely been used effectively in studies on the effects of health programs. The inclusion of such experiments into an operational health program may, in fact, change the program into a research program. Surveys and sampling techniques rely on the ease of communication and transportation of developed countries. Often such techniques are found to be fraught with difficulties in countries where communication and transportation are less developed.

Before-and-after studies of one group are most adaptable to the operational health services evaluation. In-depth field studies and observational investigation may also be appropriate for operational program evaluation.

GOALS VERSUS SYSTEMS MODELS

Concepts of program evaluation may be grouped into two major models. One model would evaluate the program based on its own self-defined goals and objectives. Since goals and objectives can be graded as to their level of objective, that is, ultimate objective, intermediate objectives, and tertiary objectives, one may devise multiple indicators that could be used to assess whether the program has met a particular targeted objective.

The systems model is a second type. This model is based on the evaluation of an organization at its various levels of functioning. It assumes that certain resources must be devoted to non-goal-

oriented functions such as maintenance and recruitment and that systems should be assessed.

With these two models in mind, it is beneficial to use Reynolds' input-output framework to consider specific indicators that might be useful to administrators given the responsibility of designing, managing, and evaluating operational primary health care programs (7). (The logical framework used by USAID is another example of a practical model useful for design and evaluation of operational projects.) Originally designed for a specific health services project, the framework is an excellent tool for considering the evaluation of a primary health care service program and allows for the consideration of systems as well as goals.

Inputs are concerned with the resources used in the system and include individuals (staff and patients), supplies (equipment and drugs), facilities, finances, and techniques. The processes of health programs can be divided into curative, preventive, educational, and managerial segments. These processes use the inputs to produce outputs or services. Primary effects and behavior change are the steps that lead from service outputs to changes in status.

While developing guidelines for practical evaluation of primary health care programs, this framework was used as an outline to categorize a number of indicators that may be appropriate for use in an evaluation design (see appendix A). From this list of indicators, a useful roster of indicators was selected and is discussed in the following pages of this chapter.

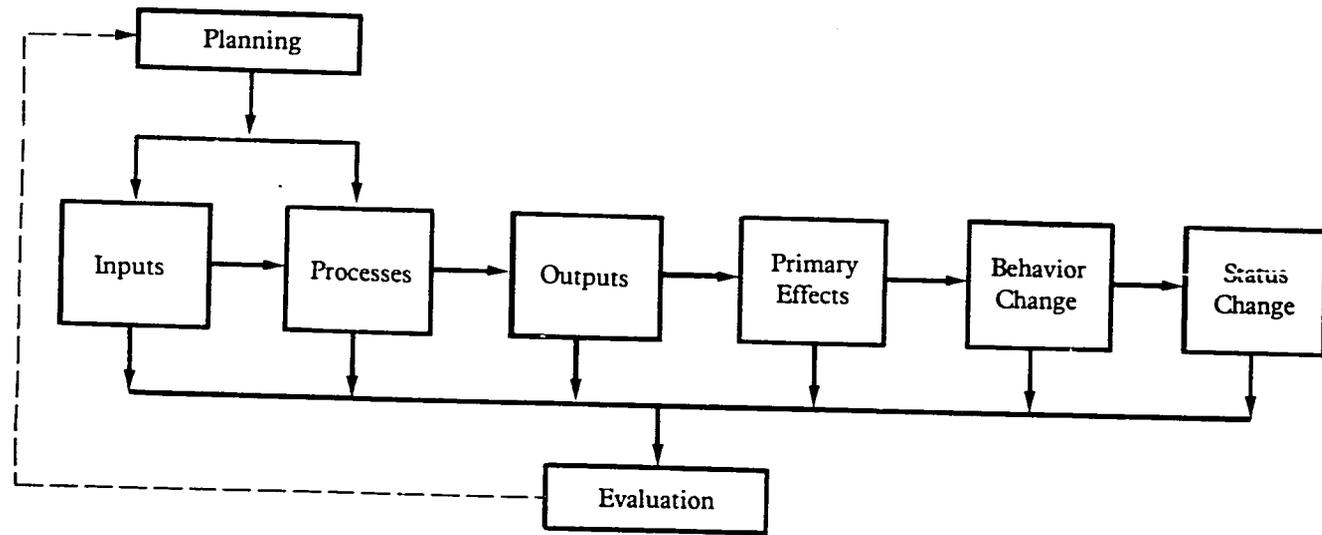
### **Guidelines**

The evaluation guidelines are designed for a program that is:

1. Concerned with the delivery of primary health care services to rural people
2. Operational

The evaluation will be used for decisionmaking by politicians, public health officials, and funders. In such an evaluation, certain indicators can be recommended as being usually retrievable, time-limited, and of low cost to obtain.

Figure 22. Basic model for the evaluation framework.



From Reynolds, J. (7).

### A. Inputs

#### 1. People and facilities

a. Total number of primary care providers and total number of health centers are usually available data that can be compared over time in percentage of increase in three to five years.

b. The distribution of primary care providers and health facilities may be demonstrated by comparing the number of primary care providers per one-hundred thousand rural population, recording change over time as percentage increase.

c. In countries where mapping is complete, census data may be used to compare percentages of inhabitants within ten kilometers of a primary health care center compared over time and recorded as percentage increase.

#### 2. Financial resources

Aggregate expenditures and per capita costs of public sector health care are easily retrievable but are difficult to interpret practically. However, the total expenditure for health, the comparative cost per student graduated from a medical school and from medex training and CHW training, and cost per service per health unit are basic data that should be compared over time. Per capita costs of training should be compared after two years of capitalization.

#### 3. Technological resources

During the process of training medex and CHWs, community needs are redefined and training is designed to fit those needs. Sensitivity to folk diagnosis may lead to new knowledge. This will result in a refocusing of the services provided through the health units. The number of increased or diminished services and their listing allows all decisionmakers to assess the increase in appropriateness of the total services given. This may include the addition of oral solution treatment of diarrhea/dehydration, the provisions of iron and folic acid tablets to all pregnant women, contraceptive services, 24-hour emergency services, or the deletion of chest x-ray screening.

### B. Processes

The improvement of curative, preventive, and educational field performance is implied in the competency-based training provided to the mid-level worker. Field evaluation of actual performance may best be designed within the training component of the program. Community acceptance of the provider will provide a partial practical evaluation of this component.

1. One indicator that will measure management support in a unique fashion is the percentage of health facilities with penicillin in stock 80% of the time (8). This applies to those countries that provide drugs through their health units. Penicillin is selected because it is a drug recognized by community members and professionals alike as being lifesaving for common diseases. The retrieval of this information can be done by processing regular inventory forms, which should be stored at the central supply depot. The risk in selecting such a specific indicator is that personnel may be tempted to hoard or falsify records. The design should include suitable precautions, that is, recording drug turnover rates and spot-checking shelf drug dates.

### C. Outputs

1. A percent increase or decrease in encounters for curative care per year is one measure of community demand for services with the exception of immunization demand in some countries, the treatment of disease is what primarily motivates a person to go to a unit and request services.
2. Other services such as maternal care, communicable disease control, environmental sanitation, health education, nutritional surveillance, and immunization are products of the effort of the staff beyond what is demanded by the community. A total count of those services and a measurement of percentage increase or decrease over time will give some assessment data for staff effort.
3. Based on political or professional requirements, one might

record the quantity of services rendered in specific categories: prenatal visits, deliveries, BCG immunization, and so on. International Woman's Year may increase the political need for evaluating the health program's contacts with women; a national family planning policy may increase the need to demonstrate outputs regarding the distribution of contraceptive services; and so on.

#### D. Status change

Health status effects are measurements of health program goals. Controversy regarding the causal relationship between health services and health status is long-standing, but an operational program is not the sort of program that can prove scientifically whether these inputs have an effect on a community's general health status. An operational program applies a combination of proven technical and management knowledge and processes to a rural population. The purpose is not to prove again that this combination will affect health status; however, decisionmakers will wish to monitor certain indicators of health status throughout the life of the project.

1. Infant mortality rate is a standard rate with international acceptance. Its validity and reliability vary tremendously but most countries have methods to estimate this rate for their populations. It is recommended that the monitoring of the rates be continued throughout the life of the project. A country with a baseline IMR estimate of two hundred fifty per thousand live births can expect a rapid decline within a five-year period of well-distributed primary health care services, while a country with a baseline estimate of thirty-five per thousand live births cannot expect a rapid decrease. However, in every country some assessment of IMR trends will be contributory. Evaluators should be aware that improved records and reporting may produce an initial "increase" in IMR that is based solely on improved data collection.

2. The nutritional status of children may be expected to change over short periods if the baseline is low. Therefore, the measurement of the nutritional status of children compared to

a given standard may be appropriate in many countries. This measurement and its reporting may be designed within the management information systems of the program. As with all measurements, nutritional surveillance recording is not without controversy and common errors.

In addition to the measurable indicators listed above, anecdotal and in-depth descriptive studies will be helpful contributions to evaluation. In-depth descriptions of the activities of new health workers such as the CHW and the medex operating in different field areas will be particularly helpful.

Results of training school outputs, including the number of graduates and their pass marks, are especially important to a MEDEX-type program. Deployment of these graduates and their continuation in their profession are indicators of the appropriateness of the training and of the personnel management capabilities of the system:

- Number of medex graduates per year
- Number of medex deployed and working
- Attrition rate of medex after five years (see appendix B)

The interpretation and use of these indicators and descriptions becomes part of the program evaluation. This can be done by a preselected panel of experts who are given the task of evaluating the program and forming opinions based on the data. Evaluation of data by such a panel is based on the theory that the collective judgment of a group of experts should be more accurate than that of a single expert; it is similar to the Delphi technique developed by the Rand Corporation (9). Consensus is the goal so that the combined opinion can be shared with decisionmakers. It is during this process that matters of validity and reliability can be discussed, argued, and resolved, with the understanding that these are matters that are rarely completely resolved even in strictly controlled laboratory experiments.

The addition of any available data concerning the health status of people and the health system is welcomed. A summary of available

data from any source will be collected for baseline information and for endpoint evaluation. This collection of available data is a Fast, Informal, Relevant, and Economical (FIRE) method of gathering evaluative information upon which to base decisionmaking related to expansion, curtailment, modification, continuation, or termination of a service program. FIRE evaluation is especially useful in program planning and implementation (table 6).

The evaluation plan then includes:

1. The before-and-after use of available data from many sources outside the program design (FIRE evaluation)
2. A roster of selected indicators that are expected to change over time
3. Anecdotal and descriptive materials
4. A panel of experts to digest this evaluative information and provide a before-and-after summary for the decisionmakers

TABLE 6. FIRE Data Sources

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1. National census data
  2. Hospital:
    - a. inpatient data
    - b. outpatient data
  3. Rural health center, dispensary, and health post data
  4. Education department statistics, i.e., attendance records, sick leaves, health education programs
  5. Studies and surveys sponsored by:
    - a. national planning agency
    - b. universities
    - c. anthropologists
    - d. World Bank, WHO, UNICEF, etc.
  6. Voluntary agencies
-

In addition to this approach, designers of an evaluation may wish to include periodic sample surveys. These should be approached with caution because of the cost, time, and personnel required. There may be a need to evaluate the general community's response to a particular segment of the program in order to reorient it during the next operational phase. An example of this might be within a population with a known high-incidence of tuberculosis, where evaluators of a primary health care program wish to determine the percentage of a community reached with BCG. A scar survey for BCG using an adequate sample base may provide the information required to redesign the program within the next planning period. Similar surveys might help in assessing management difficulties during the operational phase of the program. A well-designed project might plan and budget for two to three such surveys, with specified content. This would allow for the flexibility required to apply a major assessment tool to a specific timely need as it arises during the operational phase.

#### BACKGROUND NOISE

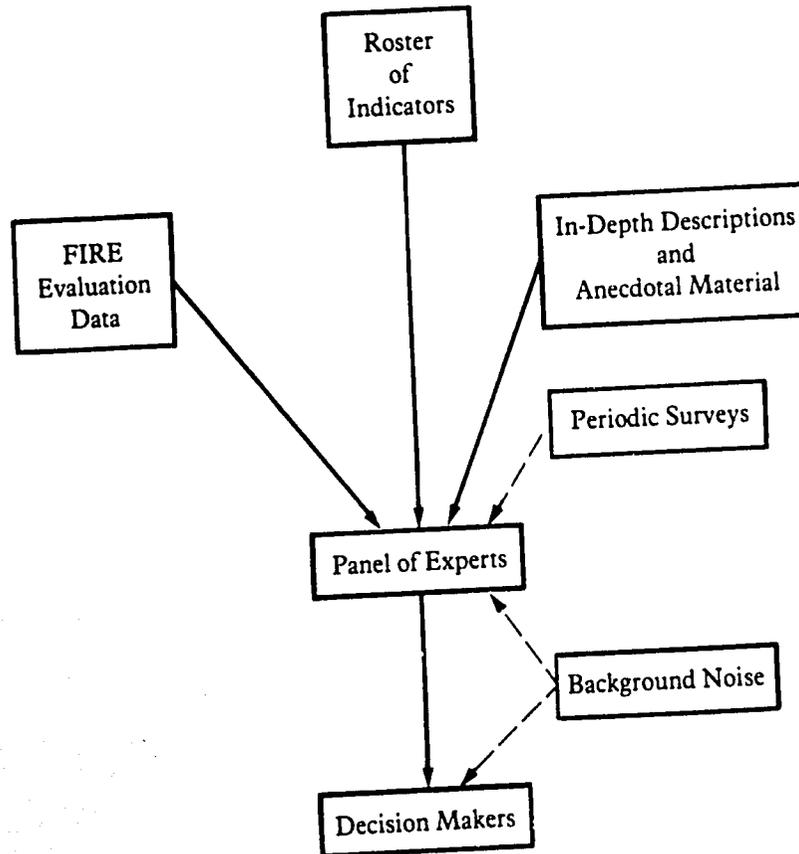
Another criterion rarely expressed but often used by decision-makers is the background communication that comes from all levels of the program, including the external world. If there are relatively few complaints from the field for a long period and suddenly there is a discernible increase in complaints about seemingly unimportant matters, the background noise level is said to be elevated. This "noise" is rarely based on measurable data but is helpful in evaluating the general "health" of a program. Recognition of this subjective measure should be included in an evaluation of a social action program such as an operational primary health care service program.

In sum, the result is the evaluation plan depicted in figure 23.

#### **Discussion**

Guidelines for a basic evaluation of an operational primary health care service program have been described in this chapter.

Figure 23. Evaluation plan.



This has involved an attempt to combine easily available relevant data (FIRE), a roster of indicators that change over time, descriptive material, and well-focused timely surveys, with the reality of the importance of background noise.

Certainly there will be some, if not many, who will want to include experiments with more sophisticated designs. However, the danger is serious that such undertakings may not be the most appropriate evaluation for most operational settings.

Finally, the most important evaluators of primary health care services are the people for whom such services are designed. Utilization rates and background noise should be analyzed as they relate to the response of rural people to the services. Surveys on consumer satisfaction may be appropriate in some settings. How these services are perceived and utilized will be as important to the technical personnel working with the program as it is to policy makers who support it.

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**Appendix A: List of Indicators****I. Inputs****A. People****1. Numbers**

- a. Number of primary health care service providers, i.e., doctors, nurses, medex, community health workers (CHW)
- b. Person-hours of work for primary health care service providers
- c. Primary health care service provider per 100,000 population
- d. Population per primary health care service provider

**2. Distribution**

- a. Percent of the population within 0-5 km, 0-10 km, 0-20 km of primary health care service provider
- b. Percent of the population within 1 hour travel time to a primary health care service provider
- c. Population per primary health care service provider—urban and rural

**B. Physical resources****1. Number**

- a. Number of primary health care centers
- b. Number of primary health care centers with required drugs in stock most of the time, equipment present, and operating most of the time
- c. Number of primary health care centers with staff quarters

**2. Distribution**

- a. Percent of population within 10 km of primary health care center (PHCC)
- b. Percent of population within 10 km of a PHCC with required drugs in stock most of the time
- c. Percent of population within 10 km of a PHCC with standard equipment present and in operating condition most of the time
- d. Percent of population within 10 km of a PHCC with staff, drugs, and equipment

**C. Financial resources****1. Indicators of changes in aggregate expenditures**

- a. Total expenditures in health services
- b. Total capital expenditure/GNP
- c. Total operating expenditure/GNP
- d. Expenditure for outpatient care/GNP
- e. Current operating expenditures
- f. Training school expenditures
  - medical doctors
  - nurses
  - medex
  - CHW

2. Indicators of changes in health unit expenditure
  - a. Hospitals
  - b. Rural health centers
  - c. Rural health subcenters
3. Indicators of change in per capita costs
  - a. Per capita total expenditure on health
  - b. Per capita capital expenditures on health
    - hospitals
    - health centers
  - c. Per capita recurrent expenditures on health
    - training
    - administration
    - personnel costs
    - transportation
    - drugs and supplies
    - preventive care
    - curative care
    - inpatient care
    - outpatient care
  - d. Distributions of above (a-b-c-) by
    - capital city
    - other cities
    - rural
    - rural/urban
4. Indicators of change of per student costs of training schools
  - per MD/MBBS
  - per RN/TN
  - per medex
  - per CHW
- D. Technological resources
  1. Increase in kinds of services provided by a health unit
    - subcenter
    - center
    - hospital
  2. Increase in months of technical training given primary health care service provider: doctor, medex, CHW
- II. Processes
  - A. Curative
    1. Percent improvement in curative care performance of primary care provider, i.e., diarrhea, fever
  - B. Preventive
    1. Percent improvement in preventive care performance of primary care provider:
      - a. Immunization skills
      - b. Nutritional surveillance
      - c. Antenatal care skills
      - d. Delivery attendance skills

- e. Contraceptive distribution skills
  - f. Water source development
  - g. Latrine inspection
- C. Education
1. Percent improvement in performance of health education activities of primary care provider:
    - a. Nutrition
    - b. Maternal care
    - c. Child care
    - d. Child spacing
    - e. Personal hygiene
    - f. Sanitation
    - g. School health education
- D. Management support
1. Percent improvement in performance of management activities:
    - doctors at district level
    - medex at health post level
    - a. Logistics and supply:
      - percent facilities with drugs and equipment x% of the time
    - b. Communications:
      - percent of facilities with no referred community complaints in last year
      - percent facilities having 24-hour emergency communication with higher unit
    - c. Budget:
      - percent facilities operating within their designated budget
    - d. Personnel:
      - percent facilities fully staffed
      - percent facilities staffed with less than two transfer requests in past year
  2. Percent improvement in technological aspects of management activities:
    - a. Percent increase in telephone service at district level; health post level
    - b. Percent increase in regular mail service at district level; health post level
    - c. Percent increase in health posts serviced by all-weather roads
    - d. Percent increase in all-night guard services at health post level; district hospital level
    - e. Percent increase in clerks (secretaries) posted at health center
    - f. Percent increase in health centers with piped water and sanitary latrines
- III. Outputs
- A. General
    1. Percent increase in utilization for all primary health care service
  - B. Curative

1. Total encounters/year for curative care:
    - ethnic groups
    - children 0-1, 1-4, 5-14
    - females 15-44, 45+
    - males 15+
    - low, medium, high income
    - distance from health center
    - education of mother or father in household
    - urban/rural
  2. Disease classification
    - a. Encounters/year per disease classification (ICD)
    - b. Encounters/year per presenting symptom
- C. Preventive
1. Total encounters/year for preventive care
  2. Immunization
    - a. Number of smallpox vaccinations given
    - b. Number of BCG immunizations given
    - c. Number of DPT shots given; number of children receiving two DPTs
    - d. Number of oral polio doses given
    - e. Number of measles doses given
    - f. Number of tetanus toxoid doses given to prenatal women
  3. Nutritional surveillance
    - a. Child weighings per year (health post)
    - b. Armband measurements per year (CHW)
    - c. Height and weight measurements
  4. Maternal care
    - a. Antenatal visits/year
    - b. Deliveries attended/year
    - c. Postpartum visits/year
  5. Contraceptive services
    - a. Motivation contacts per year
    - b. Client visit per year
    - c. Contraceptives distributed to client per year per type
  6. Communicable disease control
    - a. Malaria sprayings per year
    - b. TB contacts per year
    - c. Leprosy contacts per year
    - d. Cholera, yaws, etc., contacts per year
  7. Environmental sanitation
    - a. Water source inspected
    - b. Latrines inspected
    - c. Food stalls inspected
    - d. Food distribution inspected
  8. Distribution of 1-7 above within the population  
urban/rural

- all people
- ethnic groups
- low, medium, and high income
- distance from health center
- D. Health education (nutrition and family planning)
  - 1. Number of educational sessions
    - community meetings                      school programs
    - fairs, melas                                women's clubs
    - radio programs                              farm extension meetings
- IV. Effects
  - A. Health status
    - 1. Mortality
      - a. Infant mortality rate
      - b. Age-specific (1-4 years) mortality rate
      - c. Maternal mortality
      - d. Disease specific
        - cholera, tuberculosis, malaria
        - diarrheal disease
        - pneumonia in children
    - 2. Fertility rates
    - 3. Morbidity rates
      - a. Sputum positive tuberculosis
      - b. Smear positive malaria
      - c. Leprosy
      - d. VDRL
      - e. Gastrointestinal parasites
      - f. Typhoid
      - g. Yaws
      - h. Diarrhea
    - 4. Immunization status
      - a. Scar survey for smallpox
      - b. Scar survey for BCG
    - 5. Nutritional status of children
      - a. Weight/age
      - b. Weight/height
      - c. Arm circumference for age
    - 6. Maternal status
      - a. Percent of pregnant women with hemoglobin over 10 gm
  - B. Socioeconomic effects
    - 1. Number of new people gainfully employed following primary care system expansion

**Appendix B: Roster of Indicators**

	Year (Baseline)	Year 3-5 Endpoint	% Increase/ Decrease
1. Number of primary health care service providers CHW Medex			
2. Number of functioning health centers			
3. Number of primary health care service providers Medex/100,000 rural people CHW/100,000 rural people			
4. a. Number of health centers/100,000 rural people			
..... b. Percent of rural people within 10 km of primary health care center (good mapping and census data)			
5. Total public sector health expenditure (US\$ equivalent) corrected for inflation/deflation trends			
6. Comparative cost per graduated student after two years of capitalization			
..... Medical Doctor			
..... Medex			
..... CHW			

Roster of Indicators (*Continued*)

	Year (Baseline)	Year 3-5 Endpoint	% Increase/ Decrease
7. Cost per patient per health unit			
.....			
Hospital			
.....			
Center			
.....			
Subcenter			
8. Increase in numbers of technical services available (see listing on following page); deletions of technical services			
9. Percent of health units with penicillin in stock 80% of the time			
10. Encounters for curative care per year			
11. Services for noncurative care per year			
12. Infant mortality rate			
13. Percentage of children age 1-4 with nutritional status below 80% of 50th percentile of accepted standard			

Training School Outputs

	Year	1	2	3	4	5
1. Number of graduates						
Medex						
CHW						
2. Number of graduates deployed						
Medex						
CHW						
3. Attrition rate						

Additional services provided

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Services deleted

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Description of medex activities in three field areas.

Description of CHW activities in three field areas.

## **Epilogue**

If you have read the chapters of this book in sequence you will have recognized a trend in the presentation. The theory and basis for health's role in development gave way to a practical approach to designing improved services that can guide the reader as he looks at his own country's specific needs. A structured planning discussion then put the formalized requirements for a planning document into perspective.

The remaining chapters moved from idealistic theory to applied reality. Professionals who have been training new health practitioners and implementing, operating, and evaluating health programs described actual operational experiences which the reader can view in relation to the needs of his own country.

Emphasizing and integrating prevention and health promotion with essential curative medicine, MEDEX as an approach has brought together primary health care program experiences from the global community and focused them on one of the major problems facing the developing world.

*Maika'i no ka mana'o.*

## Glossary

*Primary Health Care.* A multisectoral concept directed toward improving well-being and consisting of "simple and effective measures, in terms of cost, technique and organization, which are easily accessible to the people requiring relief from pain and suffering and which improve the living conditions of individuals, families and communities" (*Promotion of National Health Services Relating to Primary Health Care*, Geneva: World Health Organization, 1976, p. 1).

*Primary Health Care Services.* Services provided at the individual's and community's first point of contact with the health system. These may be basic health services provided by CHWs, or more sophisticated curative, preventive, or promotive services provided by medex or doctors. These services also include health-related vertical program activities such as communicable disease case finding, development of safe water supplies, family planning, malaria control, food preparation and preservation, and others. Secondary-level health care services are those provided by specialists to whom patients are referred. Such services are usually rendered in hospitals. The services provided by specialists in larger medical centers with sophisticated laboratory and rehabilitation capabilities are usually referred to as tertiary-level services.

*Basic Health Services.* Those primary health care services directed toward sustaining life and preventing premature death (e.g., first aid, treat-

ment of fever and dysentery, oral rehydration). These tasks, usually performed by CHWs and medex, also include specified preventive (e.g., BCG and tetanus immunizations) and promotive (e.g., nutrition education) activities.

**MEDEX** (*in all capital letters*). An approach for designing improved and expanded health service coverage. The word is derived from the French and Spanish words for extension of the doctor (une extension du médecin, un extension del medico) and describes a systematic design approach that utilizes new health practitioners to expand medical/health service coverage.

**Medex** (*in lower case letters*). A generic term used to describe the category of intermediate- or mid-level doctor extenders. The terminology varies from country to country. Such workers are called medical assistants, mid-level health workers, physician assistants, nurse practitioners, medex, *wechakorn*, assistant medical officers, and so forth. The word "medex" was created as a nonpejorative term to aid in the creation of a new image for this group of health practitioners, avoiding terms such as "assistant" which connote an inferior position.

**Community Health Worker (CHW)**. The provider of basic health care services in locations most peripheral or isolated from hospitals and rural health centers. The community where they work is usually a rural village but may be an urban or peri-urban neighborhood.

**Rural Health Center**. The health activity locus peripheral to a hospital. It is sometimes called a rural health clinic and may have a few beds. Primary health care services are provided there by doctors, medex, and support personnel. Urban areas often have an analogous facility.

**Rural Health Subcenter**. The health activity locus peripheral to a rural health center. It is often called a health post or dispensary. Health care services are usually provided there by medex and CHWs. This facility may have an urban counterpart also.

**Community Health Unit**. The most peripheral locus of primary health care activity. It is usually at the village level or within a cluster of dwellings. It frequently may be the home of the CHW. CHWs are the only providers operating at this level.

## Acknowledgments

This book demonstrates that vast amounts of knowledge and experience can be reduced and focused into an approach that can guide the development of appropriate life management services in a contemporary setting. More profound and detailed background against which this book is set is found in the references cited at the end of each chapter. However, special mention must be made of specific works and individuals who have greatly influenced our thinking over the past few years.

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### **✕ Production Notes**

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