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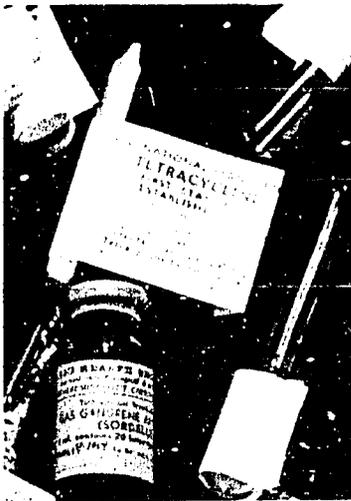
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INTERNATIONAL HEALTH PROGRAMS

TRAINING AND USE OF AUXILIARY HEALTH WORKERS: LESSONS FROM DEVELOPING COUNTRIES

Doris M. Storms



MONOGRAPH SERIES

AMERICAN PUBLIC HEALTH ASSOCIATION INTERNATIONAL HEALTH PROGRAMS

**TRAINING AND USE OF
AUXILIARY HEALTH WORKERS:
LESSONS FROM
DEVELOPING COUNTRIES**

**by
Doris M. Storms**

**AMERICAN PUBLIC HEALTH ASSOCIATION
INTERNATIONAL HEALTH PROGRAMS
MONOGRAPH SERIES
NO. 3**

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PREFACE

This is the third of a series of AID-supported monographs in international health, jointly developed by the American Public Health Association and the Office of Health of the Agency for International Development. In selecting monograph topics, an attempt has been made to identify areas of topical and timely interest in order to reach working level professionals and policy makers in the field. Since the monographs have been planned with a practical rather than theoretical focus, they are targeted for generalists in international health rather than the academic or specialist community. We suspect, however, these communities will also find these monographs of use for other reasons.

The author and referees of this monograph are richly endowed with field experience with auxiliary health workers, and represent a team with first hand experience, and multiple associations with those responsible for actual, ongoing, living, breathing, training and service efforts utilizing primary health workers. The present volume pulls together experience and bibliography in the area of design and management of non-physician health provider programs in developing countries. This is not the first publication to deal with auxiliary programs, and will not be the last, but does, at this point in time, pull together what is known, what works, and distills out principles which may guide those who will initiate programs, and provide food for thought for those responsible for mid-course corrections to existing efforts.

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FOREWORD

As the thrust for achieving more adequate levels of "health for all by the year 2000" gains momentum, increasing attention is focused on finding appropriate solutions to the complex problems of expanding and extending health care.

Given the heavy burden of illness, the scarcity of resources, and the lack of adequate input of previous systems, it is increasingly apparent that new approaches must be found. With the recognition that the conventional patterns of curative, hospital-based, high technology medicine do not offer adequate solutions, a growing emphasis is being placed on promotion of health through more integrated actions of health care, sanitation, education, agriculture, transportation, and a renewed emphasis on participation by individuals and communities stressing the need for utilizing previously untapped resources.

Numerous challenges are posed by this effort, pointing up the many unanswered questions, unsolved problems, inadequate information sources and unexplored issues.

In addressing this, the American Public Health Association has established a Health Information Exchange through which it generates, collects, analyzes, and disseminates information on issues in health care delivery. As a part of this effort, a monograph series will review some of the critical subjects of concern such as comprehensive planning, manpower development, financing, environmental aspects of health programs and mobilization of the private sector. These reviews strive to synthesize available knowledge in a format of interest and use to individuals concerned with the planning and implementation of health care programs.

In recent years, the more developed countries have joined the less developed countries in realizing the impossibility of training and supporting the vast manpower pool (doctors, dentists, nurses, and engineers) that would be needed to extend to the rural areas health services as customarily delivered in urban centers. With the high costs and the problems of distribution (difficulty of influencing highly-trained professionals to work in

rural areas), programs arose for the training and utilization of different categories of health workers who have much less formal education, whose training can be done close to the area of utilization at a low cost, and who are willing to remain in the rural areas. Such health providers have been used in many countries over the years in both small-area programs and in ones of a more extensive nature. Now that the concept has gradually been accepted as reasonable and as a basis for delivery of primary health care, we considered it propitious to produce a volume that would present the experiences of auxiliary-based health care delivery programs, both positive and negative, to provide background for persons already involved in, or contemplating the utilization of, auxiliary health manpower. Ms. Storms has done a very careful analysis of these experiences.

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Doris Storms was born in Illinois in 1934. She has studied sociology-anthropology at Washington University and public health at Yale University. This work draws on her fifteen years experience in training, administration and evaluation of health manpower, chiefly home health aides, community mental health workers, nurse practitioners and physician's assistants. In 1975 Doris Storms undertook doctoral study at The Johns Hopkins University, where she is currently a faculty member in the Department of International Health. She has been associated for the past two years with a continuing education program for primary health care workers in Jamaica.

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Many individuals and organizations stimulated and sustained the writing of this monograph. Sincere thanks are extended to Dr. Herbert Dalmat, who guided, encouraged, cajoled, tolerated and taught me throughout the process, and to Dr. William Reinke and David Werner for their critical reading of the manuscript. Helpful suggestions on the original outline were made by Dr. Joe D. Wray, Dr. Daniel Flahault, Dr. Derrick B. Jelliffe, Dr. Vicente Navarro, Dr. Kenneth R. Farr, Karen E. Lashman, Gerald Ftienne, Dr. Eduardo Baranano, Dr. V. Jagdish, Helen D. Cohn, Nancy Pielemeier, Dr. Tomás Engler, Dr. Leonard Krystynak and Dr. M. Harvey Brenner. I would also like to acknowledge the contributions of my colleagues and teachers, Dr. Dennis Carlson, Dr. Melvyn Thorne and Dr. Tim Baker, who greatly enlarged my understanding of the manpower development area and continue to share their knowledge unstintingly with others through their formal and informal teaching. Most importantly, Dr. Carl Taylor inspired me, as he has countless others, to care for community health. This work was strengthened by the World Federation of Public Health Associations, through their support of my attendance at the meeting in Geneva, Switzerland, of the WHO Expert Committee on Training and Utilization of Auxiliary Personnel for Rural Health Teams in the Developing Countries with Special Emphasis on Management Programs. The Department of International Health, Johns Hopkins University, provided me with materials and extensive library resources necessary to the completion of the work, for which I am grateful. Finally, I would like to thank Valeda Slade for editorial assistance and Martha List for essential aid in the typing and organization of the manuscript. Thank you all.

Doris M. Storms

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SECTION I—INTRODUCTION

Importance of Health Auxiliaries

The use of health workers with only short-term training to provide basic health services is not a new idea, but it is one that recently has gained much prominence. Today, auxiliary health personnel are providing primary care services in the community and assisting in clinics and rural health centers. They are reaching people who have been unable to get modern health care, particularly the poor and those who live in rural areas. These auxiliary workers are known by many different names in different countries. There are also differences in their training, salaries, supervision—indeed, in almost every aspect of their use, yet what they have in common is that they reach the community at a simple, basic level. Because they offer village-based primary care, auxiliaries provide a unique opportunity to introduce new methods and relevance into the delivery of a country's curative and public health services.

Growth in Knowledge of Auxiliaries

Our knowledge about auxiliaries has rapidly increased. There have been a number of publications concerned with their activities. These include commentaries from leaders in national and international health on the rationale for paramedics;¹⁻⁶ descriptions of existing primary care programs;⁷ and most recently, diagnostic manuals or guidelines designed for the health auxiliary.⁸⁻¹⁷ Some of these publications are specific to a certain locale. Such an example is the comprehensive *Community Health Worker: Program Manual*, which was written for a program in California.¹⁸ Other manuals, such as *Primary Child Care*, have been assembled from sources all over the world.¹⁹ Several countries and international organizations have held conferences on primary health care and community action programs that have included important discussions on the use of community workers and similar auxiliary health manpower;²⁰⁻²⁶ and through the informal networks ringing the globe, the experiences of those who have developed auxiliary programs have been shared. These activities have resulted in resolutions from international

agencies for extension of health services coverage based on primary care and community participation strategies.²⁷ A chief recommendation is the expansion of basic services to communities through use of locally selected lay persons and substantial numbers of auxiliary personnel.²⁸⁻²⁹

To date, we do not have detailed scientific data on the most efficient and effective program elements for a particular setting. Nevertheless, the contributions of many people in many countries have provided a basic core of knowledge about the training, use, and services of health auxiliaries. The purpose of this monograph is to draw together this information, to discuss generic issues in the design and management of auxiliary based health services, and to describe alternatives in order to assist countries in developing their own resources for improved delivery of health care.

Purpose of This Monograph

This monograph is written for persons responsible for designing and managing health care programs in the community. The information contained here should be pertinent to those at all levels of health planning and administration, from the senior health planner and regional and district health managers to the implementor at the local level. It should be of chief interest to the medical or health officer who is responsible for the planning and administration of a program in which auxiliaries provide some basic health activities in the community, such as health promotion, preventive care, and simple treatment.

Since funds are so precious, there must be a strategy to develop programs that are both low in cost and effective. The senior health planner has to allocate funds properly for national health manpower (numbers, distribution, and mix by specialty) and related training programs. The planner must designate the appropriate number and specialty type of facilities, including use of health facilities for clinical training. To do this, the planner must intimately know the economics and geography of the local area as well as the characteristics and health problems of the population and understand exactly how health personnel are to be used, trained and supervised at the local level. Similarly, the person managing the program in the community must understand how that enterprise fits into the overall functioning of the health system, as well as how to implement the strategy for dealing with community problems.

This monograph is intended to be a practical, useful source book on ways to plan and carry out the recruitment, selection, supervision, continuing education and evaluation of community health workers to provide a basic level of health care. As Fendall has stated, in designing health services for developing countries, "the overriding question is not *what* but *how*, on the slender resources at command."³⁰

Issues in Health Services Delivery

Before moving into the specifics of program development, it is impor-

tant to discuss some basic relationships between health care and human needs.

Distribution

Equality of distribution is an important element in the newer conception of development and health planning.³¹ In the past, emphasis was placed on complex technology, specialization and such capital-intensive services as curative medicine and hospitalization. The conventional model has been hospital-based, doctor-centered and disease-oriented. But this model has not benefited the great mass of people. Only 10 to 15 percent of village people in most poor countries have access to modern health care. Eighty percent of the people live in rural areas, while 80 percent of the doctors and hospitals are in the city.³² Attention is now shifting to an intermediate level, labor-intensive technology in the hope that it will be more appropriate to the needs and social context in which the process of health care occurs.³³

The desire to extend service coverage into the village at low cost through the use of auxiliaries has been given additional impetus by the rapid rise in fuel costs. Areas that once relied on mobile medical teams now find these completely impractical. Increasing costs of medical care and manpower training further jeopardize adequate coverage of underserved areas.

Because two-thirds of the world's population live in rural areas, this text frequently refers to low-cost health delivery systems for rural areas. Attention, however, is also given to auxiliary programs that provide health care to ever growing urban populations. Migration to the cities continues as people seek social and material advancement. Unfortunately, many are not absorbed quickly into the city's economic life, so they live in situations of poverty, high unemployment, poor housing and inadequate or no sanitation. Both villagers and urban poor are in need of programs that emphasize health maintenance, family planning, and proper nutrition. Whether rural or urban, in the home, factory or field, all people should have equal access to a basic level of preventive and personal health services.

There are an estimated 1.1 billion people with a per capita income of under \$150 a year, and perhaps another billion people whose per capita income reaches only \$200 a year.³⁴ How to assure that this vast majority will have access to a basic level of health services is not only a technological problem, but also a moral problem deeply involving human values.

Unequal division of the world's wealth and resources is a fact that health planners and managers confront daily. Finding the necessary economic resources to meet the health needs of the "world's poorest billion,"³⁵ is a complex task requiring long-range solutions. Given the economic constraints, several other strategies have evolved. Most recently it has been suggested that the potential of local human resources

offers the greatest immediate promise for increasing the amount and type of available health services.

Community Participation

Indeed, the most important health resource in any health service is the people. By that is meant more than just the health worker or the consumer; it means the community itself. Navarro has pointed out that most of the public health campaigns that have been successful have been based on a massive participation of the population in the genesis and implementation of the plans.³⁶ The development of auxiliary programs, as with other health services, is a joint enterprise of planners, managers and the community.

Essentially, governments should act to reduce suffering and to improve the quality of life of their citizens. But how can these aims be translated into action? Communities do need government assistance to obtain trained workers, health facilities and basic medical equipment. Yet centralized government planning for health and development has often failed since the attempts to bring services to the people did not involve the energetic and thoughtful participation of the people. McCord has stated the challenge well: "For the most important health needs [the professionals] will have to think in terms of transferring the technology to the people—that is, they must create in the people an understanding that they have the ability to solve most of their problems themselves, that assistance is available when it is needed and that occasionally public action is necessary."³⁷ Planners and administrators need to learn how to involve the community in the process of planning, selecting, training and supervising community health workers, whether paid auxiliaries or volunteers. The challenge is to increase the people's control over their environment. This will expand their control over their own lives.

Health as Part of Development

Finally, to understand fully the relationship of health and human values, medical professionals must face the reality that other community concerns will probably take precedence to the relatively small problem of providing access to medical care. Providing adequate quality and quantity of water supplies, increasing agricultural production, improving efficiency of animal husbandry, as well as providing education, housing, good roads, communication with other parts of society, and labor rewarded with wages that permit a decent living all may require more immediate attention in the total development picture than access to medical care.

Diversity of Health Service Approaches

Another basic principle in the delivery of health services is that there are many solutions—that is, there is not one model, but several, and the task is to develop the one most appropriate for a particular setting. To-

day, the interface between the health system and the community is being explored in a variety of forms. Several countries have re-examined the respective roles of the community and health services personnel, particularly in light of the experience of the People's Republic of China with barefoot doctors and decentralized participatory self-development.³⁸

Experimentation with different ideas is important because the experience of one society cannot just be extrapolated to another. Practices that are successful in one country surely will need to be modified in another. There are several reasons for this. Technology is not always relevant and beneficial, even if available.³⁹ The appropriateness of family planning methods to different settings is an example. For reasons of acceptability as well as appropriateness, different contraceptive methods are chosen for distribution in various areas. Similarly, because of local conditions, the infrastructure necessary to support auxiliary health workers (supervision, communication, transportation) will not be the same in one area as in another.

The creation of any new element in health services delivery arises out of both an historical and current social context.⁴⁰ Some types of primary health services exist in every country. It is important to assess and build on these. Efforts to extend coverage to all persons will depend, for the most part, on the success which which the new health workers and their institutional arrangements can be jointly incorporated into the modern system of medicine and the traditional life of the community.

Even if the technology can be transferred from one social setting to another, there is the question of the community's acceptance of the innovation. The barriers to accepting change have traditionally been identified as illiteracy, rural values, fatalism, and lack of media exposure. But these individual attributes occur within a social structure. Individuals function in social systems and represent the values of those structures. Rather than criticize the "old ways," it may be more fruitful to see that the introduction of any innovation—whether health auxiliaries or community in health planning—takes place in a specific economic and political situation. Ronaghy and Solter's experience in Iran of following the Chinese model of community selection of village health workers points out the social impediments in trying to translate one cultural model into another cultural setting.⁴¹

Political Desirability

Even the desirability of training auxiliary health workers is as much a political decision as a technical one. Cuba's impressive gains in health coverage and changes in mortality and morbidity patterns have taken place in a model that places priority on primary care to rural areas with services delivered by physicians.⁴² In the People's Republic of China, on the other hand, the response to the mandate to put the emphasis on rural areas in medical and health work was the rapid spread of non-physicians,

“barefoot doctors.”⁴³ The disappearance of the rural medical auxiliary (*medecins africains*) in Francophone Africa resulted from a political decision in favor of qualifying secondary school graduates for physician training and occurred in part because of the progress in education.⁴⁴ Many more examples could be cited as all systems innovate in their own unique way. In summary, health care delivery may appear to be a neutral entity, but it is not. It is as responsive to social and political forces as any other activity of society.

Patterns of Illness

Another element causing diversity of programs is the different patterns of illness in the world. The health problems of the poor nations are similar to those experienced by the industrialized countries at the beginning of the century. Morbidity and mortality are high in infancy and young childhood; life expectancy is not as long as in parts of the developed world. Infectious diseases predominate. Problems of sanitation, nutrition, population growth, and quality and quantity of water strain the resources of the poorer countries, while the industrialized nations struggle with environmental pollution, obesity, and drug and alcohol abuse. Social and environmental conditions make some populations especially vulnerable to parasites, tuberculosis, tetanus, malaria, anemia or goiter. Even weather conditions give rise to different disease patterns. King, however, has argued that “the main determinant of the pattern of medical care in developing countries is poverty rather than a warm climate.”⁴⁵

The epidemiology of disease is by no means completely understood; we do know that many different factors are involved that vary across environments, and these differences are reflected in program emphasis. Although primary care services differ from country to country, everywhere they focus on a basic set of health problems that revolve around life stages and the social environment.⁴⁶ For example, prenatal and post-natal care, child spacing and child nutrition take different forms in various societies but are important components of health programs in most places. There are also common conditions such as respiratory illness, diarrhea, fever, skin disorders, wounds, fractures and burns that afflict both young and old in many areas of the world. Experiences in many countries have demonstrated the effectiveness of community health workers in providing simple health services for such basic problems. The non-physician approach to child care, for example, is relevant to cultures as varied as those of India and Africa.⁴⁷

There have been few comparative analyses of programs that provide primary medical care by non-physicians in various settings and organizations. However, a study of the delivery of services by medical auxiliaries in four programs in rural Guatemala found that the programs provide acceptable and feasible primary care, even though their goals differ. Some serve individuals, others aim at serving the community. Despite

their differing purposes, the programs were shown to be effective in coverage, case loads, costs and quality of care.⁴⁸

Summary of Current Trends

In summary, despite differences in health and patterns of illness, infrastructure, historical tradition and current social, political and economic context, many countries are now considering social equity in distribution of services, community participation in health programming, and experimentation in service delivery. There is a growing recognition of the need for an integrated program strategy with emphasis on central, regional and local planning. More attention is being given to developing competence in planning at the regional and peripheral levels and the ability to initiate programs at the periphery.⁴⁹ These trends form the background that has led to the increasing use of village-based workers who have a very simple but appropriate level of knowledge of health care. While this may be a different constellation of ideas, separately the concepts are not new at all.

Today's Auxiliaries

Forerunners

The history of the use of auxiliary workers is actually quite extensive. Some supplementary health workers have acted as an assistant to the doctor and others as a doctor-substitute, particularly in isolated rural areas. Fendall,⁵⁰ Elliott,⁵¹ and Dorozynski⁵² all give excellent historical summaries of various auxiliary programs. They recount the history of the use of auxiliaries for at least four centuries in societies as diverse as Russia, Jamaica, and Fiji. Fendall also examines the history of auxiliary training in Africa as introduced in colonial times (the French colonies being particularly important in this regard). Between them, Fendall and Elliott cover the development in this century of medical assistants in the Sudan, Uganda, Kenya, Malawi, Nigeria, and Ethiopia. There is also a brief discussion of programs in Vietnam, India, Ceylon and Malaysia.

Historical and Current Programs in North America

In North America, village health aides were introduced in Alaska in 1947 to provide primary medical care in isolated native villages.⁵³ The U.S. military had used first aid attendants in World War I, and later broadened their role to that of medical corpsmen or medics. Today, the U.S. military has a variety of paramedical personnel, including corpspersons, physician associates/assistants, and nurse practitioners. The Navajo-Cornell Field Health Research Project in the late 1950's at Many Farms, Arizona, was one of the first to use paramedics in the civilian sector of the United States.⁵⁴ In the 1960's, several auxiliary programs were started including the Duke University physician assistant program;⁵⁵ the University of Colorado pediatric nurse practitioner program;⁵⁶

the University of Kansas adult nurse practitioner program;⁵⁷ and the MEDEX program.⁵⁸

From the late 1960's through the 1970's, many projects were begun in the United States that used "non-professional" cadres to provide professional health services. Reports have been published on the experiences of family health workers in Boston⁵⁹ and New York City;⁶⁰ tuberculosis control aides in Baltimore;⁶¹ health guides in Buffalo;⁶² community health workers in Harlem⁶³ and North Carolina;⁶⁴ family health workers in Tennessee;⁶⁵ indigenous health aides in California;⁶⁶ health assistants in Texas;⁶⁷ family health counsellors in Denver;⁶⁸ and former military medical corpsmen to provide health services in jails in Cook County, Illinois.⁶⁹ Domiciliary care, particularly for the elderly and handicapped, continues to expand throughout the country, using homemaker-home health aides⁷⁰ while in California they have trained persons from poverty areas to give nursing care to ill people in their homes.⁷¹

Current Programs Throughout the World

An extremely important forerunner of present village health care programs was the Ting Hsien experiment in rural China in the 1930's.⁷² This experiment was designed "to make elementary medical relief and health protection available for the masses." The foundation of this community health system was the village. There, the Village Health Worker was responsible for records of vital statistics, epidemic control, sanitation, medical relief, and referral and health education. The next level was the Sub-District Health Station, where a physician, dresser, or nurse was located; and finally, there was the District Health Center.

The most provocative and comprehensive use of auxiliaries, however, has come in developing countries where auxiliary health workers can be found in population programs and those of integrated community development. Today, we find rural health technicians and health promoters in Guatemala;⁷³⁻⁷⁴ public health medical associates in Algeria;⁷⁵ multi-purpose workers⁷⁶ and part-time social workers in India;⁷⁷ village health worker clinic assistants in Bangladesh;⁷⁸ American Indian and Alaskan community health representatives;⁷⁹ matrones in the Cameroon;⁸⁰ behdars, behvarts, and behdashtyars and other front-line health workers in Iran;⁸¹⁻⁸² medical assistants in Zaire⁸³ and the Central African Republic;⁸⁴ MCH aides⁸⁵ and medical auxiliaries in Tanzania;⁸⁶ community health workers in Kenya;⁸⁷ health extension officers in Papua New Guinea;⁸⁸ health assistants in Ethiopia;⁸⁹ weehakorn in Thailand;⁹⁰ health auxiliary nurses in Venezuela;⁹¹ family health assistants and rural health workers in Nigeria;⁹² health promoters in Nicaragua;⁹³ village health teams in Niger;⁹⁴ nutrition health auxiliaries in Yemen;⁹⁵ and volunteer village health workers in Nepal,⁹⁶ Sri Lanka⁹⁷ and the Philippines.⁹⁸ This is not an exhaustive list. Programs are continually being developed around the globe, still unheralded. As Dr. Cecily Williams has noted, "Some of the most useful people have no rubber stamp."⁹⁹

Definitions and Categories

There are so many names for auxiliary health workers and their activities so differ that the designations are both confusing and filled with debate. However, several definitions of an "auxiliary" worker do exist. Roemer,¹⁰⁰ in his analysis of the role of allied health manpower in developing and socialist countries, distinguishes four basic types of allied health workers: *traditional healers*, *paramedical health workers*, *elementary doctor-substitutes* and *primary health practitioners*. In his scheme, the paramedical health worker is under the strict supervision of doctors, carrying out delegated functions. In this category he places the nurse, but makes an exception for the Latin American auxiliary nurse who in practice serves as an elementary doctor-substitute in many rural areas. The elementary doctor-substitute has a relatively broad role and due to the lack of physicians in rural areas of Latin America usually provides the care for rural populations. The fourth category of health worker includes those better trained primary health practitioners, such as the Russian *feldsher*, the Ethiopian *health officers* and the Malaysian *hospital assistants*.

Auxiliary health workers are commonly characterized by income and education levels and type of practice. In 1972 the World Health Organization defined the "medical assistant" as a "health worker with eight to nine years basic general education followed by two or three years technical training that should enable him to recognize the most common diseases, to care for the simpler ones, to refer more complicated problems and cases to the nearest health center or hospital, to carry out preventive measures and to promote health in his district."¹⁰¹ Most community health workers have less than six years of basic education and usually less than a year of professional training. They may, however, undertake a broad range of activities, including personal and environmental health services and community development tasks.

One such typology is the categorization of paramedical personnel according to achievement of secondary education and technical medical training (e.g., nurses, midwives), sub-professionals who have some secondary education and medical training (e.g., assistant medical officer), and auxiliary personnel who have achieved a middle school education or less and who received short-term training in medical care skills.¹⁰²

In terms of income, the auxiliary dresser, nurse's aide, auxiliary midwife, dispenser or home health aide receives lower wages than the assistant medical officer, health officer, nurse, midwife, health visitor or sanitarian. These, in turn, are less well paid than physicians, dentists and sanitary engineers.¹⁰³

Recently, some have begun to distinguish auxiliary workers paid in full or part for their services from volunteer health workers who receive no compensation for their services. However, a real loss of information occurs if voluntary health workers are excluded from our consideration of

health workers who provide services in the community. Village volunteers have been used effectively in many areas. For example, they have been used in Thailand for malaria case finding and for distribution of contraceptives in the community.¹⁰⁴ Indonesia has also trained volunteers to provide curative services for minor complaints.¹⁰⁵

Location and type of practice are the usual parameters by which health auxiliaries are categorized. For example, Brooke¹⁰⁶ specifies two types of work for the medical assistant type of cadre— either based at a dispensary or health center in the field or in the hospital. Some professionals distinguish community health workers engaged in village development projects from those auxiliaries engaged in providing personal health services. Some separate nursing auxiliaries from those who do not work within the framework of that discipline. Still another typology distinguishes health workers whose activities are restricted to one type of activity, such as dental aides, auxiliary nurse midwives, psychiatric aides, malaria assistants and sanitary inspectors, from those who are multipurpose workers.

There is also increasing attention to the auxiliary role of traditional birth attendants, such as those in the Sudan, Philippines, Malaysia, Costa Rica and Indonesia, who have received some training in modern birth practices and family planning.¹⁰⁷⁻¹¹⁰

Another method of distinguishing among auxiliaries is on the basis of independence of practice. Does the auxiliary function chiefly as an assistant? Is supervision within the group or across professional lines? Elliott¹¹¹ discriminates between the role of the medical auxiliary as a substitute and as an alternative to a physician in certain specific circumstances. She makes the point that medical assistants or auxiliaries are well suited to local educational levels and to the community's immediate needs; that on occasion they are more useful than any doctor, as in simple health education and midwifery; and that they cost considerably less to train.

A further refinement of defining auxiliary function centers about the scale of the health project that employs the health worker. If the project is a small-scale, locally conceived effort that has developed a health worker to meet the needs of the area and relies on local leadership, limited budget and volunteerism, the auxiliary health worker is generally called a village or community health worker.¹¹²

In short, there are many kinds of typologies that can be used to differentiate auxiliaries since their duties, expectations, educational background, length and type of training, independence of performance, remuneration and status can vary. In this monograph, different types of auxiliaries are considered together in the discussion of alternative methods of the planning and management of auxiliary based health programs; however, concentration is focused on the training and utilization of a basic health worker in the community.

Bibliography and Publications Pertaining to Auxiliaries

For persons interested in obtaining additional information about the various kinds of auxiliaries and types of auxiliary programs, several bibliographies are available. The International Development and Research Centre (IDRC) has a series of annotated bibliographies, *Low Cost Rural Health Care and Health Manpower Training*.¹¹³ There are also two annotated bibliographies, *Health Manpower and the Medical Auxiliary*¹¹⁴ and *The Training of Auxiliaries in Health Care*.¹¹⁵ published by the Intermediate Technology Development Group in London. There are several publications that frequently carry stories on programs using auxiliaries to provide primary care and public health services. Of particular interest are *CONTACT*, a publication of the Christian Medical Commission of the World Council of Churches¹¹⁶ in Geneva, Switzerland; *WORLD HEALTH*, published by the World Health Organization;¹¹⁷ "El Informador," a publication in Spanish concerned with the promotion of rural health;¹¹⁸ and *SALUBRITAS*, a newsletter published by the American Public Health Association and the World Federation of Public Health Associations.¹¹⁹

SECTION II—PROGRAM DESIGN: BUILDING THE SUPPORT SYSTEM

Health Planning Framework

Health planning, like other aspects of management, is not an end in itself, but a tool to help meet the health needs of a population. One has to understand how to use these tools in the most effective manner. In the last decade there has been an increased interest in management techniques and comprehensive health planning. Universities offer instruction in these areas in both graduate programs and special certificate courses. Recently, the World Health Organization initiated a program to instruct health personnel in the complexities of health planning and management. For the reader who wishes to learn some of the basic techniques, several texts are available. Two that will be helpful are *Guidelines for the Health Planner* by Gish,¹ and *Health Planning: Qualitative Aspects and Quantitative Techniques*, edited by Reinke.² Those interested in health planning in both industrialized and developing countries may also wish to examine *Health Manpower Planning: A Comparative Study in Four Countries*.³ This publication reviews the history of developmental planning in Latin America and the Caribbean, outlines the steps in manpower planning and concludes with illustrative experiences from four countries, Colombia, Ecuador, Honduras and the United States.

Health planning can be viewed in two perspectives. One is the actual design of a particular program; the second is formal predictive planning, that is, making predictions through the use of basic techniques about changes over time and taking these into account in program design. In either case, health planning does not come naturally. A person needs training in the use of basic planning techniques for the development and implementation of health projects and programs. Information is also needed on the experiences of health planners and managers in different settings since health planning is a process that incorporates both objective quantitative techniques and subjective opinion.

This monograph will not describe health planning techniques in detail, but will point out how they have been used in the design of auxiliary based health programs in developing countries. This section on program design begins with the planning framework and moves on to the actual planning process. The discussion first centers on the important elements of a support system for auxiliaries and then proceeds to program development, briefly covering assessment of health needs, determining resource re-

quirements, setting priorities, program specification and implementation activities. The material draws upon the experience of people in many areas of the globe. In reading through this section, the reader should remember that the development of a program is a process that takes time. Each step in the process will ultimately come to characterize the whole.

Initiating a Program

Whatever the characteristics or motivations of the health planner and administrator, without a support system an auxiliary based health program will fail. The MEDEX approach calls this support the "receptive framework."⁴ The framework does not spring up overnight; it is painstakingly built and rebuilt over a period of time. There is usually a lag of ten years from the planning to the opening of a new hospital. The development of a primary health care program can take almost as long from the initial idea of felt need to the actual training of auxiliaries.

A most interesting case study has been written about the initiation of a rural health technician program in Guatemala.⁵ The document covers nine years and follows the development of the program, including: genesis of the idea to train physician assistants for rural health care; technical development of the idea in management workshops; influencing the medical community and solicitation of funds from donor agencies; development of political awareness and receipt of funding; management workshops for key individuals to present the findings of feasibility studies; rising opposition to the program; the process of developing the loans and then obtaining the funds that permitted the development of a training course for rural health technicians.

With so many elements involved in the development of a support system, the process cannot be hastened lest there be mistakes that will later plague the operation of the program. The process does not end, however, with the construction of an initial support system. The health manager will be continually occupied with strengthening the support to a program.

Individual and Government Commitment

What constitutes a support system for an auxiliary based health care program? First, the government and the population involved must desire to redress the identified health problems, whether these exist in the rural areas or the slum areas of urban ghettos. Next, there needs to be an explicit commitment on the part of a number of people to an auxiliary based program. Individuals who wish to develop village level primary care programs must work with realities. What is the political situation? Will local officials support the proposed program, and, if not, can one work within the structure anyway? If the program brings genuine change it may also bring repercussions. Are the program supporters prepared to uphold the program when opposition occurs? The program administrator must be

someone with faith in the idea and the willingness to carry it out. Paramount in importance are the national commitment and individual motivation to undertake auxiliary based health and development programs.

The training of auxiliaries can occur for a variety of reasons, e.g., to gain prestige, to imitate some other locality, or from a real determination to have trained auxiliaries because of the needs of a country. Experience has shown that the political will to deliver primary medical and preventive services through the use of auxiliaries is an essential part of the support system. At the Ministry of Health level, this commitment should be translated into written policy. A policy statement should detail why training is being undertaken and how training is to be developed. The policy statement should relate training to utilization, since training often occurs out of context with actual service. The questions of "who" and "what" or even "where" do not necessarily have to be addressed at a national level, but the questions of "why" training is needed and "how" training will take place need official sanction.

There should also be a statement defining the relationship of the auxiliary program to other local and national programs. Just as the duties of the community health worker must be seen in the context of those of other members of the health team,⁶ so the development of a training and service program for auxiliaries should occur in the context of other programs in the ministries of health, agriculture, labor, welfare, or education. Important political, administrative and bureaucratic links must be forged at all levels. Local, national and international resources need to be coordinated for the success of a program.

Some projects are started as pilot projects. They aim to stimulate the imagination and test new patterns of service. Demonstration projects are useful to attract capital and to inform health professionals and government personnel about the potentials of such service programs. However, for long-range impact on a country's health problems, there needs to be a national commitment for any such programs, backed by a strong support system and a solid financial base.

Funding Base

Beyond political commitment and coordination of resources, a support consists of adequate funding for personnel and supplies. Auxiliary health personnel cannot function in a vacuum. Joe D. Wray has summarized it well: "No matter how well-intentioned the program, no matter how adequate or inadequate the training, unless auxiliaries are part of a system that is capable of providing them with satisfactory guidance when needed, the necessary supplies and equipment to carry out the tasks assigned them, and a referral system to which they can send problems with which they cannot deal, they are not likely to be able to function effectively."⁷

For a health program to have a solid financial base, an economic analysis must be undertaken before any project is started. Cost estimates

must be available for the initial and recurring expenses of manpower training and deployment (including needs for training, continuing education, supply and transport of supervisory and referral personnel). Other costs that require accurate calculation are: the supply of a simple but appropriate formulary; construction and maintenance of new facilities; renovation of existing health units; and purchase and maintenance of furnishings and equipment. The cost of facilities to serve as training centers must also be included. In addition, statistical reporting forms, referral slips and postage may need to be included in budgeting for a simple information system linking local health workers to health centers or other health units. These data are then compared to information on the ability of a country to sustain a primary care and referral network.

The need for analysis of social and economic conditions and available resources as a precursor of projects related to auxiliary health manpower has been recognized in a number of countries. For example, a report on auxiliary health personnel in Latin America pointed to the need for such analyses and the coordination of health with other human resource development activities carried out within the national health plan.⁷ Countries that have included primary health care components in a national health program usually estimate the cost for each program component separately by regions, showing development (capital) and recurrent expenses on a yearly basis, allowing for inflation. The primary health care program in the Sudan, for example, has based its costing mainly on the implementation schedule for the different primary health care services that are provided chiefly by community health workers, nurses and medical assistants.⁸ Economic analysis is equally necessary for smaller community efforts, as well as large-scale government endorsed primary care programs. Whether health programs are supported by private organizations, foundations, prepaid member support plans, charitable or voluntary organizations or government, resources will be scarce relative to needs.

Long-range Support

Excessive costs can destroy not only the most laudable plans, but they can also erode the ability of villagers to run a health program independently of outside support. As a report on a villager-run health care network in the mountains of western Mexico states, economic self-sufficiency does not come easy. After 14 years of operation, the health program is still not meeting about 50 percent of its ongoing costs. Determined to become financially self-sufficient, the village health team has developed several means of producing subsistence income, including fees for services (paid for either in money or with work), and projects such as hog and chicken farming, vegetable farming and a cooperative corn bank.⁹ More than determination and ingenuity of the health team will be needed if villager-

run programs such as this one are to avoid long-range dependency on outside fundings.

Analysis of the financial growth and evolution of geographically isolated clinics in the northwest United States and Alaska, staffed by physician assistants and nurse practitioners, has raised some question about the viability of economic self-sufficiency of such practices. Although the clinics studied were staffed by physician assistants and nurse practitioners, none of the study sites had attained self-sufficiency after two and one-half years. The authors concluded that many sites in Alaska would probably never become self-sufficient because of high expenses, small service area populations and low utilization. Further, they suggested that there was a minimum population size of 15,000 needed to sustain an independent mid-level practice without external subsidy.¹¹

Start-up costs may be financed by external donor resources, but such sources usually do not take recurring expenses into account. If a training program is to receive financial and technical assistance from a donor country, the recipient country must be in a sufficient state of preparedness to absorb the external assistance. After the education and training element has been introduced, can the people benefit? What will be left after the training program is over? Can a permanent service program be maintained? Training is relatively easy, but deployment into the field is much more difficult.

Financing Mechanisms

What will be the financing mechanism for the service program? Are funds to come from the government or the community or some combination of sources? If the government is to pay, is there a financial commitment on the part of the national health service for such a program? Government health funds may have to be reallocated to pay for the salaries, supplies, transportation and continuing education necessary in a primary care program for the rural areas. Will the government be willing to alter the amount of money that goes into construction and running of hospitals versus primary care? In Lesotho, for example, there are several village health worker programs in existence. To the extent the government decides to invest in a new referral hospital, it will place a severe squeeze on the limited resources for rural primary care.¹²

Some argue that there should always be a charge for services that is met, at least in part, by the individuals using the service. People should share the costs, as well as participate in program planning and selection and supervision of auxiliaries. It is argued that cost sharing will increase the involvement of people. They will then feel they have a critical say in the operation of the system and in the assessment of the health workers' performance. If the community is not able to finance the entire health program, as is likely in most cases, perhaps partial payment can come from the community. Village cooperatives can be formed that bear the

cost of drugs, for instance. Under some types of prepayment programs families can contribute regularly toward the cost of operating the services. If costs are borne in part by the community, this policy should apply in urban as well as rural areas.

The American Public Health Association's monograph *Health Care Financing in Developing Countries* discusses alternative approaches to financing. Health planners and officers who desire information about this subject will find the monograph useful.¹³

Cost of Auxiliary Programs

Although financial resources help determine the numbers and types of human and physical resource supports available, funds can be used to better or worse advantage. Four low cost health delivery system programs in Nigeria,^{14,15} India,^{16,17} and Guatemala¹⁸ have shown that in areas where there are real economic constraints on development of a comprehensive health delivery system, adequate funds are already available for quite satisfactory village health programs. These programs use paraprofessionals who have been trained in maternal and child care, nutrition, and treatment of common medical problems. The programs have shown striking reductions in small populations in the mortality rates for infants and children one to four years old. The cost per capita per year ranges from less than U.S.\$0.50 to \$2.00. McCord reports that Sri Lanka spent \$3.76 per capita per year on all government health services in 1971;¹⁹ in Nepal it was estimated to be a minimum of \$2.00 per year.²⁰ More recent reports of village health worker projects report higher costs. In an unusually detailed monograph on the structure, function and evaluation of the Kavor (Iran) village health care delivery system covering a rural population of 43,000, Ronaghy reported a cost per person of \$3.50 and a cost of \$2.55 per visit (students and low income villagers paid no fees).²¹ In China, financing of health care is local, with the vast majority of communes practicing self-reliance. It is estimated that \$5.00 is the median cost per year (out-of-pocket) of the "voluntary" family membership premium. This amount varies according to the means of the commune, the previous year's costs, and costs for needed supplies.²²

A major problem in planning community based services is that there is a lack of objective scientific data on costs, activities and outcomes of auxiliary based primary health care programs. A review of general writings on village health workers and project reports from over 50 projects in 27 countries has concluded that village health workers are not likely to be less expensive than alternative clinic based care. In a thorough consideration of cost implications and financing mechanisms for village based programs, Berman states that it would "be unrealistic to expect rural villagers to bear the full cost of VHW's {village health workers} and higher-level facilities in the short term." He sees the need for assuring external subsidy for "many years" and suggests the need for experimentation with ways to suit external aid to local conditions.²³

Administrative Support

Regardless of the money available, no health team will function any better than the quality of supervision, communication and logistics provided within the service. Much attention has been paid to the manner in which the majority of China's people receive their health care services through the "barefoot doctors" and related public health workers. Yet the local health unit does not work in isolation, but is linked to other units. Visiting medical teams provide continuing education to the local health station. Local health workers may refer patients to the brigade health station or to the commune clinic. Farther on in the chain of referral are the county hospitals and the provincial and national hospitals.²⁴

There are many reasons why a management and referral system may not be in place. Funds are only one factor. Sometimes there are problems of scheduling. For example, in a Thailand project, because of differences in duration of training, the health post volunteers and communicators were in place long before the middle level health workers. As a result, they were in the field without a supply, supervision and referral system, although these elements had been planned.²⁵

From this example, it can be seen that time as well as money is a resource; that is, time to explore needs, to plan, to develop administrative arrangements, to hire instructors, to prepare the curriculum; and to recruit, select and teach the students both in the classrooms and in the field. Proper scheduling of program development is critical, particularly in systems of care that involve several levels of personnel. The supervision and referral levels of care must be operational before the auxiliary workers are placed at the village level so that supervision and referral will be available from the start of training. The problems that may arise in situations where higher levels are in place first are ones of bureaucratic rigidities and professional territoriality. Unless they receive special management training, the designated backup personnel may be unable to delegate tasks, supervise, or engage in two-way referrals.

Community Support

Individual commitment, political will, a sound funding basis, coordination of resources, and administrative backup are five elements of a support system—the sixth is community involvement. Different societies have different forms of program development and decision-making. Some have strong central government management, others are more decentralized. In Cuba, the process is highly centralized in plan preparation, but highly decentralized in plan implementation.²⁶ Taiwan and Tanzania have developed different models of community participation; they all emphasize community involvement but vary in their balance of central and local decision-making. Kenya draws upon the popular rural self-help program, the Harambee Movement,²⁷ for initiating health programs and other social services. In some countries, such as Iran and the United States, the impetus for creating new service delivery programs has come

largely from the universities. In Papua New Guinea, the government and churches both have training and administrative control of programs.²⁸

Given the desire for community participation in the program, several questions must be decided at the onset of programs. Is it desirable to seek money from outside the community to train and maintain community health workers? How much of the financial resources of a primary care program will come from the community and how much from the central government and from external donors? Will personnel be used from outside the community to staff the health teams? How much community autonomy is desirable from the point of view of the local, regional and district health managers? How much outside assistance in training and delivering village health services is desirable to the community?

Within the framework of each society, communities must have the opportunity to plan -- that is, to make choices about what their most pressing problems are and how to solve them. Even if there is strong central government management, citizens must have the opportunity to discuss the merits of any proposed program and recommend how the program should be implemented, given the local resources and customs of the community.²⁹ Apolitical planning is not possible. It has been shown that political goals and professional ideologies determine to some extent the organization of the health sector.³⁰ If the values of the community are to influence health policies, members of the community must be part of the decision-making.

A Kenyan physician, Miriam Were, has distinguished the crucial differences between community cooperation and community participation. "With the former, you're really saying that you know best what the people need -- In theory everyone wants to support community participation, but when it comes to the point, they only want it as a peripheral component of a health program. They do not see that to have real community participation, you cannot draw up a definitive program in advance."³¹

Strengths of Community Involvement

Why is it important that citizens feel they are sharing in making both major and minor decisions? One reason is that having decisions made by others fosters dependency. The belief that professionals or outsiders know best weakens the capacity of members of a community to solve their own problems or to take pride in self-help endeavors. Their vulnerability increases without a basic underlying conviction in their ability to meet life's problems.

A second reason for promoting community participation in planning and implementation of health activities is the critical role the ordinary person has in health care. Some of the most important health care decisions are made by individuals and families often in the privacy of their homes: to feed their children differently, to be concerned about their source of water, to have fewer children or to space the children they want

to have. Not only do parents promote the health of children through diet, beliefs about cleanliness, and remedies for sickness, but older children pass on to younger children simple preventive and curative activities practiced in certain localities.^{32, 33}

A third reason for involving the community is that health is only one of people's needs. There are needs for employment, education, justice and protection that compete for the interest of the individuals one is trying to reach with health care. If health care fails to enlist the interest, if not the support of the population, then there is little chance that the essential changes in behavior will occur.³⁴

Although a government, a university, or a church can design a health service and can even place it in the community, the people must desire to use it. "Health will not improve unless individuals and communities make rational choices to improve sanitation and nutrition, to prevent those diseases that can be prevented, and to seek early and adequate treatment for conditions that can be effectively treated."³⁵ The saying, "You can lead a horse to water, but you can't make him drink," needs to be imprinted in the consciousness of planners and administrators.

Different Models of Community Involvement

What are some methods for involving the community in all stages of a health program - identifying needs, setting priorities and carrying out the program? A very practical outline of the steps necessary to develop a community health program is set forth by Johnson³⁶ based on more than ten years experience in the "Dana Sehat" program in Central Java, Indonesia, which stresses the importance of approaching the community in the very early stages of program development. In their experience, adequate social preparation of the community is crucial to the success of a program. It is recommended that informal individual and group discussions about community problems and needs be held between health workers and leaders in the community. Then community leaders, assisted by the health workers, introduce these ideas to community members through group meetings and informal contracts.

A different but successful model of imparting a health message was used in the World Health Organization's smallpox eradication program.³⁷ The decision to eradicate smallpox was made by each country on a government level, but the local communities were vital to the implementation of that decision. Of necessity, the program involved the cooperation of tens of thousands of individuals throughout the world. The strategy was to identify each case and vaccinate all contacts. Program officials did not rely on the message about smallpox detection and vaccination coming from the clinics, health posters or health centers - they estimated that only ten percent of the people would be reached through these sources. Instead, they initiated an active outreach program. After early trials, officials found the most successful methods were the market

search and the house-to-house approach. With very few paid staff, but a first-line supervisor who knew the local situation, what job was required, and how to do it, the WHO smallpox eradication teams questioned villagers about possible cases of smallpox. Cooperation of village leaders was sought in helping to change the community's attitude toward informing authorities about persons with symptoms of smallpox. In orthodox Muslim areas, such as northern Nigeria, religious leaders were contacted. In the South Pacific, the village health communities were used. Not content with having gone to each house in every village where there was a suspected case of smallpox, the eradication teams conducted a survey to see how many people did indeed know about the smallpox campaign and then tested, revised and re-evaluated their methods until they were certain that the population was being reached. Program officials also used wall posters, painting the message on the walls in the village. Although most people could not read, curiosity prompted them to find out what the signs were about.³⁶

A project in West Azerbaijan province in northwest Iran involved the village people in problem identification and plans for health care implementation. The Health Services Development Research Project in West Azerbaijan was a joint effort of the Ministry of Health, the University of Teheran and major voluntary and insurance organizations in Iran. It was one of several projects in Iran concerned with the development of improved techniques for the delivery of health care in that country. Although "top-down" planning characterized Iran, this project sought cooperation and trust of the villagers. Two front-line health workers were introduced, a female and a male. These workers performed simple standardized procedures for defined conditions, provided surveillance, gathered information, involved the community in health activities and functioned with the support and under the supervision of the health center team. Together with the existing health center team they formed the new team of primary care personnel. In rural areas, the female health worker was posted in the most suitable and biggest village in the area. She was based in that village's House of Health, but made regular visits to other villages. The male health worker had no one permanent place, but visited villages regularly at least once a month.³⁷

Initially, in implementing this program, obtaining a health house in the villages was a major problem. The villagers' attitude at first was negative; they had no reason or desire to cooperate. The first health house had to be secured from a relative of a person working for the project. The project administrators first tried to inform the community about the health services to be offered, going from door to door to explain the program. They then set about getting the participation of the community in decision-making. Primarily, however, they had to identify the formal and informal community leaders. They asked, "Who are the leaders of the village?" "Who is the midwife?" "Who is the most important woman in the

village?" Next, the project participants met with the formal and other community leaders. A respectful invitation to attend the meeting was extended, rather than a command to come. All but one of 36 leaders came. Tea and cakes were served. They talked together. "What are your problems?" "We think these are some of your health problems." "How should we work in your area?" "What should be the starting point?" The discussion lasted four hours and resulted in the formulation of a health committee.

Community participation did not happen quickly. The meeting just described did not take place until a year after the health team began to operate in the village. The villagers had been used to programs that were just "Hello, goodbye, and go," and it was not until they were satisfied with the initial health services that they had reason to cooperate. The managers of the West Azerbaijan Project took several steps to break down the barriers of disinterest and the distrust of the people. They:

- relied on the person-to-person approach;
- told every household in the community about their services, not just a favored few;
- were respectful to the villagers in the context of the social mores of that villages;
- asked the villagers to identify their problems;
- shared with the villagers the professionals' opinion of village health problems;
- asked the villagers how to proceed in problem-solving;
- made services available to the villagers through the health house on a regular schedule so that villagers could depend on the health worker's accessibility;
- remained in the village over a long period of time, allowing the villagers to develop confidence in the long-term presence of the front-line workers; and
- realized it took time to win trust and persisted in their efforts to involve the community."

Another example of ways to reach the community comes from San Ramón, Costa Rica, where a local hospital has developed a rural health outreach program with participation from the community.¹⁴ The program is called "Hospital Without Walls" and had its roots in activities begun in the period 1955-1969, although it formally started in 1971. The program encompasses home care, health posts, health centers and hospital care. Nursing auxiliaries supervised by graduate nurses work in the field.

Each community has elected health committees with community leaders in charge of health posts in all rural districts. These committees have formed other sub-committees concerned with potable water, environmental improvement, and publication of health related information in order to obtain the participation of the largest number of citizens. The communities select persons for training as "Responsibles of Health."

These persons do case finding to identify people who are undernourished or infested with parasites. They also examine new-borns and children needing vaccinations. They carry out necessary tasks to keep the health posts operational. Home visits and educational meetings are all part of their activities.

There is also a Regional Community Health Association with an elected board of directors who represent citizens of four counties. The association has encouraged construction of buildings and schoolrooms where seminars, meetings and training courses can be held for health personnel and members of the community.

The program attempts to "educate through entertainment." People are chosen from the rural communities and trained to give health messages by song, ventriloquism, speeches, or magic tricks. Health teams act in theatrical performances many times, and conduct educational courses for the community. Public displays of local crafts, weaving, painting and cooking emphasize health messages. There are contests in oratory, poetry and music to stimulate the interest of the community in health care. Young people are also encouraged to participate in the program by the Responsibles of Health and the nursing auxiliaries. The important element is people-to-people contact.

Persons desiring additional examples of health services programs at the village or urban neighborhood level will find over 30 different projects using community workers or auxiliaries briefly described in the UNICEF document, "A Strategy for Basic Health Services."⁴²

Private Sector Support

So far, this discussion has focused on building a long-term support system through government and the community. But the professional private sector also needs to be convinced that village health workers, or auxiliaries, provide a practical way to care for children and adults in areas where resources are lacking. The health administrator must recognize that not everyone will favor the training of auxiliary health workers. There is widespread reluctance among the medical professions in many countries to sanction the training and use of auxiliary health personnel.⁴³ Opposition also exists from nursing professionals in some areas. Program developers should be prepared to deal directly with objections, especially as the issues under contention are legitimate concerns.

What should be the operational link between the private and public health sectors? Answering this question is a challenge for the 1980's. To date there is no published guide, no formulae worked out as to how to link the two. Private fee-for-service medical practice exists in most developing countries, but is chiefly available to only a small portion of the total population.⁴⁴

In general, community based primary health care teams have little, if any, connection to the private medical sector. Although this separation

may have encouraged innovation in developing a more appropriate preventive and primary health care service in rural areas, the current situation is unacceptable in the long run. Finding the most appropriate operational link between the public and private health sectors is critical to the subject of getting private sector support for auxiliary based programs.

Opposition to Use of Health Auxiliaries

The arguments in favor of auxiliaries have generally been based on the physician and economic resources of the country. These resources are evaluated in light of the distribution, age structure and growth rate of the population. There is also a belief that auxiliary training is more adapted to local educational levels and the community's health needs, as expressed in the most prevalent diseases in the locality. Village health auxiliaries are regarded by some as being better suited to provide health education, to record vital statistics, or to implement environmental sanitation programs in the community. They are assumed to know their communities well and to be culturally closer to the people they serve. Auxiliaries are also not likely to migrate to urban areas or to go to more developed countries.

The arguments against the training and utilization of auxiliaries are several. A major question is whether health duties can safely be delegated to them. Some fear more the possible mistakes of an ill-trained and poorly supervised auxiliary than they do the ills that beset those people receiving no services at all. As Wood notes, "The weight of sins of omission is lighter than those of commission and the political repercussions are less direct."⁴⁵ A second question is whether scarce economic resources should be diverted from medical education to auxiliary training. Some fear that the development of village health workers will retard the provision of higher quality physician care. Also of concern is the possibility that auxiliaries will tend to become dissatisfied with their careers, that they really wish to be physicians and will be discontent with a lesser status or will use auxiliary training as a stepping stone to enter political life. For these reasons, some believe the auxiliary will lack commitment to the work, thus causing a high turnover of personnel and necessitating constant training programs. A further worry is that auxiliaries might set up their own practices—that short-term practical health training is an invitation to medical quackery.

There is also a more abstract reason for opposition to the training and use of auxiliary health personnel—tradition, or what Cecily Williams has called an "appalling, obsessive longing for what one is used to."⁴⁶ Wood, noting that we are creatures of habit, continued, "This inertia is bolstered by the reluctance of all to acknowledge any irrelevancy in their own training and [they] may fear being left behind or left out of new developments or of losing the privileges currently associated with their profession."⁴⁷

A political threat may be posed by health programs that emphasize non-traditional solutions such as training and utilization of auxiliary and

primary health care workers and their supervisors and that redirect health service priorities to include community mobilization and improvement of those economic and social conditions that preclude good health for the people. The radical changes called for to make health manpower development efforts relevant to the health needs and demands of the population will be reflected in people's attitudes. The outcomes of such changes are uncertain, and for that reason critics fear the potential disruption that can come from even a small innovation. This awareness of the implications of change is referred to in the Arab proverb: "If the camel ever gets his nose in the tent, his body will soon follow."

These are powerful forces against change and cannot be taken lightly. Just as there are environmental impact studies, thought should be given to the sociopolitical impact that the development of an auxiliary program will have on the public and private sectors. Only by confronting the discomforts and dislocations caused by change can the costs and benefits be weighed and choices made. Efforts must be taken to minimize loss by bringing into the program the ideas and competencies of those who would otherwise suffer because of the change.

To summarize, for auxiliaries to function effectively, there must be a support system. That support must include government, community, and private sector commitment and resources. The system must provide supplies, equipment, facilities, supervision and referral sources for the auxiliary. Obstacles will be encountered, but if there is the political will, individual commitment, coordination of resources, administrative discipline and community and private sector support, the program can prosper.

Spirit of the Health Team

This formula needs one additional ingredient. As in other parts of life, it is the spirit with which a project is carried out that helps determine a large part of its success. Elliott has written, "Medical auxiliary training schemes should be planned ecologically with a liberal imagination, frequent revision, [and] local and sympathetic evaluation."⁴⁸ To expand on those criteria, the planner, administrator and health team must be sensitive to the dislocations the new program will cause, earnestly desire the input of every person no matter of what status, willingly allow the program to be criticized, learn from mistakes, and persist in the face of obstacles. **Finally**, to provide practical and realistic support the health administrator needs to understand the limitations of an auxiliary program in a particular environment. There are limits to what is feasible or practical in any setting. To understand the limitations does not mean to stop action; rather it is the basis for devising effective strategies for the achievement of goals.

SECTION III—PROGRAM DESIGN: THE HEALTH PROGRAM

Developing a Health Program

Planning Group

Health programs are not planned by a single individual; even government supported programs are planned by a group that must represent the private sector and the traditional or informal health system, as well as existing government health services. The planning group should be both multidisciplinary and multisectorial.¹ It should include persons knowledgeable about prevailing policies and legislation in health, education, employment, labor and technology, and familiar with the officials empowered to make decisions in those areas. It may include persons from universities or other educational institutions. It should also include health workers and other professionals who are aware of the health and social services available in the community or program area (e.g., medical officers, nurses, agronomists, home economists, teachers, matrons). Community leaders (e.g., headmen or religious leaders) and other appointed or elected community representatives should be an integral part of the planning body. Such a diverse group presents a challenge in achieving agreement on program objectives and thus will require wise leadership, but if the strengths of such a group can be marshalled, there will exist a greater potential for the program to achieve intersectorial cooperation and community participation.

A leader of the group should be designated and the planning body should be aided by staff. In its work the group should draw upon the special talents and knowledge of each of its members. Delegation of tasks should not simply follow the usual administrative procedure, but should be based on the skills of the individual members. Thus, at different times different people will be responsible for accomplishing certain tasks. In this text, these persons are referred to simply as "the health planners."

The group begins by planning the planning process. First, a schedule of activities is developed. Each step in the planning process should be identified, and an estimate made of the time required to complete each event. The planning activities are then arranged in sequence according to the order in which the events must occur. With this information, the health planner can estimate the minimum time it will take to complete all necessary events before the work of the planning committee is finished. Committee assignments should then be made on the basis of this schedule.

Population Data

The first step in the process of health planning usually is to obtain information on the current and projected population in the service area. Information on the size, characteristics and distribution of the population is fundamental to ascertaining the amount, type and distribution of disease in a population or community. However, current information is only part of the data needed; the planner must also predict future population developments and the possible consequences for health services delivery. Changes in the size, composition, characteristics such as land ownership and family income, and distribution of a population will alter the requirements for health manpower and facilities.

Basically, the health planner must obtain information on the current number and characteristics of people in the service area and projected changes in the future. At a minimum, the planner needs a count of the population by age, sex and location. This demographic information can be obtained from several sources: census, sample survey, or registration system. While the quality and completeness of population data are poor in most agricultural nations, there has been some improvement. Still, the problems the planner may encounter are numerous. The data may lack sufficient detail, be out of date, incomplete, or exist only for the capital city. Vital statistics data, for example, may be available but unreliable. Nevertheless, even crude estimates are better than no information at all and, indeed, may be adequate for determining the kind of program needed to deal with disease in the populace. It is more important for the planner to understand the relevance of population data to forecasting the magnitude of effort required than it is to have a detailed population analysis.

Population size is a function of three variables: births, deaths and migration. In order to make future projections, the health planner has to calculate rates of births, deaths and in- and out-migrations. There is a straightforward method of doing this: the changes between two time periods are calculated by adding births and in-migration to the initial population and subtracting deaths and out-migration. Usually migration is the least well known variable; however, it can be extremely important when trying to plan health services. For example, estimates of migration from rural to urban areas will affect estimates of needs for health services in the respective areas.

One measure of interest is the natural increase in the population—the excess (or deficit) of births over deaths. In most cases it will be sufficient for the planner to subtract the crude death rate from the crude birth rate to obtain a crude rate of natural increase. The baseline census data may also have to be corrected in order to account for possible under- or over-enumeration. The total fertility rate is another measure that is useful in estimating long-term trends. Texts are available to show the health administrator or planner how to calculate the future size of a population.

given either the population growth rate or a life table to estimate the future population according to prevailing age-specific death rates.²

Assessment of Health Needs

Existing Sources of Data

Another major activity in the health planning process is the assessment of health needs. This information will be used during the planning process to determine the nature and scope of the health program and will serve as baseline data from which to evaluate later the effectiveness of that program in achieving changes in health status.

There are a variety of sources of information on health problems, probably the major one being the vital statistics register. From this source the planner can obtain *information on mortality*. If at all possible, the planner should obtain mortality data by age and diagnosis. Mortality data and population information will provide the planner with mortality rates—the numerator being the number of deaths in the area, and the denominator the total population of the area for the same time period. In addition to the overall mortality rate, the health planner will be interested in the infant mortality rate, the death rate for children under age five, and the maternal mortality rate. The completeness and accuracy of recording deaths varies greatly from one country to another and from urban to rural areas within a country. Information on cause of death is frequently missing or not specific. Data on death by sex are usually available, but often not by place of residence.

Morbidity data should also be obtained by age and diagnosis, if possible. Information about illness is available from a number of sources, such as the medical records of health centers, hospitals, private physicians, and medical examiners. There are also reporting systems for certain serious infectious diseases, but for a variety of reasons most infectious diseases are underreported. Some areas have established disease registers, but again the reporting may not be complete. The planner can sometimes obtain information on disability, or the number of days lost from work; however, the latter is a highly subjective categorization and may have to be inferred from available data. In truly rural areas where auxiliaries are considered as outreach workers, very little data are available.

Despite the many deficiencies, morbidity data can be quite useful to the planner. For example, in determining the nature of health worker activities, it is important to establish the kinds of illness that are currently being seen at health centers in the communities in which the auxiliaries will work. Typically, the 20 most common complaints will account for the vast majority of all clinic visits. Most of the functions required to treat these complaints can be readily standardized and then taught to the auxiliaries. In this way, training can be made appropriate to the actual

job. However, since rural people rarely go to clinical facilities, a true picture of the health problems and needs of the rural population will not be given by health center morbidity data.

A third type of data to be acquired is the *utilization of health services*. If possible, the planner should look at clinic and hospital utilization rates by age, sex, diagnosis and socioeconomic characteristics. The utilization rates can then be compared across all groups, and for different methods of payment, to see if utilization is compatible with the identified health needs of the population. The planner should understand the extent of current health services use by the population.

Special Surveys

The planner may feel that in addition to these secondary sources of data there is a need to acquire additional data through special surveys of either the population or providers of services. The risk posed by incomplete information may be greater than the planner wishes to take. Or the planner may feel it is necessary to have information on population health status or general health practices that can only be obtained from a community survey. Since surveys are expensive, time-consuming and require considerable manpower to collect and analyze the data, the information from a survey must be shown to be cost-effective. That is, the planner must be able to cite the potential value of various alternative approaches to obtaining necessary data relative to the cost of obtaining these data.

Although some planning groups survey providers of services, the more common approach is a field survey to assess and establish the health needs of the community. Such a survey has several components: a census, a health and morbidity assessment and a socio-anthropological analysis. This is sometimes called a *community diagnosis*. To carry out a field survey, it is necessary to interview both users and non-users of health services. Data to be collected may include: physical examination data, such as weights and heights of children; health problems of children; the incidence and nature of illnesses that have prevented members of the household from working; and the numbers of those in the community who are disabled or mentally ill. Interviewers should also obtain current and retrospective demographic data for each member of the household to supplement registration data on births, deaths and migration. From this information planners can build a picture of the age pyramid in the community.

It is not necessary, however, to have a member of the health establishment collect all of this information. In Indonesia, mothers' clubs have carried out effective surveillance programs on child growth.¹ And David Morley has even suggested that 5th and 6th grade children be employed to collect information in the villages on children's weights or immunization status, which could then be given to the local council.¹

It is important also for the health planner to *understand features of village life related to health activities*. Foege,⁷ in an address on community medicine, made several points that have application not only to what data need to be gathered but what community health workers need to be taught. He said that to treat a community you start with a history of a community. The history must include such anthropological data as: *What does it mean to be sick? What is done to avoid sickness? What is done to heal sickness? Where do people go when they are sick? Who gives them advice? What is the significance of different foods, eating rituals? What are the beliefs about birth, death and marriage?* In other words, one must learn the traditions and customs of the people in order to understand their health attitudes and practices.

Next, Foege suggests examining the community for *precursors of disease*, such as amount of food and water available, quality of water, waste disposal, lack of land, poor housing, poverty, unemployment and unsafe roads. This information helps to identify the needs and expectations of the community.

Analysis of Health Resources

In order to determine the nature of the training and service program required, the resources of the current health system also must be determined. This is called a service or resource analysis. The planning body must first assess the physical circumstances under which an auxiliary based health program would be operated. Are the conditions favorable for establishing a strong infrastructure? Difficult terrain, a widely dispersed population or the absence of suitable storage places for foods or medicines will call for innovative strategies in strengthening the administrative support system.⁸

Frequently, there is no organized system for health services. Rather, there exists a variety of programs that developed in an unorganized fashion and later coalesce. These programs may have disparate services, differing administrative frameworks, and unequal mixes of manpower. It is necessary to survey the existing network of medical services within the currently available programs, describe their utilization and make some estimate of their efficiency. How many staff members of what type are located in each of the health facilities? What are their duties? What is the patient load per staff member each day? How many households use the health facilities? From how far away do people come? What is the use in proportion to the total population of the community? Are there any outreach services? What is the cost of providing services?

Job Analysis

A job analysis is an indispensable tool for health planners and managers in determining the nature of health worker activities. In this regard, the planner should focus on those categories of health personnel that are most necessary for the type of program that is under study, and the ac-

tivity being studied must be clearly delineated. One can observe tasks as discrete as suturing a wound. Other activities, such as examining the well child, involve several tasks. For this reason, functional analysis is simpler than task analysis since there are many more tasks than functions. One listing of functions might be maternal and child health, curative and preventive measures, family planning, communicable disease control and environmental health, but there are many other ways in which functions could be listed.

A book that may be helpful to the planner or administrator who is planning to carry out such an analysis is *The Functional Analysis of Health Needs and Services*.⁷ This approach to functional analysis consists of an assessment of needs established by household survey and an assessment of resources established through a survey of the health system. The method has been used in different settings. For example, the Nepal Health Manpower Development Research Project was initiated to collect information useful to health planning and the development and modification of training programs. The functional analysis methodology was used to identify the health problems and needs of Nepal as felt by health personnel in rural districts and to identify the actual roles and functions performed by health auxiliaries and personnel.⁸

One method of job analysis is to *observe practitioners* while they are working. Observation, however, involves time, money and personnel and may be quite expensive to carry out over an extended period. One must also be careful to sample at different seasons of the year: since not all diseases are prevalent during the same seasons, different tasks will be performed. Furthermore, observation must occur in the clinic, at the health post, and in the field, in short, wherever health services are being provided.

Another technique of job or performance analysis is to obtain information through *use of a questionnaire or interview*. There are recall problems with this method. One can ask the practitioners to keep a log or diary, but this may only add to their existing paper work, so that they may not record all information. A checklist is sometimes used, but this creates problems because words do not always have the same meaning to everyone. For example, "counsel about family eating patterns—(always, sometimes, never)" may be interpreted in various ways by different people.

If one is collecting information on actual performance of health practitioners, then it is also extremely important to probe for reasons why there is a discrepancy between the actual and the ideal performance. Perhaps supplies are not available or a person has never been trained to perform a certain duty or the supervisor will not delegate a particular function. There are myriad reasons why a particular job description is not met, and it is necessary to know these constraints when evaluating performance or designing a new job description for a new category of worker.

A less structured method for determining the nature of an auxiliary program is to bring together a group of health professionals to discuss the types of problems they see in health centers and define the responsibilities they feel appropriate for auxiliaries. This *technical conference* has the advantage of obtaining consensus as to what should be taught and how the worker should function, but it is subject to small group processes. The resulting job description could be more a function of the people who were at the meeting than what the system rationally needs.

Priority Setting

Since it is impossible to tackle all problems simultaneously, priorities must be set. Which task should be tackled first, which second? McCord⁹ has given us guidelines for setting program priorities: "The key to successful intervention is the identification of specific conditions that are serious enough and prevalent enough to constitute a major component of total mortality and that are also susceptible to prevention or cure by simple and effective measures." For example, this approach has been employed when frequent causes of death in children under age five are diarrheal disease, malnutrition and pneumonia. Several programs have proved effective using village health workers in intervention services. One, in India, uses paraprofessionals to treat childhood diarrhea and pneumonia at home.¹⁰ Investigators report deaths from those conditions were reduced by 50 percent. In another program, community health aides in Jamaica have been successful in preventing deaths from malnutrition by encouraging prolongation of breast-feeding, identifying children with poor growth status and encouraging nutritional rehabilitation after illness.¹¹

The planning body should set both long- and short-range program priorities. One must assess what is currently being done for identified problems, what is not being done, and what might be done. Curative treatment needs may be obvious, but the preventive services needed must be inferred from the type of problems that are cared for in the home or by traditional practitioners, from the kinds of disease seen in the clinic, and from the causes of death in the community. In this regard, information on precursors of disease is extremely important.

Next, constraints on activities must be reviewed so that the program that is finally specified will be feasible within the human and financial limitations of the community and will also be acceptable to the people.

There are several *methods for health priority assessment*, but very little work has been published on the relative merits of the differing mechanisms. One study in Appalachia compared four ways of assessing the priority of health needs: nominal group process; community diagnosis; random consumer survey; and comprehensive health planning ratings. Data from the four methods were compiled and, while there was a close match of priority listings regardless of method used, differences were

found between the emphasis of health professionals and that of consumers or community members.¹²

Community Involvement

As stated earlier, the community may be involved in the planning process at any or all stages. Too often, however, the people have been passive recipients of fully developed programs. At worst, they may have no input in the planning process; at best, they may have been brought in to review plans made by the health professionals, in order to determine the program's acceptability. However, the importance of involving the community at all stages is increasingly being recognized. In some areas, goals are set nationally, and the available resources are stated. Then, the health workers in the field and community groups are asked how these goals can be reached. In other places, community groups are now being involved in helping to identify problems and in working with technical personnel to set priorities and schedule implementation of programs.

One case study planning model is set forth in a report on the Hazarajat Project in Afghanistan.¹³ It summarizes six years experience providing total health care to a population of two million in an inaccessible, economically poor and medically underserved area. The report describes the baseline studies carried out in each village and the identification and training of volunteer Village Health Advisors to work in the family life program. The report sets forth recommendations for a health care delivery system based on an analysis of data gathered in the various clinic activities, special population surveys, and in discussions held with persons in the Ministry of Health and at the provincial and village levels. Village leaders were consulted about the planned health services. If they rejected the plans, the project team developed alternatives. Priority decisions were made on the basis of information about the age and sex distribution of patients, most common disorders, nutritional status of two- to five-year olds, child survival and population growth. This project is an example of central planning that gives consideration to the needs and concerns of the persons to be benefited by the program. The priorities were set by professionals but required the cooperation of villagers if health work was to be done in a village.

The manner in which the West Azerbaijan Project in Iran obtained participation of a village in setting priorities illustrates another approach to working with the community.^{14,15} The health professionals first asked village representatives to identify their problems. These were defined as lack of cooperation from the village people in development programs, inadequate water, poor roads, lack of schools. Then the technical people shared their opinions on what the health problems of the village were. Next, the project managers made a grid of programs to deal with these problems and asked both the villagers and the technical health professionals to rate the proposed programs as "harmful, neutral, or good" to achieve. The grid resembled this:

VILLAGE OPINION OF THE PROGRAM

	Harmful	Neutral	Good
TECHNICAL OPINION	Harmful		
	Neutral		2
	Good	3	1

The starting point for programs was the category that was considered good to achieve by both the villagers and technicians. Next in priority was a project that was deemed good by the villagers but was seen as neutral in terms of its health effects by the health professionals. Third in priority would be a project considered good for health by the professionals but only neutral by the villagers. In this way the villagers and health professionals proceeded to set priorities for health programs. Of course, this is but one of many possible ways of working with the community; each community will be unique and have differing prevailing social norms.

Program Specifications

Services

Having set priorities, the planning body can now sketch out a program of action to deal with the problems. The planning body may wish to develop a program based on certain standards of care; for example, a pregnant woman should receive at least x-number of prenatal visits or a newborn child should be seen at least x-number of times during the first year of life. These *standards of care* will reflect a balance between needs and resources.

The planning body should also specify the *degree of coverage* of the population. Are all people at risk to be seen or are only people at "high risk" to be eligible for care? The planners may wish to specify the geographical coverage of the services. How far away can people be located from the health center and still be considered within the service area?

The planning team should describe in writing for each member of the health team the individual responsibilities that are needed to meet program goals. This is very important. One of the mistakes of the past has been that programs have defined the role of the auxiliary but have not redefined the roles of all other members of the health team. However, the auxiliary is only one member of a team. Ideally, a team is comprised of staff with each type and grade of skill in correct proportions. Unfortunately, in most places the composition of the team is incomplete. There may be

almost no staff; there may be no delegation of functions; there may be unsupervised workers; or there may be no auxiliaries or paramedical staff at all. It is what King¹⁶ called the "disorders of the pyramid." It is vital that *a job description for all members of the health team* be developed in the context of the resources of the health service system and the objectives of the service program.

Supervisory and Referral Patterns

The program specification should designate the relationship of health auxiliaries to other health workers in terms of supervision and referral. This becomes more difficult the more the auxiliary is expected to work in the community. Traditional supervisory and referral patterns exist for the performance of personal, curative health services. However, relationships between members of the health team are less clear for preventive and health promotion tasks that an auxiliary may carry out.

At least as much attention, if not more, should be devoted to the role of the auxiliary on a development team. Projects such as the ones in Luristan, Iran,¹⁷ and in Jamshed, India,¹⁸ are making us more aware of the possible roles of a basic health worker in a comprehensive rural development program. There the duties that health auxiliaries are expected to undertake include community development, education, agricultural development, stimulation of home industry, etc. In such situations the definition of working relationships, supervision and referral patterns between the auxiliary and the appropriate extension agent must be articulated and agreed upon by all the representatives of the involved sectors of development.

The importance of adequate planning for supervisory and referral personnel can not be underestimated. A number of pilot projects were developed in the decade of the 70's to test the feasibility of providing low cost integrated health services in developing countries. These experimental programs use multipurpose workers who are carrying out some combination of preventive, curative and community development activities. Strong evidence is lacking on the relative cost-effectiveness and technological capabilities of these projects, though circumstantial evidence indicates some programs have been more effective than others. Problems have been encountered in management, distribution systems, supervision, referral and evaluation.

Efficacy of the primary care program will depend upon the planning and implementation of the technical components required to carry out the objectives of the program. Unfortunately, the technical requirements for program success are not present in most countries. The complexities and uncertainties of offering integrated primary health care programs have prompted at least one review group to recommend careful evaluation of the multipurpose approach and continuance of categorical pro-

grams during this period of experimentation.¹⁹ Because technical requirements are not known, it is important for governments to try out different supervisory and referral patterns before embarking on large scale national efforts. This is particularly critical if a substantial number of new health workers with short-term training are to be added to the health system that is lacking in effective management, adequate numbers of supervisory personnel or facilities for patient referral.

Full- versus Part-time Work

One consideration in planning the organization of services is whether the auxiliary is to be a full- or part-time worker. In many countries the auxiliary who works in a health center or hospital is a full-time worker, while the community health worker is part-time. There are several reasons why it may be more advantageous to employ part-time community workers. By employing a large number part-time, the program can employ a greater number of workers at the same financial cost. These workers can then spread out over the villages distant from dispensaries or health centers. Apart from achieving greater coverage at the same cost, there are more intangible reasons for using part-time workers. It is generally believed that part-time workers will not identify with the health system, but will retain their ties to the service community. Due to the limited scope of their job, they will not lean toward professionalism, but will retain their comprehension of and identification with village life. It is also believed that the community will not view this person as an outsider; thus, in situations where there is some suspicion of organized government services the part-time worker will have much better rapport with the villagers.

There are some disadvantages to employing part-time workers, however. A large number of part-time workers makes administration difficult, resulting in weak and ambiguous control by the central system. Technical supervision may be so inadequate that there is little or no consultation and continuing education for the auxiliary. Relationships with other health and development personnel also may be more complicated as organizational relationships are not as clear. In addition, some authorities have questioned the suppositions about the advantages of non-professionalism. In their opinions, the community might view the part-time auxiliary as providing second-class medical services and thus avoid that person and use the health center. Obviously, how an auxiliary will be viewed by the community depends a good deal on the social and cultural situation in the particular area.

Another problem with using part-time workers is that the expectations of the planning group may be unrealistic in terms of the amount of work the auxiliary can perform. Doing auxiliary-oriented functions take a long

time — much longer than clinic activities. Few people have the background to estimate accurately the length of time necessary to travel between households and to work in the community. In the Kasa Project, India, an evaluation established that the part-time social workers felt strongly that their job was a full-time one, given the amount of work they had to do, and that they deserved much more in wages.²⁰ Such feelings can lead to general dissatisfaction and even job turnover.

Compensation

Volunteers versus Paid Workers

The planning body must also address the question of whether or not the health auxiliary is to be compensated for providing services. Many countries use volunteers to provide preventive and curative services in underserved areas. The workers are unpaid largely because the government health services do not have funds to pay salaries for the number of workers needed in underserved areas. However, there are opposing points of view about the issue of compensation, as there are with almost every aspect of the role of auxiliaries in primary care.

Some say that the *volunteer* is preferable to the government-paid auxiliary because the community thus becomes responsible for its own health. They believe this increases the self-reliance of the village. Other people disagree, maintaining that it is unethical to ask the poorest segments of society to support their own health services when the richer elements receive services from others.

Another perceived advantage of volunteers is that villagers will regard the auxiliary as one of their own, not as part of the official health system. Others counter by saying that the villagers will feel the auxiliaries are less competent if they are not paid for the work. They also believe that volunteers cannot coexist with paid health workers because the volunteers will feel inferior to the other health professionals; and the health professionals, in turn, will think less of the volunteers because their work does not involve compensation.

Serious questions have also been raised about the dependability of volunteers. Since the per capita income is so low in many developing parts of the world, unpaid service may work a real hardship on volunteers. Some of the consequences of this have been detailed by Joseph, including decreased motivation to work and increased temptation for corruption and abuse of the system.²¹ There is reason to believe that turnover is high among volunteers. In some projects, volunteers have left villages to look for paid jobs elsewhere. This problem is more acute among young people who have little commitment to village life. Their work can also be episodic: for example, volunteers have dropped health activities during peak farming season when wages rise and resumed health activities during slow periods.

Forms of Compensation

Usually, however, some form of compensation is given auxiliary workers. The rewards depend upon the culture. In Tanzania, for example, the village medical helpers are not salaried, but their work is regarded as communal work, and for that reason they are exempted from other communal tasks in the village.²² Health workers might incur increased prestige or respect due to their service. Sometimes, the health worker receives gifts in kind or services from the community. Some authorities have argued that the form of the reward is not so important as where the reward comes from. They recommend that if pay be forthcoming, part at least come from the community the auxiliary will be serving.

The community may either give the worker full or part salary or subsistence support. The problem, of course, is that the communities usually find it difficult to obtain adequate funds for the worker. Some projects, such as the proposed Barrio Aid Personnel Service in the Philippines, rely on prepaid health insurance, which involves a monthly contribution from community members to support the work of the auxiliaries. The insurance fund is managed by a village committee, which compensates the worker.²³ However, despite the acceptability of health workers and the value of their services, a health insurance scheme is not always successful. The trial project for village health workers in a remote area of Himachal Pradesh, India, is an example of this. In spite of the success of the program itself, the villagers' contribution to support the workers has not been adequate or consistent, and even the village leaders do not think monthly family contributions a good idea.²⁴ Another method by which the community can support a health worker is to develop income-generating projects such as sale of garden produce, handicrafts, or health education pamphlets to outside groups.

In some areas, the government cooperates with the villages in supporting a health worker. In the Sudan, for example, the government provides a subsidy in grain. The money generated by the community through grinding and selling grain is used to pay the community health worker. Sometimes costs are shared. The health worker's salary may come from the community, but the government provides training, supervision, supplies and transport.

Sometimes the government or the community authorizes the health worker to charge for services. In some places workers may keep all or part of the entire fee; in others, they can retain only the portion that covers incurred expenses. Where communities are small and many people are relatives or friends, the health workers may, in fact, end up charging little or nothing for their services. The worker may also receive profits from the sale of drugs. Unfortunately, this method of payment focuses the worker's attention on curative work and mediates against preventive services. It also encourages health workers to prescribe drugs more often than necessary.

Civil Service Status

The auxiliary may also be salaried or receive subsistence earnings directly from the health system. Auxiliary workers may be employed under special projects through the hospital, or they may have full civil service status. If the new category of worker is to be a part of the government health services, attention must be given to making the auxiliary's position within the civil service hierarchy compatible with other similar positions. Often there is a disparity between new and established positions or between positions essentially urban and rural in location. For example, in Zambia, medical assistants have been trained by the government for nearly forty years.²⁵ There was a time when this was one of the highest status jobs available to a Zambian in his own country. Now, although the medical assistant carries the burden of outpatient care, he is decreed an auxiliary and starts on a much lower scale in the civil service hierarchy than does the registered nurse who is not considered an auxiliary. Similarly, one can find, in some countries, that physician's assistants who head the health teams in the rural areas are being paid less than the team members they are supposed to supervise.²⁶ Salary amounts need to be in line with both the skill level and actual workload of the health auxiliary relative to other government workers.

Disparities in status, esteem and salary must be worked out in advance of programs because they cause much discontent and rivalry between members of the team who should be working in harmony and may lead to resignations. As Flahault has pointed out, the fullest attention should be given to the career of the medical assistant by the authorities. "This is essential if the profession is to have the place and the monetary rewards it deserves."²⁷

Job Incentives

In this regard, it is important that even before the program begins, responsible authorities develop incentives for auxiliaries to remain on the job and increase in competence. There are a number of incentive schemes that have been tried: promotion, increase in salary or employee benefits; special educational opportunities; certificates, pins or flags of recognition; professional meetings and field trips; preference for receiving new equipment; and use in advisory, supervisory and teaching capacities. Whatever scheme is employed, the health administrator needs a way to formally recognize hard work and adequate and efficient performance. There should be opportunity for the auxiliary to be rewarded without having to seek another job or move elsewhere.

Although at times criticized as a Western cultural bias, many people have stressed the importance of providing the auxiliary with a means for career advancement. One method is to open other career possibilities. In the People's Republic of China, for example, it is possible for selected barefoot doctors to enter medical school.²⁸ Other programs give the

auxiliary the opportunity to specialize in a particular medical area or move on to administrative positions at the local, district or national level.

Possibilities for promotion within the general category of primary health care worker are also important. Some programs create career ladders consisting of junior and senior level positions, with the senior posts carrying more leadership responsibility. Sometimes different posts are created for auxiliaries employed in different types of health services. Unfortunately, the more junior positions are often for workers in preventive services, while the more senior posts go to health center auxiliaries or workers engaged in more clinical practices.

One disadvantage of creating multilevel positions is that the roles of the various workers may be made rigid and not allow for the creative experimentation necessary to adapt to the particular service experience in different localities. It has also been found that the distance between levels is very important. If the wage and benefit structure for the different levels is far apart, there may be a strong push to move out of the lower paying positions; however, if the levels are close together, there may be less motivation to seek a higher level.

Special attention must be given by planners to workers in community health and development programs as there is usually a lack of opportunity for advancement within programs at the community level. As previously indicated, community auxiliaries can frequently obtain better paying jobs within the government health services or private industries. Some workers have even found it more profitable to set up independent practice, despite the limitations of their training. It is a great waste to lose the knowledge and skills that these workers have gained in their years of experience at the interface between the community and the health system. Attrition can be reduced by planning ways to reward the performance of village workers and to offer opportunities for career advancement. It is possible to advance village workers by making them supervisors or tutors, as for example in the Philippines, where community health workers can become teachers of others.

Criteria for Promotion

If the planning body decides to create several levels of auxiliary workers, it must also specify the criteria for promotion. Is promotion to be based on seniority or merit or both? If based on merit, who decides? The criteria for promotion may include passing a test or recommendation of the auxiliary's supervisors based on on-the-job observation or recommendation of a community health committee. The criteria might include those who show particular kinds of initiative; for example, those workers who show initiative in obtaining additional training in related areas such as agronomy or family life education.

The question of when promotion can take place must also be answered. Will there be scheduled evaluation periods or eligibility for promotion after a specified number of months experience on the job?

The challenge to the planner comes in trying to mesh the requirements of the formal health system with the reward structure of the community. This problem is even more difficult when the community health worker is not part of the civil service organization. Both the technical experts and the village committee or council must work together to develop a means to recognize good performance jointly, encourage career longevity and create possibilities for advancement within the community care structure.

Contracted Services

An important issue to be decided in advance of starting a program is whether the auxiliary is to be under an obligatory contract or commitment. There is always attrition in a program—it occurs during the selection process, in training, and on the job. If the auxiliary worker is an obligatory contract employee, then the loss of man months on the job is less than if the worker can resign at any time. On the other hand, there is some reason to believe that attrition is much greater during the early years of the project and becomes less as time goes on when both the auxiliary and the administrator know what to expect of each other. Thus, the need to reduce turnover through contract employment probably declines over time. If the program developers choose to put auxiliary workers under contract, then they must pay special attention to job satisfaction and morale of the worker who has no alternative but to stay on the job.

Resource Requirements

Manpower Projections

When the scope and limitations of the various categories of workers on the health team have been defined, careful attention should be given to manpower projections. The health planner needs information on the supply of workers currently in each category and on those who could be retrained for new roles. Since few countries have established registries, it is often difficult to get these data. At best, the planner will be able to obtain estimates of available workers by age, sex, nature and location of practice.

The information on manpower supply is then projected ahead for each category of worker for one, two, five or ten years, taking into account losses by retirement, migration and death, and gains from anticipated graduates of health professional education programs. Projections for each member of the health team will be unique. For example, migration out of the country can be expected to be minimal for auxiliaries, but may be considerable for professional supervisory personnel.

Information on health team manpower is then aggregated and compared to *estimate on demands for services*, projected into the future one, two, five or ten years. Estimating demand requires the health planner to think in terms of changes in population size, composition, density, and location. If additional services are to be made available, that in itself may stimulate a greater demand for services in the population. Also, the planner must take into account anticipated changes in the ability of the population to pay for services, either through changes in family income or in the methods of financing health care. If the manpower supply is not expected to be adequate to meet the demand, then either the number or the productivity of the workers must be increased to meet the demand.

If the scale of the operation is to change greatly, the planner will have the problem of how to preserve quality of services as the program expands. The planning body must be certain that bigger will be better and understand at what price that growth will be achieved.

One approach in planning is to set manpower targets in terms of *population ratios*. For example, the figure commonly cited for programs using auxiliaries is one basic health worker to 1,000 population. However, this ratio can be misleading, since it depends upon local conditions, availability of other staff and the nature of the basic health worker's job. For example, an auxiliary can provide care to a large population if the people live close together, but not if they are widely dispersed. Thus, the planner may wish to develop manpower projections based on coverage of the population. One might specify that an auxiliary health post be within five kilometers of eighty percent of the homes. In a dispersed area, this would require many more auxiliaries to meet the standards.

A health planner must also take into account the *ratio of auxiliaries to supervisory personnel*. This ratio will differ according to whether the auxiliaries are functioning as assistants to or substitutes for the physician and according to their location. When auxiliaries are widely dispersed, a supervisor cannot provide adequate backup services to a large number of workers. Several projects have set a ratio of one supervisor to five to ten auxiliary workers when the worker is functioning as a physician's substitute in a rural area. In urban health facilities, however, the doctor may not be able to supervise more than three to five physician's assistants without spending an inordinate amount of time on supervision.

Building from Smallest Unit

A recommended approach to planning an auxiliary based health program is to begin at the smallest administrative unit (e.g., village), identify the problems of the area, the tasks that need to be performed, the health workers who can accomplish each task, the funds needed for services and the means to raise the funds. The planner aggregates local needs for manpower and facilities and estimates the cost, then proceeds to the next political division and carries out the same procedure. This method requires the collection, manipulation, and synthesization of a great deal

of information. Data from a number of localities must be ordered and reduced to the essential components of personnel, facilities, supplies and equipment for the entire service area.

Micro-level planning has the advantage of being more meaningful at a community level and is more conducive to securing community cooperation and involvement in planning. It is also more flexible and permits greater initiative and innovation at the periphery. However, the cost can be excessive if plans are developed according to the most ideal service solution for each locality. The health planner can end with a plan that is beautifully designed but bears no relationship to the available resources of the national health system.

The health planner should consider the use of local resources in the construction of any new facilities that may be needed. One form of community support is the construction of the posts, health huts or health houses, where some or all of the auxiliaries, activities take place. These posts should be built on neutral and easily accessible territory. Some health professionals suggest the posts be built in the local style with local materials.⁷

Job Title

Another important aspect to which the planning body should give careful attention is choosing the job title for the auxiliary worker. Since auxiliary tasks and training differ from place to place, each area is free to invent its own job title. The entire planning group, including health professionals and members of the community, should be involved in designating the name.

There are a few guidelines for selecting a name. The name or title should be simple and easily understood by the community and should be consistent with the functioning of the auxiliary. It should also have meaning in the national health system. It should pose no threat to other members of the health team and should be satisfying to the worker, not being perceived as demeaning or pejorative, but rather adding a sense of dignity and pride to the auxiliary.

Legal Sanction

Finally, as part of the planning, it must be determined that any new categories of health workers to be trained have legal sanction. Technical issues of certification and licensure must be worked out in the context of each country's laws. The planning body should seek legal advice during this planning process. Legislation may be required before a project or program can be implemented.

Implementation Schedule

Having specified a program, the planning body then moves on to schedule implementation activities. Plans should specify each activity

and event that must occur before the actual service program begins. Since several activities can take place at once, program development must be carefully monitored by the health manager so that auxiliaries are placed in the field with adequate supplies, supervision and referral system.

The strategy for implementation of the program must be appropriate to the community as well as the health system and must designate the order of activities. For example, a program can be designed that will eventually provide the community with a pure water supply; a waste elimination system; cleanliness of village and markets; elimination of parasites, rats, fleas and lice; the development of school gardens; and the establishment of primary care health posts that offer preventive and curative care. Obviously, the community health worker cannot undertake all these activities at once, although if the organization is functioning several aspects can start simultaneously. Realistic objectives must be set for each of the various phases of the program, and the timing of these events must be scheduled. How best to proceed with such a multifaceted program should be worked out during the planning process.

The planning group needs to balance optimism and enthusiasm for the proposed program with the recognition that it is often a painstaking process to develop the necessary conditions for the primary care worker to take root. "It is better to have implementation proceed slowly according to schedule than either to rush activities to meet an unrealistic time deadline or appear to fall hopelessly behind schedule.

In summary, adequate planning of a program requires each of the following steps: problem identification; resource development strategy; priority setting; program specification; and implementation strategy. The basic outline for evaluating the auxiliary's job and the program's services should also be specified in advance of the program. Comprehensive evaluation procedures are discussed in Section VI.

SECTION IV – RECRUITMENT, SELECTION AND TRAINING OF AUXILIARY HEALTH WORKERS

Planning the Educational Program

Preparation for training auxiliaries includes the same considerations as those in planning health services programs using these workers. One needs to know the resources of time, money and trained personnel that are available. Keeping the program objectives in mind, decisions have to be made concerning where training will take place, whether training will consist of one short course or a structured ongoing process, and how many and what types of teaching personnel will be required. Costs can be estimated on the basis of such factors as length of training, salaries and living stipends for students, size of classes, teacher salaries, materials, transportation and facilities.

Locale

In general, auxiliary education consists of classroom instruction, clinical training and community practice. There may be a variety of learning sites, including schools, regional training centers, mobile vans, hospitals, health centers or posts and community settings. However, the appropriateness of the training site must be carefully determined. If students are transported to a training center far from where they will work, local health officers will be unable to monitor the training and progress of the students. There may also be morale problems. In addition, separation can more easily occur between training and the actual work context of the auxiliaries. If possible, training should be decentralized, with tutors rotated to different training centers, so that training may be given as close as possible to the place where the auxiliary was selected and will work.

There is no simple answer as to the balance and sequence of classroom and workplace training. Training should be consistent with both program objectives and economic realities. The most successful training programs for auxiliaries place relatively less emphasis on formal classroom study and a great deal of emphasis on learning by doing, on the job, under supervision.

Workplace experience gives more meaning to formal instruction and reinforces classroom learning. It may also disclose problems not well covered in the curriculum. However, not all field experience is equally meaningful. Unless training takes place at a site where the programs the auxiliaries are expected to carry out are, in fact, being carried out

effectively, students cannot be provided the right kind of on-the-job experience.¹

Decisions must be made about the interdigitation of classroom and in-service training. Training is an ongoing process and does not end with the initial formal training course. In planning the basic curriculum, one needs to anticipate the long term in-service training needs.

Instructors

The selection and training of the teaching team is of paramount importance to the success of the program. Teachers may be physicians, nurses, paramedics, social workers, agronomists, public health inspectors, school teachers, and other health and social welfare workers. Experienced auxiliaries themselves can be a valuable teaching resource. Some programs use interdisciplinary teaching teams; others use the medical assistants in government service as tutors. The structure of the teaching staff is of less importance than the ability of the staff to impart the necessary skills and knowledge appropriate to the tasks that will be required of the auxiliary. The instructors should have experience in the task the auxiliaries will be expected to carry out and should have worked under conditions similar to those that the auxiliaries will experience. Unless the teaching is based on realistic knowledge of the situation, the instructors will be less effective in preparing the students for their future responsibilities.

Teacher Training

Most countries have limited teaching resources. Additional teachers of health professionals can be trained through workshops in which health and welfare workers can learn to develop educational objectives, plan curricula, construct tests and acquire appropriate teaching and evaluation techniques. These educational workshops need not be limited to health personnel. When resources are scarce, there is a need to coordinate and pull together the resources of various governmental sectors, instead of each sector training teachers in isolation. It is necessary to develop a practical process for informing health program field personnel about the various technologies, their potential uses, their limitations and means of adapting them to field conditions.²

Some countries faced with a shortage of teachers have employed a group of teachers to work as a mobile training team. The group is usually based in the ministry of health. In Central Java, a self-multiplying system of developing teaching resources has been developed. The first generation of health auxiliaries are trained by a staff of professionals. After the auxiliaries have had six months of experience and additional training as teachers, they instruct a second group of health workers. The second group teaches the third, the third teaches the fourth, and so on.

Technical Assistance and Training Aids

Until only very recently there has been almost no technical backup for those who train auxiliaries. Maurice King has pointed out that the result

is that those who organize and teach courses to auxiliaries have often to do so without help and usually without adequate texts and materials. He sees a need for the preparation of texts and teaching materials, a provision for external examiners, training and refresher courses for teachers of auxiliaries, and organized conferences for instructors. In addition, professional journals or materials that could be used by auxiliaries should be published, as well as a journal concerned with auxiliary training. In medical and nursing education, technical reinforcement has been the weakest in the area of auxiliary training.⁴

This situation, however, is beginning to change. Several texts are available that will be useful in planning educational workshops. The World Health Organization has published two: *An Educational Handbook for Health Personnel*,⁵ and *Teaching for Effective Learning: A Short Guide for Teachers of Health Auxiliaries*.⁶ The WHO Technical Report, *Training and Utilization of Auxiliary Personnel for Rural Health Teams in Developing Countries*,⁷ includes a selected bibliography, and a listing of films that may be of assistance in training teachers.

In the United States, the Center for Educational Development in Health (CEDH) at Boston University assists in training health professional teachers in competency based curriculum design, teaching methodology, evaluation, and preparation of instructional materials. The Center has published a text, *Systematic Course Design for the Health Fields*,⁸ which evolved from course materials used while the Center was at the Harvard School of Public Health. The CEDH competency based approach to curriculum design derives instructional objectives, content and evaluation from the on-job responsibilities of the health worker being trained. The text prepared by CEDH was field-tested in Cameroon, Colombia, Honduras, Lebanon, Malaysia, Nepal and Vietnam to determine whether the systematic course design method was applicable in the developing world. In an analysis of the field test results, Vanderschmidt and associates conclude that a range of health professionals in the developing world were able to adapt this sophisticated educational method of curriculum development for their own educational purposes. Still to be answered are the costs and long term effects of competency based training on worker performance.⁹

Considerable progress has also taken place in the development of course materials. In the U.S., *Project Concern* has produced a manual for village health promoters and an instructor's guide to accompany it. These have been field-tested in Bolivia.¹⁰ MEDEX, University of Hawaii, has worked extensively in adapting teaching packages for training mid-level auxiliary health workers in a number of countries.¹¹ The Center for Educational Development in Health is also developing training materials for multipurpose health workers. CEDH has contacted outstanding programs for training village level health workers to obtain selected background information on the program and obtain such printed material as manuals, evaluation forms, etc., which may be of help to other training programs. A number of universities have made available the material

developed in their collaborative efforts with other countries in increasing health services in rural areas, i.e., The Johns Hopkins University manual for auxiliary nurse midwives developed in Narangwal, India.¹²

In England, TALC (Teaching Aids at Low Cost) has a number of aids that can be purchased for use in auxiliary training.¹³ The Appropriate Health Resources and Technologies Action Group,¹⁴ an information service whose purpose is to promote and support innovative health care and community development schemes, has documents pertaining to health training.

These are only a few examples of the materials becoming available to provide technical assistance to programs for training auxiliaries. If used, all such materials must be adapted to the local circumstances. However, there is no substitute for faculty members meeting together to develop a curriculum. The cross-fertilization of ideas, shared opinions on content and teaching methods which occur when faculty work together can unify a program and make it appropriate to local needs.

Orientation and Planning Period

Perhaps one of the greatest contributions that can be made to planning for the training program is to block out a sufficiently lengthy period of time for orientation and preparation of the curriculum. It is imperative that the teaching teams for auxiliaries have adequate time to become acquainted with the service program before setting educational objectives and preparing basic teaching plans and aids. Equally important, that time can be used to build staff morale. During the orientation and planning period, all persons engaged in operating a teaching program (teachers, administrators, drivers, clerical staff) learn to work together. In that way, they truly become a team, unified in their approach to the student.

Planning the Curriculum

There are several factors to be taken into account when developing curriculum for auxiliary training. Most important, the *curriculum should be appropriate to the health problems and traditional health practices of the community*. The goal is to prepare workers who will promote the health of the population, care for the sick, and provide relief from pain, if possible. Since health is not exclusively nor even primarily a product of medical care, the responsibilities of the auxiliary may be quite varied, depending on the local situation. Thus, the task the auxiliary will perform in the health sector should determine the type of training that is offered. This is especially true of primary care programs for rural areas.

Many countries have found they need to update the contents and methods of teaching and training health personnel in accordance with national strategies of primary care and community participation.¹⁵ A major

problem has been that personnel have been trained to carry out standard hospital and clinic practice patterns that are inappropriate for poor rural communities.¹⁶ Indeed, in areas as diverse as Wyoming, U.S.A., and the Cameroon, there is a need to change the medical education system to achieve the objectives set for rural health teams.¹⁷

If a functional analysis has been carried out as part of the planning process, the service objectives and the job description of the auxiliary should reflect the information obtained from that analysis. The curriculum can then be built upon local conditions and needed services.

Consideration should be given to the geographic locus of the workers. If the auxiliaries are to be located in a community hospital, district health center or rural health post, the curriculum should reflect the differences in types of problems seen in each setting. For example, if the auxiliaries are expected to work in a community health center, teaching management of the twenty most common complaints will enable them to deal with most of the problems they will encounter. The curriculum should also reflect the differences in information needed by auxiliaries who carry out routine tasks and those who are required to perform more varied tasks. Further, the curriculum should vary according to the degree of independence of decision-making that the auxiliaries will have.

Training should concentrate on the *tasks that the workers will be expected to perform*. The steps in developing such training are to list the major tasks or functions the auxiliary will carry out and the measures to evaluate performance. Then the specific activities necessary to accomplish each task should be defined as well as the equipment, drugs, forms and other supplies needed. Next, one determines the cognitive knowledge and the interpersonal and psychomotor skills that the student must learn in order to perform the tasks. Finally, one must translate the lesson plan into simple, easily understood words. If the auxiliaries learn in simple terms, it will be easier for them to educate others in turn.

Student Manuals

It is often helpful to develop a students' manual. The student can learn from it in training and then refer to it in practice. The process of putting the lessons into simple words and illustrations will also benefit the instructors. They will be better able to judge the completeness of the curriculum, its order, clarity and relevance. The manual should take into account the students' degree of formal education. It should give explicit instructions on the type of preventive and curative tasks to be undertaken and where and how to refer cases that are beyond the competencies of the auxiliary. The manual should be in a form easy to carry. For example, in India, a small handbook was prepared for community health workers to guide them in giving maternal and child health care. It is a simplified handbook that can be carried in the pocket or purse of the worker.¹⁸

Practical Focus of Curriculum

Most courses for auxiliaries are of a practical nature. They involve some lessons on simple anatomy and physiology, techniques used in curative care and information on medicines for common problems. Depending upon the functions of the auxiliary, the curriculum will be concerned with curative and preventive care, health promotion and community development tasks. It may cover the areas of communicable disease, maternal and child health, food and nutrition, family life education, accidents, acute minor problems, environmental sanitation, agriculture, animal husbandry, construction, transport and communications.

Always the curriculum must be *pertinent to the local area*. For example, in the Sudan's primary health care program, a growing awareness of the special needs of the nomadic population has led to a greater emphasis on the Nomadic Community Health Center Program of animal husbandry.²⁷

The curriculum should also pay particular attention to local problems of nutrition in children and pregnant and lactating women. Nutritional needs vary greatly from locality to locality, and the nutrition education should fit the specific area. In particular, teaching should emphasize locally available home grown foods. Auxiliaries should also be taught the therapeutic effects as well as risk of medicines sold in the community. Inadequate knowledge of locally available medicines on the part of the auxiliary may lessen the respect of the people. Also, the auxiliary should be taught to use the simplest possible materials available locally that can be replaced without recourse to outside sources. For example, it may be preferable to use soap found at the market rather than surgical alcohol that can only be found at a pharmacy.

The auxiliary also needs to be taught how to *prepare the various reports* that will be required on the job, a skill that should not be left to chance. The auxiliary should be trained to communicate, either orally or in writing, with supervisors, other health and development workers, and local authorities.

If auxiliaries are to *work in the community*, then the curriculum should prepare them to carry out a household survey, assess the problems of a community, participate in village meetings, cooperate with others on community projects, increase people's awareness of community health problems, and engage in health promotion activities. Students need to be prepared to maximize public participation in health programs.

Students should be acquainted with community problems before being taught how to deal with them. They must learn to take into account the local culture, social structure, and prevailing traditions when trying to implement any health program. Auxiliaries must also be able to recognize problems of community resistance and take necessary remedial action. Teachers of auxiliaries should be able to point out the anthropological, sociological and psychological principles that emerge from practical field experience in community health work.

Some instruction in *teaching methods* will make the auxiliaries more effective in health promotion when working with individuals, small groups, and large assemblies. Such instruction should not be limited to lesson plans or teaching aids, but should incorporate the arts of the culture. For example, auxiliaries might learn to convey health messages through storytelling, puppet shows, play acting, songs, dances or other events that would reach individuals in the community. At least one methods manual that deals with working with groups of different sizes and composition has been developed for community health workers.²² In addition to this general guide, several area-specific manuals contain instruction in community health activities. For example, such information can be found in a section of a manual written by health educators and a cultural anthropologist for the rural community health worker in Thailand.²³ Such information must be adapted to the local situation. In general, the methods should be acceptable to the culture and be simple and inexpensive.

Health auxiliaries may be expected to maintain and supply a clinic or to use special equipment on the job. If so, they should be taught *management techniques*, and *equipment operation and repair*. For example, training sessions could cover use and maintenance of refrigerators or bicycles, requisition of drug supplies, or radio medical communications.

A word of caution, however: there is a tendency for teachers to feel that the students must know everything; thus, the faculty adds more and more elements to the curriculum. This tendency Fendall calls "upward creep".²⁴ He stresses the need to remember that one is teaching auxiliaries to work in a defined area, in a defined capacity, with a predetermined set of tools. The curriculum should prepare the student for the actual situation, not the ideal. If the curriculum is too ambitious, the performance of the graduate will suffer. If the training is too comprehensive, it will not be intensive enough for adequate learning in a short period of time.

Recruitment and Selection

Recruitment and selection of students begins after the training program has been planned, the instructors selected and organized into a team, and the curriculum designed. (The exception to this, however, occurs when current health workers are being retrained to provide new services; for example, dispensary aides have been trained and used in rural health care in Venezuela.²⁵ Although all of the persons to be retrained may not be appropriate to the new role, they usually are all given the opportunity to learn.) There are as many ways to recruit and select auxiliary workers as there are types of auxiliaries. The process involves an interplay of personal and social characteristics with the cultural setting.

Minimum Standards

The first step is to set minimum standards for desirable characteristics of the auxiliary. The criteria may be established by health professionals.

members of the community or both groups. Health professionals at both the central and peripheral levels may be involved in defining the initial criteria. However, large bureaucracies may not be responsive to local input into such decision-making. Whether or not there is community involvement in setting the basic criteria for recruitment and selection, there at least must be community endorsement of the criteria.

There are often *cultural barriers* to recruitment. Some societies prefer males, others females, for a particular auxiliary role. Some train two types of basic health workers: male workers carry out tasks in sanitation, agricultural development and curative health services; female workers provide maternal and child health care and family planning activities. Or a village may differentiate worker activities by hygiene advice and pharmacy on the one hand, deliveries and feeding of young children on the other. In some countries, married couples are trained as a team to provide a gamut of preventive and curative health services.

Some programs set upper and lower *age limits* for their workers. Cuba, for example, employs young women as auxiliary nurses in the rural areas. One problem encountered there is that this age group is likely to marry, move, or have children and leave the health sector. Thus, program managers are continually faced with training replacements. Some young workers also see auxiliary positions as stepping stones to better jobs, perhaps in the urban areas, and do not remain long in their positions.

An innovative maternal and child health program in southern India has successfully recruited and trained village girls to work as volunteers or as health educators, health workers and health guides. These young women offer lessons in health and nutrition to mothers, distribute supplementary food, weigh children, keep records and carry out home visits. In order for this community health development project to operate in a village, the village must first request inclusion in the project, find space for the center, and must allow some village girls to work in the program. The program has had a rapid spread to many villages, which indicates in part the acceptability of these young workers to the community.²⁶

The criteria for auxiliaries may call for a more mature person by requiring, as in Kenya, a person to own land in the area, be recommended by other villagers, and be married with children. The purpose of such criteria is to *select a person who is respected* by and has the confidence of the people of the community and who will remain in the village providing health services. Again, some programs prefer married persons to persons who are single or prefer those who have had children to those who have not raised children. Other programs make no such distinctions.

There is no scientific evidence that any age, sex, or marital status group is better than another as a health care provider. However, some qualities may be more acceptable in one culture than in another, thus making some persons more effective than others in providing services in a particular setting. There is, however, a paucity of concrete information

concerning which characteristics of health workers are associated with success or difficulty in achieving acceptance in a particular setting. Assumptions about culturally necessary characteristics may be wrong. A study in rural Iran, for example, found that even in a Moslem society where the separation of the sexes is strictly observed by custom, both men and women can function effectively as village health workers, performing all the duties of which such a worker is capable.²⁷

The *economic base* of the service program may influence application requirements. Some government health programs require applicants to be unemployed; others prefer auxiliaries that have part-time employment in areas other than health. Still other programs seek applicants with sufficient economic resources to work as volunteers in the health program.²⁸

Literacy

In general, most programs require that auxiliaries be literate so they can read the training manuals, keep simple activity reports, understand written directions, and order supplies. Auxiliaries who work as medical assistants usually have eight to nine years of basic general education, while village health workers, such as community health aides or communicators, have only enough years of schooling to enable them to read, write and count. However, some programs have not had a pool of literate applicants available and thus have selected and trained workers who cannot read or write. In these cases, any required recording of activities may be done by another family member—e.g., an educated daughter or young sister—while the auxiliary carries out the necessary duties as health worker. Other programs have used color-coded cards to signify certain events that must be recorded. A system of pebbles dropped into different boxes can be used to count visits or health activities. In the Sudan, village midwives who are mostly illiterate are trained to distinguish medicines and drugs by color, taste, touch and smell.²⁹ Human ingenuity creates methods to fit the situation.

Some health professionals have suggested that a maximum educational level be set, arguing that the more highly educated applicants are more likely to cease being an auxiliary when a better paying or higher status job becomes available. They also feel that if too highly educated, the auxiliary will feel superior to the people in the community. At a minimum, applicants must be able to speak the language of the people, of the health center staff, and of the teachers. Students will have to communicate aloud in their own language as well as the language used for instruction and testing. If auxiliary training occurs in a language other than that which is locally used, then it is more likely that persons who are not as close to the typical villager will be selected for the training program.

Residency

The experience of many programs has been that it is best to recruit for work in rural areas students who themselves live in rural areas. Some programs try to ensure this by setting qualifications that the student must reside in the service area, own land, or have relatives in the area. Similarly, it is generally agreed that the most desirable person to work in a rural community is a respected member of that community. The general belief is that such persons share the values and outlook of the villagers, can talk to them in their own terms, and will be trusted and thus listened to in health matters. The acceptance of prescriptive advice from a village health worker may be dependent more on the length or strength of the worker's ties within the community than to any status or importance gained from being a health worker. An example of the importance of length of residence occurs in the report of a study of the social role of a rural midwife who had resided in a village of less than 2,000 for only two years. While known generally as an able and good woman performing a needed service, she was still not fully trusted in the community. The study authors quoted the reservation of a village woman, "She's only been here for two years, and we don't really know her insides and outsides."⁴⁰

Although many programs set residency requirements, others find the pool of resident applicants too restricted and thus look for non-residents to fill positions. A few programs have found that persons chosen from the community may be involved or identified with a particular political faction in the village. Special demands may be placed on the health workers because of these relationships. They may be drawn into political disputes and not be trusted by persons belonging to other political factions. In such a situation, it might be better to select persons who live in nearby communities and are free of local political alliances or to train a worker for each faction, clan or ethnic group existing within the community.

Another disadvantage to residency requirements is that if workers are required to live near the health center, they may be overly identified with the center and not reach people who live in the surrounding countryside. If case-finding and community surveillance are an important part of the auxiliary's job, then it may be advisable to look for applicants from the more remote areas.

Recruitment Process

Once criteria are set, recruitment of students can begin. Media campaigns should be kept simple and inexpensive. The information to the population must be very explicit with regard to the method of selection, training, activities, location of work and compensation. Key community individuals should be asked for recommendations. Political groups, women's clubs, and religious organizations should be canvassed for possible applicants. Workers in health-related fields should be notified of the program. Traditional or indigenous healers should also be considered for training

as auxiliaries. Traditional midwives have been recruited for such purposes in many places and have proved very effective. Indeed, several studies are available, such as those from Iran, Thailand and Turkey, that document the effectiveness of village midwives in family planning.³¹⁻³²⁻³³ Experience with other indigenous healers, such as *curanderos* or injectionists, is more limited, but they probably deserve more consideration than they have received.

In short, as many people as possible should know about the opportunity. This will not only assure the widest pool of applicants, it will also inform people of the health program itself. Some governments have prepared film strips and slides for rural communities so that the population will understand the functions of the new community health worker. The health manager should take this opportunity to educate the community about the services that will be available, to create awareness of health problems and to solicit help in working to solve the local health problems.

The recruitment campaign should be appropriate for the social and economic level of the local population. Posted job announcements or newspaper advertisements will not be effective if few can read. Requirements for photographs on applications are prejudicial to poor villagers who cannot afford them. Or, if women find it difficult to travel out of town, then a requirement that the applicant use a form only available at a district office will prevent most village women from applying. The recruitment process should truly be adjusted to local conditions and needs.

Recruitment does not have to be an impersonal process. In the Yemen Arab Republic young women provide nutrition and child health instruction in the home as part of a primary care outreach program of a hospital. In this Muslim area, families were individually approached by the program directors, the program explained, and permission requested of the family head to permit a daughter to learn to be a nutrition health auxiliary. Respect for the traditional culture, recognition of the importance of familial permission, resulted in the recruitment of effective health workers.³⁴

There should be a defined period of recruitment, with candidates either selected for training during or at the end of the recruitment period, according to circumstances. If the health program is to cover many villages, one may choose to recruit in several villages at one time, then select the total number of students after all villages have been covered.

Criteria for Selection

Students are chosen from a pool of candidates who have all met the minimum standards. Selection will be based on an assessment of the candidate's attitudes, personality, intelligence, motivation, skills and past experience. There are some methods of selection that have been developed; however, the relationship between standardized personality assessments and ability to work in community health and development is not known.

Most tests of intelligence are not free of cultural bias. Basically, the auxiliary needs to have common sense, honesty, a regard for the dignity and worth of his fellow man, and to be kind, supportive, sympathetic, and "not proud."

Probably the characteristic deserving the most attention is the applicant's *commitment and motivation* to working for better health of individuals and the community. This is usually judged in personal interviews or in brief essays by the candidates on why they wish to work as health auxiliaries. Descriptions of past experiences usually will disclose persons who have been of help to their neighbors. Demonstrated capacity is a good predictor of future ability to be of service.

Since health workers may be expected to teach better health care to the villagers, applicants will need to be able to communicate aloud and to speak the language of the people. They must also know how to listen. At least half the people seeking health care come for comfort; they need to talk with someone. If the auxiliaries are to offer personal curative care, it is important that they be able to listen.

How does one test for the *ability to work with others*? One test for ability to work in a group is to have group interviews of applicants, then observe each applicant's interaction with other members of the group and select on that basis. Usually a few people will stand out as being more sympathetic personalities or as having the ability to listen, communicate and work well with others. Some programs have had applicants play-act. They present applicants with a situation that might arise in health care and ask them how they would act. For example, how would the applicant persuade a mother that it is important to bring her child to a clinic for immunization or persuade a man to help his neighbors cement the well enclosure? Other programs have upheld the importance of technical skills, developing simple tests such as use of scissors or chopsticks to test finger dexterity. Some have had the candidate do simple calculations or write short reports. The important point to remember is that one should have in mind the skills that the worker will need to work effectively and then make the selection process appropriate for those skills.

Selection Process

The final selection must produce a student who is *acceptable both to the community and to the health service*. Some programs try to achieve this by letting members of the health service make the final selection from a pool of candidates suggested by the community. In some countries, the political authorities do not allow the community to select health workers; the community must accept the workers who are selected by the government health services personnel. In other areas, as in Mali, the Ministry seeks community approval for government selected candidates. In some localities, community committees make the final selection. In Alaska, just below the Arctic Circle, for example, the instructor goes to

the village to interview candidates jointly with representatives of the local health corporation. The local health corporation retains the final decision.¹⁴ Other localities convene public meetings and nominate health committees whose function is to nominate and select the health workers. Some auxiliary workers are selected at open public meetings held in the smallest administrative unit. In summary, *there is no single selection process*. The method chosen should be appropriate to the culture and to the expected role of the auxiliary following training. If the auxiliary is to be a community worker, then it is particularly important that selection criteria be set by community representatives and that maximum involvement in decision-making occur at the village level. Whatever the selection process, there must be whole-hearted community acceptance of the choice.

The Training Process

Teaching Methods

Most auxiliary training (except that of physician assistants) takes place in a relatively short period of time. Teachers can choose from a variety of teaching methods; however, instructors should select teaching methods appropriate to the educational objectives of the auxiliary training program. In most cases this will mean a concentration on demonstration, discussion and supervised practical assignment rather than an emphasis on theoretical material in lectures or textbooks. The instruction must be simple, accurate and to the point.

Classroom exercises should stress experiences common to the auxiliary's job. Practical demonstration is extremely important. For example, the teacher may demonstrate food preparation or infant feeding, which the student, in turn, will be presenting to mothers' groups in the health center or village. In the classroom, students may also have an opportunity to practice health education counseling for patients or health promotion activities for communities. The classroom is a place for the student to learn from his mistakes without fear of losing face or risk of imparting false information to others.

The instructor should concentrate on *increasing the students' capacity to solve problems*. Students may be asked to role-play or simulate a situation that may arise on the job or to present a problem that they have experienced in clinical or field work and describe how it was met. Faculty and students then critique the students' efforts at dealing with the situation. Another method, which does not put as much pressure on the individual student, is to divide students into small groups, give them a problem to solve, and then each group shares with the others the way they chose to solve the problem.

Some programs have used explicit protocols to instruct students and later guide their activities in compliance with standards of care. For example, auxiliaries working with the Papago Indians used combined

protocol and reporting forms to make explicit the tasks in assessment and treatment of gastroenteritis, anemia, respiratory infections, and minor acute health problems.^{36,37} Such protocols provide guidelines for care and performance of tasks. It is easy for the auxiliary to document what has been done, and the report is easily monitored. These protocols are especially useful if the auxiliary is to carry out a limited number of specific activities or to work with only one disease entity; they are less useful for training multipurpose workers or those who will work in the community. While protocols ensure a certain standard of care for specific medical or nursing tasks, they do not bring into focus the process of restructuring values, motives and daily habits of people that may be necessary to achieve certain health practices. Furthermore, the use of algorithms is highly dependent on the teacher's knowledge and appreciation of this education technique.

Programmed learning also gives students practice in making decisions. Students can move at their own speed and evaluate their own performance. However, this method is ill-suited to adults with minimal education. Another limitation is that it does not provide for any group interaction. Programmed learning can seem quite removed from more chaotic, complex reality.

In deciding which method to use, the teacher must consider the time required to teach the method and its effectiveness for preparing a specific group of students to do a specific job. In general, classroom instruction should be simple and repetitive and drill students in essentials.

Teaching Aids

All educational programs use some type of teaching aid or device. Books, manuals, models, clinical specimens, posters and other graphic arts, blackboards or flannelboards have been used in the education of auxiliaries. Teachers should familiarize themselves with the advantages and disadvantages of the different media, including consideration of cost, timeliness, convenience, durability, audience characteristics, and skill required for use.

These considerations are especially important for audiovisual media, which usually require expensive equipment and electricity to operate, although slides, filmstrips, microfiche and cassette recorders that use battery-powered sources or hand-viewers can be obtained relatively inexpensively. Films, transparencies, and other audiovisual aids can be effective if the teaching program has the resources to bear the costs and maintain the equipment. However, few programs do. Usually simple and basic teaching aids have been used in large-scale auxiliary training programs. For example, the smallpox eradication and malaria control program personnel have used diagnostic folders, projection slides and posters in auxiliary training.

Advanced technology has been tried in a few places. Videotapes have made possible the recording of student interaction with real or simulated

patients for later review by student and instructor. Television and radio have also made a valuable contribution to service programs that rely heavily on in-service education. However, the cost of initial purchase and maintenance of equipment, the special studio facilities required and the need for trained staff make such aids highly inappropriate for most auxiliary teaching programs in developing countries.

External donors sometimes offer to equip teaching programs with laboratory equipment and other expensive teaching aids. The recipient programs must be very practical about their capacity to maintain and repair such equipment. In addition to the problem of obtaining replacement parts and training people to make repairs, there is the added disadvantage that most equipment has not been designed for the climatic conditions found in many countries and thus is liable to require extensive maintenance.

Educational techniques such as audiovisual aids, teaching packages and programmed learning can help people acquire some of the information they need to function as health auxiliaries. However, the administrator should keep in mind what is known about the learning process. Classroom lectures and educational aids are inadequate in the most important areas: the technical skills required for diagnoses, the problem-solving skills required for proper treatment, and the group skills required to work in community development. These, research has clearly shown, can only be learned by doing. Teaching methods that place the student in an active role are far more useful than those which entail only a passive acceptance of instructions.¹⁶

Community Health Experience

Some type of clinical experience is usually included in most auxiliary training, but students also need regular and systematic community health experience to complement that part of their curriculum that deals with the community. Students may be assigned to visit villages and evaluate community health standards. They may carry out an immunization survey or weigh youngsters under five. Students may also be assigned a number of families for which they are responsible for providing health visits. They may counsel a woman through a healthy pregnancy. Such field experience requires time, transportation, careful planning and supervision, but it enables the student to work in a cooperative manner and gain valuable practical experience.

Role Models

Reducing the risks to patients and maximizing learning for students call for instructors who can supervise auxiliaries in practical clinical and community experience. Unfortunately, faculty members who are part of training centers or schools seldom see students outside the classroom.

Although it is usually possible for students who are to work as hospital auxiliaries or as health center workers to get adequate supervision in curative care, it is more difficult to provide students with appropriate supervisors for community outreach activities. To date there have been few instructors with the necessary village level experience to enable them to function as role models. Numerous demonstrations in developing countries have shown that the best role model for a village worker is not a doctor, nurse or other highly trained professional, but someone doing the best possible job in the role that the trainee is expected to fill.¹⁴ Outstanding auxiliaries can make that kind of good teaching supervisors. They provide a rare and valuable gift to the student — a vision of what can be.

SECTION V—PROGRAM IMPLEMENTATION

There comes a time, whether the auxiliary has completed training or is still undergoing practical field experience, when the auxiliary moves into the formal health system. This is the point at which the emphasis shifts from planning to actual program implementation. Problems of management and organization now come to the fore, providing a critical test of the stated and unstated assumptions made in the planning stage and in the construction of the curriculum.

Let us review the several steps in program implementation that should have occurred before deployment of the auxiliary. First, a funding basis and an approved budget must exist for the program, and the use of a particular type of health auxiliary must have the acceptance of political leaders, health personnel and the community. There must be a measure of agreement that the particular primary care program is necessary and that its success is of consequence to some segment of the population. All plans and agreements should have been developed through consultation with appropriate authorities and clearances obtained, in writing, from local as well as national officials.

Equally important, there must be an administrative framework *in place* to provide primary care services and the necessary support personnel. The program must start with the resources at hand and not be dependent upon additional supplies, transportation, facilities or personnel in order to use the auxiliary successfully, unless of course these resources will actually be available shortly after the initiation of the program. Also, the functional relationships between the auxiliary and personnel at the next level of the system, as well as those between the auxiliary and other health personnel at the same level, should have been clearly defined. Finally, the health worker's training should have been as simple, realistic, and practical as possible and organized so as to achieve the goals of the health program.

Effective planning and training are the best preparation for overcoming obstacles to the implementation of programs using auxiliaries to intervene in urgent and pervasive community health problems. But all obstacles cannot be anticipated. A flexible administrative approach is needed—one that combines principles of good management with awareness and responsiveness to the social context in which the program operates.

Introduction to Working Relationships

When the auxiliary is ready to start to work, he or she should first be introduced to the health system—one of the simplest, but frequently overlooked, acts. Since, in reality, there is no freestanding entity that could be called a “health system,” the auxiliary needs personally to meet citizens in the community, co-workers, local authorities and clinic and hospital staff. Any system is but a collection of people, and congenial social relationships are of chief importance. Proper introduction of the health worker, according to the customs of the community, also provides an opportunity to inform many persons of the program and solicit their advice and support. Observance of the social amenities are more important to securing cooperation than any number of perfectly performed health tasks.

Job Description

Part of the auxiliary’s relationship to other members of the health system will be defined by a written job description. It is extremely important that there be consensus as to the auxiliary’s duties and responsibilities and to where and how his time is to be spent. The job description should state the auxiliary’s tasks and indicate where, with whom and when they are to be performed; specify subsequent actions that may be required; and identify the supervisory structure and referral pattern. One criticism of a written job description is that it may prematurely “freeze” the role of the worker, or inhibit his ability to improvise and to adapt responses to the actual situation. Although latitude for personal expression is needed, there is less uncertainty and confusion in situations in which jobs are clearly defined.

Frequently the creation of a new program using auxiliaries to give primary health care requires that job descriptions be revised for other members of the health system. Effective support of auxiliary workers depends upon reorientation of the functional roles of all health workers at all levels of the system. Each category of worker has to be informed about changes in his or her duties and functions. Although there may be separate meetings for the different groups, it would be a mistake to conduct all informational sessions in isolation. All members of the health system need to understand the roles of the other members. This is particularly critical for members of the local health team.

Workshops and Seminars

One of the best ways to share role descriptions is through management training seminars or workshops. Drawing members of the health system together at the local and district levels to discuss policies and procedures will familiarize everyone with the nature of jobs to be done and the interactions necessary to meet the goals of the health program. In effect, these are short training courses, ranging from two-day seminars for com-

munication and exchange of information to more intensive week-long or longer workshops.

Seminars and workshops can help develop the capability to achieve effective national health services. In many areas, programs operate in isolation, communication is difficult and there are prejudices and barriers to collaboration. The Institute of Child Health in Nigeria has held several national workshops on health planning, management, evaluation, manpower, and related topics.¹ The Institute has found that through these meetings the participants build continuing professional relationships and personal friendships. One result is that common objectives become shared and understanding develops among people from different programs and localities and with different roles in the health system.

The seminar model can be adapted to provide a forum for introducing new types of health workers. Clearly, a critical issue in the administration of service programs employing auxiliaries is the scale of the operation. Introduction of the worker, acceptance by co-workers, and community support can be obtained more easily in programs of smaller size, where communication is less of a problem. Management seminars planned and held at local and district levels, but centrally coordinated, can preserve some of the freshness and flexibility of the smaller programs, while promoting the goals of a national health program.

The meetings should go beyond simply laying down rules for action. The reactions and suggestions of participants should be sought. In such meetings problems surface and can be dealt with by the participants, particularly if there is a strong, unruffled leader who is willing to consider all views. These discussions can alert the administrator to needed revisions of guidelines or preparation of new reference manuals. More realistic methods of team work may be developed.

Relationship to Other Health Workers

Teamwork

Seminars and workshops may be organized to reflect both the vertical and horizontal structure of health teams. Participants should include all clinical and administrative members of the health team. A collection of staff, however, does not automatically make a team. Frequently, there are barriers to the team approach of delivering health services. The organization of the system may be such that health care professionals act as individual entities. Emphasis on competition and personal success may impede integration. Gross inequities in pay may result in prejudices and poor performance. Team leadership may be sporadic, due to lack of personnel, or perhaps even be inappropriate to the nature of the task. Furthermore, persons trained at higher levels may be reluctant to delegate or transfer functions to persons of less training. In such situations, the concept of a health team may be questionable.

On occasion, a health auxiliary who was supposed to be a member of a team has ended as an individual solo practitioner. To integrate an auxiliary into a team successfully requires active initiation and education. If an organization exists that can support new forms of job sharing among workers, then worker-centered training seminars can facilitate the formation of teams.

Referral System

Inherent in the team approach to health services delivery is the patient referral system.² However, the success of referral systems in poor rural areas is questionable.³ From the point of view of both the patient and the health worker, there are considerable disincentives for referral to the next level of care, whether this be health center or hospital. Acceptance of team care rests, in large measure, upon referral being both actually feasible and agreeable to the patient. Referrals to the local health post after discharge from the hospital are also usually inadequate. Patient follow-up does not occur unless there is a village health worker who knows the community, has access to the homes, and is provided with accurate information on the patient's history and condition.

If the referral system is non-functioning, then the widest possible range of assistance must occur at the point of first contact. Protocols or diagnostic charts can be used to guide the health worker's activity. The guidelines for treatment must be simple and easy to apply. The protocols should be precise, stating clearly under what conditions, where and to whom to refer a patient. Unless they have easy access to the hospital or health center, few people will follow the referral route. Under these conditions, the underlying policy should be to devote more attention to providing adequate care for the majority of the people than to preparing elaborate technical backstopping for a few.

The role of the auxiliary and linkages with other health workers are defined during the planning stage of programs. How the auxiliary is to interact with other health practitioners is first worked out at a policy-making level (central and community), then described at an educational level, and finally is implemented at a management level. However, once the worker is in the field, the hypothesized relationships come down to actual interactions with people. Person-to-person, the links must be forged and relationships elaborated. To formalize this process and the principles by which it is to be accomplished is the task of the administrator.

Coordination at a Local Level

The key principle is that the work of the auxiliary should not occur in isolation. In actuality, there are usually several persons engaged in health efforts in any particular community or group of communities, even in the most rural or isolated. When needs are great and resources few, resources can be maximized by consolidation of interests, targeting of efforts and

coordination of activities. The available community people should devise a united approach to deal with certain key health problems, which are selected either for their frequency, severity or social impact. Dispersed, uncoordinated fragmentary efforts will yield minimal results. For the most part, of course, no coherent plan exists to govern multiple efforts; this must be developed for each locality. The administrator can bring together the concerned individuals to try to achieve some consensus as to group effort toward solution of critical health problems. Although there are numerous political and bureaucratic obstacles to such collaboration, the effort needs to be made.

Frequent staff meetings will optimize the process of building team relationships. Similarly, periodic meetings for information exchange may be necessary to clarify the relationship of the health auxiliary to other community development workers functioning in the same population group. Often such people as agriculture extension agents and home economists are performing similar, complementary tasks to those of the auxiliary (for example, provision of nutrition education), but due to lack of coordination, their combined health education messages may be contradictory and confusing, and may breed distrust.

Other Community Organizations

Possible resources for the auxiliary are community organizations that have health and development programs. Many communities have church groups or private associations, such as Alcoholics Anonymous, which develop activities to augment medical and paramedical services. The relationship of the health auxiliary to existing community development organizations should be clarified — is the auxiliary to be an active participant, occasional consultant, or bystander?

Just as there is a need to formalize tasks, functions and positions among members of the health team and between health auxiliaries and other health and development workers, there is a need to formalize or institutionalize the links with community organizations that have health and development programs. *Institutionalized relationships* are useful because they do not depend on individuals. Informal relationships among individuals are tenuous; they can be broken by personal disagreements or when the worker leaves the community. In institutionalized relationships, the development and maintenance of joint efforts do not depend on specific effective relationships or the particular way several individuals have worked together. Institutionalization acts to minimize the effects of personalities on one another. It minimizes relationships based on background, family connections, cliques, political alliances, or expertise, and maximizes formal relations based on defined policies.

Formalized relationships do not and should not eliminate personal relationships. In most places collaborative effort depends a great deal on

the regard each person holds for the other. Without *good personal relationships* between the health auxiliary and other health and development workers, institutionalized programs can come to naught. Both individual and institutional relationships are essential.

Often, working out relationships between representatives of organizations involves eliminating overlapping functions and duplication of effort. In a situation, however, where the task is to promote ideas, a multiplicity of sources for the health message is a benefit. If the different organizations can come together, select a critical health problem, identify a high-risk population, and develop intervention strategies appropriate to their respective activities, the efforts of each will reinforce the others. The sum total of information may be greater than that which any individual agency could provide; and, at least, the messages will not be contradictory. At the national, regional and local levels, administrators need to formalize the relationships between organizations with similar objectives, so that the process of coordination in the community is clear and natural for the auxiliary.

The administrator must be sensitive to the existing pattern of seeking health advice in order to make health education services of the auxiliary more effective. For example, a study in East Java, Indonesia, showed that rural health workers are only consulted in cases of illness and birth, while key individuals in the village play the main advisory role on other health related subjects, such as fees and sewage disposal, house construction, insect and rodent control. These patterns will most likely remain the same for some time, and the village administrator and leaders of social organizations will continue to play a more important role than rural health personnel. It is important that such key persons be knowledgeable about health principles and that auxiliaries link their health education efforts to those of such individuals.⁴

Job Location

Of course, where the health auxiliary is stationed will determine the specific links that need to be established. Most auxiliaries are assigned to a local health post or center, where they keep equipment and supplies, hold educational demonstrations, provide medical services to patients and receive supervision. The facility is a visible symbol of the health system, and the worker is seen as a part of the institution. It may serve to validate the position of the health auxiliary. However, it is not always necessary for an auxiliary to deliver services from a health facility. Indeed, there are good reasons for an auxiliary to be stationed elsewhere. Experience has shown that as few as twenty percent of a population use a primary health center. Distance from the center is an important factor in utilization. As long as there is communication between the auxiliary and the health post or center, the auxiliary can be physically located in the community. Services should be identified with people, not places.

The health auxiliary in the community may build very different relationships with other health and development workers than the auxiliary who is located in the health post. Fortunately, it is not always an either/or situation, for there may be several auxiliaries for a population group. In such cases, there are clear advantages to having auxiliaries in both locations. The worker stationed in the health facility has decreased travel time, increased time to spend providing medical services, and increased communication with other health workers. The auxiliary in the community is more able to do case surveillance, can be engaged in more preventive health and development activities, and has increased communication with the community.

The scheduling and staffing of the health center must be carefully planned. It is important to schedule regular times during which an auxiliary is in the community. Since travel is greatly increased outside the health facility, ample time needs to be allowed for the auxiliary to visit families. One method is to station an auxiliary in the community and another in the health center. Sometimes a system of rotation of duties is established. Unfortunately, the experience in many areas is that once the worker is located at the health center, it is difficult to get him to go out into the community again.

Traditional Practitioners

The health auxiliary may also need to work out a relationship with indigenous practitioners, including the village pharmacist and such traditional healers as *curanderos*, mediums, medicine-men, *shamans*, *marabouts*, herbalists, diviners and faith healers. During times of illness and misfortune, people rely upon long-established patterns of illness behavior. They will employ traditional home remedies of roots and herbs and will use the services of trusted and familiar healers. Because these indigenous workers are trusted by the people and have some rudimentary medical knowledge, there have been several attempts to incorporate them into the established health delivery systems through education or by training them as health auxiliaries.

Another way to incorporate traditional healers into the health system is to use them as consultants in special situations. Traditional practitioners throughout the world have a role very analogous to Western psychotherapists. The personal qualities of healers and therapists are of crucial importance in helping cure their patients. Certain techniques are used by therapists all over the world. For example, drugs, herbs, shock therapy, and dream analysis have been used by both traditional healers and Western psychotherapists. In addition, there are religious healing movements that attempt to alter the patient's life-style, self-conception or social interactions as a mode of treatment. Meditation and other Eastern relaxation and bodily control techniques have been seen to be effective in alleviating anxiety states and similar psychoneurotic reactions and for

psychosomatic disorders.⁸ In sum, traditional healers deal primarily with fears, anxieties and depressions. They explain illness in a way that makes sense in their culture. Indeed, they may play an important role in the integration of society.

Almost all of Western medical care is focused on biological aspects of healing. However, other approaches need to be considered as well. Studies have indicated that stress has an important role in the initiation of illness, perception of pain, and the healing process. If the traditional healer does no harm and provides a supportive, coping service, then the auxiliary should try to incorporate more traditional care into the delivery of health services. The point is that it is possible for the traditional practitioner to take part in the management of the patient without lowering accepted standards of medical practice.⁹

Community Mobilization

Volunteers

The remaining major association the auxiliary must build is a cooperative effort with community members to meet primary health care needs. The extent to which community members or volunteers can be effectively utilized in health services programs is not well understood. However, there are some data from surveys that suggest that local initiative and resources can be effective in certain situations. Of the 180 health projects in less developed countries that were surveyed by the American Public Health Association, Division of International Health Program, over half used volunteers and regarded them as very important for project success.¹⁰ Similar optimistic conclusions were drawn from a joint UNICEF-WHO study that reported on community involvement in health projects in nine countries.¹¹

Reports from many countries emphasize the importance of volunteers in personalizing communications about family health and placing these on a person-to-person basis. This is done differently in different countries. Cuba uses volunteer health workers who are elected representatives from a community block. The "public health representative" is responsible for educating block residents in reference to governmental medical services. For example, when a program to immunize children is conducted, the volunteer representative keeps the record of each child's immunizations and alerts the parents to a child's need for certain shots.¹²

Although volunteers have been useful in malaria control programs and have assisted health staff in sanitation programs, their most widespread use is currently in family planning programs. In Bangladesh, for example, a number of women have created a voluntary organization to reach people in central Dacca who were unreached by government population programs. In teams of two they contact women in their homes, giving information about nutrition, contraception and other health matters.¹³

Another promising use of volunteers is in the distribution of contraceptives in local communities in Latin America, Southeast Asia and Africa.¹⁴⁻¹⁵⁻¹⁶ Village and household distribution strategies maximize availability of contraceptives and increase the cultural acceptability of family planning efforts by involving community members in the process of offering services and providing for health needs.

Self-Help Groups

Auxiliaries are very much a part of the history of the community development movement. The community development approach to modernization was predominant in international work during the 1950's and early 1960's. Health was viewed as a major element in these programs. Efforts were directed toward improving waste disposal and village water systems, and village level workers received training in environmental sanitation and simple health education. For a variety of reasons, this movement had limited success, and attention turned to other methods of meeting the economic and social problems of communities. However, this approach has now re-emerged as part of the increasing emphasis on involvement of the community in planning, implementation, supervision and evaluation of primary health care services.

There are several models for achieving community participation. Some localities involve the community in health services by organizing health committees. Outstanding examples of this approach are the hundreds of health committees established in Panama with the help of the Health Education and Social Services Division of the Ministry of Health. These committees were given legal status. The accomplishments of these committees include: providing labor and raising funds to construct health facilities; buying medical supplies, vaccines, mobile units and equipment; paying salaries and expenses of service personnel; maintaining garden tractors; providing latrines for the poor; repairing buildings; developing fisheries; and recruiting volunteer workers for various health activities.¹⁷

In some areas, a village governing council or a village development committee has some responsibility for developing and administering the local health services. Usually the local leaders work in conjunction with a representative appointed by the Ministry of Health. Together, they control the community health workers' activities. This pattern is followed in some areas of India¹⁸ and in the Sudan.¹⁹

An approach that does not rely on government action is typified by Project Piaxtla, a self-help project in Mexico. Initially dependent on services provided by Americans, the villagers assumed increasing responsibility until their entire program, consisting of a referral and training center and a dozen health posts, was completely directed and run by *campesinos*. Then, they extended their efforts to include agricultural projects in an attempt to achieve self-sufficiency through experiments with hog and chicken raising.²⁰ In Zaire, a program of public health has

been carried on under the auspices of a religious group by a local hospital that depends largely upon village cooperation for its success.²¹

Spiritual Movements

There are other community mobilization approaches that are essentially spiritual movements. The Sarvodaya Shramadana Movement in Sri Lanka is based on philosophical principles of "loving kindness, compassionate action, unselfish joy, sharing, pleasant speech, constructive action and equality," which are expressed in practical action.²² Members of the movement secure participation of villagers in the development of cooperative and credit organizations, public works, educational programs and other activities. Health is but one part of their community mobilization work. Sarvodaya volunteers have organized community kitchens for adequate nutrition of children and preschool child care centers, as well as community health care programs that include children's immunizations, home nursing of the old and handicapped, first-aid services in the villages, and construction of latrines. Workers live with villagers, jointly build programs and then move on to develop programs in other villages. While obeying the laws of the state, the volunteers recognize and build on the inherent strength of the people.

Models of Community Participation

The community mobilization approach assumes the participation of local people in identifying needs, setting priorities, planning and implementing programs. This participation usually occurs through the organization of community members into a formal group. This group then helps make the community at large aware of health needs and problems, meets with health care providers to decide jointly upon remedial action, and cooperates with health officials in carrying out health programs and campaigns. Ideally, programs should spring from local initiative and be put into effect through a combination of local labor and resources and technical assistance from health practitioners. The role of the village health worker is to encourage, even inspire, villagers to join this process.

In a review of the community mobilization approach, Foster discusses both the shortcomings of this model and the current prospects for its success in this decade. He argues that as education becomes more widespread, standards of living rise, communication increases and political institutions become more representative, local participation will become even more effective.²³ There are other reasons for optimism. Death rates are decreasing and people can be more confident today that their children will survive to adulthood. There have been improvements in the status of sanitation and immunization over a generation ago. A major disease—smallpox—has been eliminated. People now have some basis for believing they are not entirely subject to the fates; they can take actions that can result in a change of health status.

There is also evidence that health services have succeeded in influencing rural attitudes toward health care. Banerji found in thirteen villages in India that many people were in favor of obtaining Western medical services for major medical care problems, irrespective of social, economic and regional considerations. However, the availability of services and the capacity of patients to meet the expense kept this need from being met.²⁴ Changes are occurring in many communities as basic health services are being extended to remote villages. In a Chilean community, for example, rituals once were performed for a child showing symptoms of worms. Now the child is taken to an auxiliary for a remedy. The auxiliary works out of a house built by the community, giving advice about health and diet, disease prevention and cesspool sanitation. It is hoped that the day will soon come when a child's worms will not only be cured, but will be prevented from occurring in the first place.²⁵

Constraints to Community Cooperation

There remain, however, many impediments to community mobilization. Rivalries and jealousies can still rend the social fabric of a community and make it difficult for individuals to join together to improve health conditions. Changes in the national economic situations can place severe restraints on cooperative effort. People may be willing to carry out improvement projects but may lack the necessary resources. A major issue in community development work is who pays for equipment, supplies and transport. For example, a project in Iran demonstrated that village health workers within a short period of time could effectively stimulate awareness of the need for environmental hygiene and sanitation improvement and could catalyze action. However, participation of the villagers was hampered by the lack of material, necessary equipment, and funds.²⁶ In other localities the existing health services may be working at such a low level of efficiency that community members may not use the services. Those who do may have little hope of improving the inefficient services to meet local felt needs for medical care better.²⁷

The experience of several projects suggests that the psychological contribution of village health committees is greater than their material contributions of labor or funds. A frequent argument in favor of community participation is the importance of the role of formal groups, such as health committees, in getting the community to accept both the health program and the worker. An example of this was a pilot program in India to train traditional birth attendants in the use of a kit for deliveries and in new post-delivery practices. Analysis of the initial results indicated the experimental program had failed, largely because there had been no effort to prepare the community for the program. The program organizers concluded that the community was unaware of the program, did not appreciate it, maintain it, or even accept services at times. They recommended that a village health committee prepare the people by increasing their

awareness of the health problems and the reasons for the changes in post-delivery practices by the retrained traditional birth attendants.²⁸ If the consumers of health services know the functions expected of auxiliaries and the reasons for those functions, they will know what to expect from the auxiliaries and how to utilize their services effectively.

Local Initiative

Although most of the emphasis has been on what the community can do to promote health services, some persons have reflected on the effect of health services on the people. Based on a study of approximately forty rural health programs in South and Central America, David Werner developed a theory that programs fall along a continuum between community supportive and community oppressive functions. Community supportive programs are those that help the people care for their own needs by encouraging responsibility, initiative, decision-making and self-reliance at the community level. In contrast, community oppressive programs are fundamentally authoritarian and are carried out in such a way that they encourage greater dependency. Community supportive organizations work on the assumption that even people with little formal education have the native intelligence and potential will to meet most of their basic needs for and by themselves. They view institutionalized health care as sustaining a minimum of community involvement and, perhaps, as distrusting individual initiative.²⁹ According to this formulation, it is questionable whether ministries of health should ever be expected to assume responsibility for basic health services.

Health administrators, then, must go beyond the problems the bureaucracies present and anticipate the linkages the auxiliary will need, in a manner that will encourage local initiatives. They must understand how to build team relationships, facilitate the patient referral system, and clarify relationships of the auxiliary to other community development workers, community organizations and traditional health practitioners. The administrator must recognize that community health workers are subject to conflicting loyalties and allegiances as they try to balance the need for fostering community self-reliance in health matters with that of supplementing their own efforts through the health care system.³⁰

At the least, how the auxiliary will be linked to the community will rest on the extent to which the villagers can determine developmental priorities. Whatever the degree of autonomy of the health service, the health administrator should be urged to expect the auxiliary to raise the local people's awareness of health problems and work with them in solving problems.

Supervision

The performance of auxiliaries depends to a large extent on the quality of supervision provided.³¹ The importance of supervision to the success

of community health programs employing auxiliaries has been stressed by almost every person who has ever worked in such a program. Yet, the difficulties of providing sufficient supervisory personnel, plus transportation and supplies, continue to make the support system the weakest element in an auxiliary program. In rural sections, for example, there is a problem in simply getting the supervisors to the area. Much of a supervisor's time is spent in travel.

Responsibilities of Supervision

The objective of supervision is to help the worker to do a better job; however, the nature of the supervisor's effort will shift over time. During the educational period, the supervisor-trainer acts as a preceptor and role model for the student. Once the auxiliary has graduated and is on the job, the role of the supervisor becomes more complex. Ideally, the supervisor should have the type of clinical and community experience that equips him or her to give technical advice, review performance, provide continuing education, handle administrative matters, offer emotional support to the auxiliary and act as an advocate. The supervisor will pay attention not only to the performance of the auxiliary, but to the conditions under which the auxiliary works.

Supervision is influenced by the type of situation in which the auxiliary is working. The location of the auxiliary—whether in a health services facility or in the community—and the tasks to be carried out will affect the nature of the supervision. In an urban health facility, the supervisor will be called upon for consultation and coordination, but in a rural area, the auxiliary will have less immediate recourse to the supervisor and will need more continuing education. Since in most rural situations auxiliaries provide health care under conditions of remote supervision, this places a premium on their internalized sense of responsibility and the quality of their preparation for their specific job. Contacts may be too infrequent for the supervisor to direct and inspect the performance of the auxiliary adequately. In order to help the worker do a better job, emphasis must necessarily shift from management of daily activities to providing more continuing education.

Models of Supervision

The question of who the supervisor should be is sometimes determined along professional lines (e.g., nursing auxiliaries are supervised by nurses and sanitary assistants by sanitary inspectors). In general, a worker is supervised by the person at the next level of training consistent with the job to be done. Since physician's assistants and nurse practitioners carry out medical curative tasks, they are usually supervised by physicians. The nurse practitioner, in turn, may supervise the clinic nurse and the physician's assistant a village health aide.

The village health worker often is at the end of a chain of supervisors. In Bolivia, for example, the health promoters are supervised by nursing

auxiliaries, who are supervised by technical auxiliaries, who are supervised by professionals on the outreach team.³²

More and more programs are beginning to use an exceptional, experienced auxiliary as a supervisor. Such supervisors are familiar with the demands of the job and are realistic about resources and performance. They have evidenced commitment and motivation. Their recognized excellence inspires the workers whom they supervise and their experience gives confidence. They serve as role models for the beginner and as leaders to other auxiliaries.

Sometimes the technical and professional supervision of an auxiliary is separated from administrative and disciplinary functions. In the government rural health development program in Kenya, the overall supervision of a community based worker is assigned to a health center. However, the pressure of their own duties prevent the center's staff members from actively supervising the village worker; thus a new post of trainer and supervisor had to be created.³³ In Alaska, medical supervision is maintained through regular radio contact between auxiliaries and the nearest hospital, while public health nurses or physician's assistants do the administrative supervision.^{34,35}

To the extent the auxiliaries are far away from health centers and visited rarely, they will need a greater tie to the community. In rural areas, the community may be providing part or all of the auxiliary's wages, housing and transportation. In return, community leaders may wish to control the auxiliary's work. In Central Java, for example, health cadres are coordinated by the village administration.³⁶ In other localities, the right to dismiss a worker or take corrective action belongs to the village health committee. While this policing function at the local level is necessary, it is equally important that the health system provide the technical support that will help the auxiliary become more competent.

Multiple Supervision

Occasionally, auxiliaries have more than one supervisor because their job incorporates many different activities, some of which takes place in the clinic, others in patients' homes or the community. In Liberia, for example, the physician's assistant and the sanitary health inspector are responsible for training and supervising health workers in neighboring villages, since village workers promote both sanitation and health and dispense simple routine treatment.³⁷ Having multiple supervisors can become an acute problem for multipurpose workers. They may have a different supervisor for malaria control, family planning, maternal and child care and other health areas, each of whom give suggestions. The auxiliary has the problem of coordinating these suggestions and meeting all expectations unless a single individual is used as a multipurpose supervisor.

The problem of multiple supervision, however, is not unique to a multi-purpose community worker. Auxiliaries who work in a health center or hospital with a large staff may also find themselves squeezed between conflicting advice. There may be many persons, too, trying to direct the auxiliary's activities. In such situations, the health administrator must assure that other members of the team recognize and support the leadership of the auxiliary's designated supervisor. There may be several guides, teachers, or consultants for the auxiliary, but there should be only one boss.

Obstacles to Supervision

The best supervisors are more than just good practitioners. They have to understand and support the objectives of the service program and the job assignment of the auxiliary. Sometimes the supervision of a community based auxiliary who works alone is assigned to a local physician. Unfortunately, the local physician may *lack the motivation* to support the program, viewing the auxiliary as providing inferior care. If so, a more appropriate supervisor should be appointed.

There needs to be continuity in supervision. The supervisor and auxiliary must get acquainted and come to know and trust each other. Several rural health programs have experienced problems in the *rapid turnover of physicians* who serve the rural sub-centers and work most closely with the auxiliaries. The *Venezuelan Medicina Simplificada* program, for example, provides basic health services to the country's rural population. The program employs non-professional auxiliary workers to provide maternal and child care, immunizations, health education, emergency care and collection of demographic care. Unfortunately, the supervising physicians tend to move frequently, so that often the supervisor may not be well acquainted with either the auxiliary or the local health problems.⁶

There are some impediments to achieving effective supervision that are inherent in the nature of the job. The supervision of multipurpose workers is much more difficult than for unipurpose workers. In a program where the tasks and schedule are well defined, as in the smallpox program, the supervisor knows exactly where the workers will be and what tasks they will be performing. Under such conditions it is possible for program administrators to institute close supervision and surveillance of field workers. However, management tends to break down when *tasks and schedules are not well defined*. Programs in India, Bangladesh and Sri Lanka, for example, have experienced a period of uncertainty in general health services supervision when they changed from unipurpose to multipurpose workers.

Support versus Policing

The tension between the basic elements of supervision also makes for difficulties. Supervisors are expected both to discipline and provide supportive help to the auxiliaries. These two aspects of supervision—what

Fendall has called the disciplinary-administrative and counseling-educational roles³⁹—are in opposition. The auxiliary in difficulty may be reluctant to consult the supervisor for fear of being judged as failing on the job. The supervisor may feel caught between demands of management to enforce rules, regulations and procedures, on the one hand, and the needs of the auxiliary for support and individual development on the other. The tension is a real one. There is a need to monitor performance and to assure standards are met—unfortunately, there are workers who steal drugs or do not report to their jobs. There is also a pressing need for encouragement and continuing education of the auxiliary. The worker is better motivated and learns more with supportive supervision. Supervisors must recognize this dual role. The more they understand the actual conditions under which the auxiliaries work and the nature of their training, the more effective they can be in choosing the right action for the circumstances.

Short- versus Long-range Objectives

Sometimes supervisors get so caught up in the day-to-day flow of work that long-range objectives get lost. They are in the communications link between the auxiliaries and the other parts of the health system. However, much of the time they transmit orders, check on supplies, receive reports on drug use, review clinic attendance, and deal with problems of missing forms. In an urban health facility much time will be spent coordinating the activities of various people. In a rural area, supervisors are more likely to be dealing with problems of supply and maintenance, since rarely does an effective logistical support system exist for the auxiliaries there. In Papua New Guinea, for example, many patients are treated by outpost orderlies, health extension officers, nurses and other auxiliaries. At least sixteen factors were identified as affecting the supply of drugs to such medical auxiliaries. The majority of these factors neither the auxiliary nor supervisor could influence.⁴⁰ In the midst of facilitating the regular flow of work, supervisors in both urban and rural areas must be able to direct the auxiliary activities to meet the goals of the program. Preventive health activities in particular need continual emphasis.

Guidelines to Effective Supervision

Styles of supervision differ. At a minimum, the supervisors are expected to be fair, consistent and respectful. They would also be wise to encourage open communication by being good listeners. Continually correcting the health workers will undermine their confidence.

Supervisors also need to maintain the confidence of patients in the auxiliaries. When supervisors are called upon for consultation, the patient's condition may require their diagnostic and treatment services. This is a delicate situation. Supervisors must not usurp the role of the worker. The auxiliary should remain in the room and be involved in the patient's care.

For example, the auxiliary could take the history and relay it to the supervisor.

Techniques of Supervision

The tools of supervision are few. A written *job description* and a well defined schedule of worker responsibilities are helpful. However, the supervisor should review the schedule with the worker because the job may actually be different from that described. *Joint review* of the auxiliary's activities will increase the understanding of both supervisor and worker. Another supervisory tool is a *manual or guide*, perhaps the same one the auxiliary used in the training program. An operations manual, such as the one for village health workers in Nepal, can serve to focus attention on the most essential actions required of the health worker and reinforce the overall goals of the program.⁴¹

Supervisors can choose from a variety of methods to identify needs and increase the competency of the workers. Depending upon their auxiliaries' location and role in primary health care, they can schedule individual and team *conferences, staff meetings, field observations and continuing education sessions*. However, an effective supervisor will observe the auxiliaries at work and will not simply rely on conferences for information about their activities. If the situation permits, frequent staff meetings should be scheduled, at which the auxiliaries are expected to be active participants. Supervisors can use the technique of group supervision to facilitate information exchange on activities, present alternative methods, and give group support to those who have difficult job assignments.

Supervisors should accompany the auxiliaries during their initial job placement and help them get started. Periodic meetings should then be scheduled, with provision for immediate contact in emergency situations. If possible, supervisors should plan to meet with the auxiliaries more frequently during the first six months to establish whether performance objectives are being met, and to give them technical and supportive help to meet the challenges of the new job assignment.

In urban or district health facilities, supervisors usually are in regular direct contact with the auxiliary. For the auxiliary stationed in a community or a rural area, the number of *regularly scheduled supervisor visits* per year will be influenced by the supervisor-worker ratio, the distance and terrain to be covered, and the type of transportation available. Although conditions may be unfavorable for frequent visits, most programs have tried to achieve a supervisory visit to village level health workers at least one day every two months.

Since the auxiliary's job security and promotions depend on information about how well he is doing his job, the supervisor needs to schedule regular and systematic *performance appraisals*. This may be a special appraisal, not part of regular supervision. The criteria of evaluation should be known to the auxiliary. (Some ways to assess performance are discussed

in the section on evaluation.) The assessment should always be reviewed with the auxiliary, so that supervisor and worker have an accurate appraisal of current activities and can plan together for any remedial action that may be needed.

Training Supervisors

The program administrator should provide special training for supervisors. A short course should be given to everyone in this capacity. It should cover program objectives, job definitions of the health team, functions, styles and methods of supervision, and potential conflicts on the job. The course should be tailored to the supervisor's educational and professional background. It should be appropriate to the type of supervision required for a particular type of auxiliary in a particular setting. The more practical the instruction, the better. If possible, the supervisor should have some time to learn on the job. It will immeasurably facilitate learning if the course instructors have themselves been effective supervisors of auxiliaries so that they can pose real life situations for discussion.

A "three-way role play" is a method to simulate actual supervisory conferences. This technique has been used successfully in Tunisia in preparing supervisors for auxiliaries with newly expanded roles.⁴² Three people are chosen to act out a work situation: one plays the patient, the other the auxiliary, the third the supervisor. After the simulated patient encounter takes place, the supervisor-actor conducts a supervisory conference with the auxiliary-actor, evaluating his performance during the patient encounter. The supervisor-actor's remarks are then critiqued by the class or instructor. Additional insight into the supervisory process may be gained if the three actors are asked to relate what they felt during this process.

Support for Supervisors

The program administrator will also need to provide the auxiliary's supervisor with back-up support, and so on up the line. If possible, advanced managerial and administrative training should be furnished to key personnel at the district level. The Danfa Project in Ghana is an outstanding example of an intensive approach to increasing the management capability of a rural health services delivery project in conjunction with recruitment and training of health auxiliaries.⁴³ The point that cannot be forgotten is that effective administrative support of auxiliary health workers is absolutely dependent upon the motivations and functions of all health workers at all levels of the system.⁴⁴

Management Information Systems

Monitoring Performance

Successful management of auxiliaries requires timely feedback on their activities and a mechanism for assuring work accountability for such

items as drugs and supplies. There is also need for an effective information system that relates work experience to training in order to develop needed in-service training and revision of initial training programs. Unfortunately, standard methods of supervision are not as effective in monitoring performance when auxiliaries are dispersed over a relatively large area and when there is a shortage of health professionals for supervision. One of the challenges facing the implementation of primary care programs is the development of mechanisms to monitor performance despite infrequent contact between the auxiliary and supervisor. Less attention is usually given to this need for management information than that given to information for planning.

A system of statistical reporting has frequently been employed to supplement direct supervision. The auxiliary may be required to record the number of patients seen or latrines built or improvements made to the water supply. Since there are numerous activities that can be monitored, the critical issue is to select those activities or functions that are most important in terms of the goals of the program. In addition to the types of activities, a management information system should specify the amount of time the auxiliary spends on the job, taking into account concentration of population. In that way one can understand the level of activity in relation to the size and dispersion of the target population and the number of activities performed.

Problem Identification

To be truly useful, a management information system should be oriented to problem identification and decision-making. It should provide information on how well a health program is working and identify obstacles to performance. In addition to providing information on auxiliary activities, it should also provide data on the workings of the entire support system in a regular, systematic fashion. This need not be a complex, expensive endeavor. For example, in Cornwall County, Jamaica, where they are developing pilot districts in primary care, the functions of a management information system are carried out by a "Problem Solving Committee."⁴⁵ This committee is composed of parish public health nurses and the county medical officer, nursing supervisor, health administrator, and training officer. The committee meets with members of the primary care staff in the pilot districts of each parish to identify problems in the development of pilot areas and to suggest interventions at the parish level. Upon revisiting, they determine the extent of any interventions that have been made, and see if further action is required.

The Jamaican primary care approach relies on community health aides and district midwives for the broadest possible spread of health coverage. The committee does not focus just on the performance of these auxiliaries but tries to understand the functioning of the entire primary care system. They may identify problems in building maintenance (e.g., wasp infested

rooms, leaking water taps, lights not working); supply problems (e.g., inadequate supply of records, ineffective methods of ordering and dispersing drugs); or training needs (e.g., in-service training on completion of monthly reports, taking temperatures, pulse and respiration, or upgrading skills in post-natal exams and immunizations). This type of management information system permits two-way exchange of information. It alerts county personnel to problems of local health centers. It permits the county health personnel to develop a consolidated list of parish needs in training, maintenance and supplies rather than just respond to crisis situations.

This approach is quite promising when primary health care services are being developed on a pilot basis. It may not be as useful in other cultural settings or when there are many established services to cover. It may be more advisable to rely on a statistical reporting system.

Reporting Systems

The limitations on reporting systems are well known. Auxiliaries may not have had sufficient schooling to record events accurately. The time required to fill out reports may reduce the amount of time they can spend in community work, case surveillance or other preventive health activities. The reports may also focus their attention on the numbers of persons seen rather than the type and quality of services provided. Furthermore, management information systems may make the auxiliary more responsive to the demands of the formal health system than to the needs of the community for certain kinds of information. In the Kasa project, India, for example, it was found that written reporting was an inadequate and, at times, inaccurate gauge of either activities or prevailing problems.⁴⁶ Even if the information gathered is appropriate, the system can become overloaded with statistical data that few can use. The sheer volume of data can prohibit meaningful analysis and rapid feedback to the auxiliary.

There are a few published reports on requirements for effective data collection systems carried out by auxiliaries. The Center for Disease Control, U.S.A., has carried out in developing countries surveillance projects for selected diseases. The system of data collection is based on the use of paramedical personnel with little formal education or training. In a review of nutrition surveillance activities it was concluded that the data collection was effective if paramedical personnel had adequate compensation and day-to-day supervision by middle level personnel.⁴⁷ In Malawi, another approach was used to assess the effectiveness of a national program of under-fives clinics largely staffed by auxiliaries. Cole-King points out that the data collection system was devised on the principle that data should be limited to what can be accurately collected by field staff in relation to other work done and what can be usefully handled and analyzed at headquarters level.⁴⁸

The simpler the reporting system, the better. One program used postcards on which to record infant deaths. The postcards served to alert the

supervisor, who then would investigate the deaths. Eventually this resulted in more appropriate management criteria for certain diseases at the local level.

Protocols

Quality of performance—such as skill in medical, nursing or health education tasks—is best assessed by direct observation. However, the Indian Health Service of the U.S. Public Health Service has found that a significant amount of performance monitoring can occur without face-to-face contact through use of a clinical protocol.⁴⁹ The protocol guides the auxiliary through the problem-solving process and links specific health care tasks to a defined task structure for certain patient problems. The auxiliary sends a copy of a completed protocol to the supervisor, who determines if the required information items were collected and the correct assessments and treatment plans made. The supervisor then makes on-site visits to those auxiliaries whose protocols indicated deviations from acceptable levels of patient care. This method allows for the most infrequent contact between auxiliary and supervisor, yet provides a basis for objective and task-oriented supervision that can be performed either through direct observation of an auxiliary's performance or retrospectively through a review of completed protocols. The approach requires design and testing of protocols for prevalent health problems appropriate to the skills of the auxiliaries employed. It also relies on written forms and an effective communications system for transmitting completed protocols.

Communication System

A communication system has functions other than monitoring performance. Chiefly, it should strengthen support to the auxiliary by making possible consultations about infrequent, unusual or emergency situations. It can also be used for handling administrative queries pertaining to supplies, transport, or pay, and as a mechanism for continuing education or in-service training. It provides a means to refer patients to the next level of care; or conversely, to inform the auxiliary about patients who are being returned to the community and who require follow-up care. It can serve epidemiological purposes by tracking patients, such as migrants, from mountain to valley. To fulfill these functions, a communications system *needs to be interactive*. Communications should flow in both directions—to and from the auxiliary.

No single communications system will provide the total solution to any problem or be appropriate to all cases. Some programs use runner systems as a means of communication, some have used homing pigeons to carry messages, others use helicopters. The Flying Doctor Service in East Africa has light aircraft to supplement extensive radio links.⁵⁰ In the past half century there has been increasing experimentation with telecommuni-

cations to support health care systems. Most common are radio-type links, including broadcast radio, shortwave, citizens' band and satellite. The main criticism of telecommunication systems are that they are too complex, may require special facilities, equipment, trained staff and extensive maintenance, and are usually too expensive. However, a recent study found that radio services were an equally or considerably more effective means of providing social services than were conventional delivery systems, given that the population to be served was dispersed over a relatively large area.⁵² The relative cost of telecommunications is dropping as manpower costs rise. Inexpensive communication units, such as the citizens' band radios in use in Micronesia, are now more available. Although most service areas will not find telecommunications more desirable than face-to-face encounter, some will find it practical and affordable. Just as with other aspects of auxiliary programming, the ideal is to *keep communication simple and inexpensive*.

Consultation and Continuing Education

Two-way telecommunication systems permit interaction between health personnel in regional hospitals and auxiliaries in village subcenters, health units or health posts. The primary purpose is to provide consultation and emergency aid, although the system may also be used for referrals, personal messages and other matters. One method of operation is to set aside a specific period each day for discussion between the supervisor or consulting physician and auxiliaries in the field. A roll call procedure is initiated for medical traffic from each of the localities where auxiliaries are stationed. In remote areas of Alaska, housewives trained as community health aides are linked by radio to hospitals. The experience there has shown that a good deal of incidental learning takes place as the health aides listen in to the cases being discussed in all communities. The open party-line radio permits the aides to hear both questions and answers. Since the problems encountered are similar among localities, the information imparted to one worker is a means of upgrading the competency of all workers. Aside from this set period, it is desirable that all sites be able to initiate emergency calls twenty-four hours a day.

More formal continuing education is sometimes offered by radio. Health professionals will give short talks on subjects appropriate to the auxiliaries' work. Study materials may be mailed to the auxiliaries in advance so they may prepare for the lesson. The radio lecture usually ends with an interactive question and answer period.

Administration and Management

Telecommunications can also assist in administration and management. In ten villages in Guatemala, auxiliaries equipped with radios devote more time to administrative matters, such as requesting gasoline or queries about pay, than they do to technical consultation.⁵³ The extent to

which the radio contact is used for such management purposes was documented by one study in Alaska which found thirty percent of the airtime was taken up with administrative functions.⁵⁴ Such reporting is most effective when messages are given directly to the person in charge and not relayed through intermediaries.

Morale

Two-way systems have a positive impact on health workers. For example, one benefit of a two-way radio system in Guatemala was improved interpersonal relations among the health workers.⁵⁵ Even less direct contact can prove favorable to morale and job satisfaction. In parts of Syria, a half-hour a week of broadcast radio is devoted to health personnel. They may send a card to the station describing the situation in patient care and ask for explanations. Perhaps greater than the increase in knowledge is the decrease in the auxiliaries' feelings of isolation.⁵⁶

Telecommunications is not a panacea for all problems in supervising workers in dispersed areas. However, if the system is affordable, easily operated and maintained, and meets the needs of the particular area, it may prove to be a significant factor in improving health care and increasing patient safety. Auxiliaries operating such equipment will, of course, be trained in its use and repair. They should also receive instruction in the ethics of discussing medical and social problems of patients. There is no privacy on open party-line radios.

The health administrator should be careful that the use of a telecommunications system does not discourage adequate auxiliary training or self-reliance. Above all, if a telecommunications system is instituted, it should supplement, not substitute for person-to-person contact. Supervision needs to be personalized. Although information can be conveyed by electronic equipment, the health worker ultimately needs human contact.

Continuing Education

One of the tasks of a supervisor is to bring together effectively the work situation and training. By monitoring performance, the supervisor can determine if the training program has been relevant and the material covered appropriate and evaluate the need for additional continuing education and in-service training.

Need for Continuing Education

Continuing education is an essential part of field supervision and administration. Planners and health administrators must appreciate and be committed to a vigorous program of continuing education or in-service auxiliary training. Health workers should understand that education and training are not finished at the end of a formal training program. There

are several reasons why this approach is crucial to the success of auxiliary programs.

The purpose of continuing education is to develop further the range and competence of the auxiliary. Only a specific set of skills are taught during the initial training program. These skills need to be maintained, improved and extended if the auxiliary is to do the best possible job. A less tangible, but frequently cited benefit of continuing education is the stimulation it offers to auxiliaries who are geographically isolated. This is particularly important for rural health workers, who may never see other colleagues except at the refresher courses.⁵⁷ The stimulation from meeting with other workers and sharing common problems can boost the morale of the most isolated auxiliary. It is generally believed this lift of the spirits will increase job satisfaction and length of service.

Another reason for a planned program of continuing education is based on the assumption that the role of auxiliaries will change. Often, planning proceeds as if tasks and roles were permanently established, yet a constant feature of modern life is change. Over time, new scientific discoveries can affect the activities of the auxiliary. For example, the recent development of a method to treat children with diarrhea in the home through rehydration requires a different set of skills on the part of the auxiliary. Similarly, basic health needs, as defined by organized health services, may change. Furthermore, experience has shown there is an increasing demand for health services as people become more aware of their health needs and become convinced that something can and should be done about their problems.

External factors may bring about changes in the auxiliary's job. Alterations in the physical environment can cause an upsurge in disease, such as an increase of schistosomiasis with the construction of dams. Or, extreme climatic conditions, such as drought or floods, may affect market prices and food production, and these, in turn, may affect the nutrition of children and pregnant and lactating women. Migration and fluctuations in the birth and death rates can alter population size and composition, necessitating greater concentration on special services such as maternity care. The control or elimination of an endemic disease in an area can make a considerable difference in the scope of activities of an auxiliary. Retraining will make possible the transition from a unipurpose worker (e.g., smallpox worker, malaria surveillance worker) to a multipurpose worker. In addition, one can expect changes in the health system itself, in the number of health facilities and in their manner of staffing and structure. Programs may be altered for the sake of efficiency; perhaps certain workers are not being effectively utilized or some type of services are inefficient. As any of these numerous changes occur, new responses, new knowledge, and skills will be required of the health worker.

Publications

The "State of the Art" study by the American Public Health Association found that, in general, field health workers in less developed coun-

tries are not part of an informational network that would enable them to stay abreast of experiences elsewhere. This finding is particularly critical for auxiliary programs.⁵⁸ Books, newsletters and journals keep professionals in nursing and medicine in contact with new ideas and techniques, but these are poorly suited to auxiliaries, who have minimal formal education or income.

The magazine *Children in the Tropics*, published by The International Children's Centre, Paris, is used in training centers and some ministries in Africa but is rarely present in health centers. The contents of this well regarded magazine, available in both French and English, are appropriate for the training and education of personnel involved in work with children.⁵⁹

The periodical *Famille et Développement*, published in Sub-Sahara Africa, could play an interesting role in education of community health workers. This publication has been aimed at grassroots trainers and educators, but has also been welcomed by the general public, even those who are semi-literate. The magazine emphasizes self-help and publishes "do-it-yourself" articles on health and nutrition. It is finding its way into classrooms, also. In Togo, for example, trainee midwives used an article on clitorectomies in their classes.⁶⁰

The newsletter *SALUBRITAS* is an important source of new technical information to field workers involved in promoting primary health care.⁶¹ It is published in three languages. However, for the information in these publications to reach the front-line worker, it probably would take deliberate action on the part of the subscriber to share the information in a way that is understandable to those with little reading skills.

Frequency of In-service Training

Usually programs conduct continuing education through planned short-term courses or seminars, but their form varies widely throughout the world. Since the nature of an auxiliary's role, the length of initial training, program sources and population density differ from one health care program to another, it is not surprising that the frequency of refresher training varies. In Iran, the Luristan project held a refresher course for community health workers one day a month; otherwise, it was found that workers had a tendency to backslide.⁶² In China, barefoot doctors meet two days a month, as well as two weeks a year for continuing education.⁶³ In Liberia, a two-month refresher course for physician's assistants is given once a year.⁶⁴ In Narangwal, India, the auxiliary health workers meet once a week for a full day of continuing education.⁶⁵ Other programs use a variable schedule of in-service training, starting with frequent meetings and then tapering to less frequent ones.

In-service Curriculum

However the in-service training is scheduled, it usually covers three types of information. First, there should be a systematic review of the in-

formation and skills necessary to carry out the auxiliary's work in the areas of infectious disease control, environmental sanitation, family planning education, maternal and child health care, nutrition, preventive services and integrated community development. The training is related to existing task assignments and to changes in health needs and demands. Second, indispensable information on administrative policies and procedures should be presented and discussed. Third, the program of continuing education should be flexible enough to deal with specific problems, structural or interpersonal, that arise on the job. A balanced continuing educational program will not slight any of these emphases.

Funding

Adequate planning includes the allotment of sufficient funds to operate a strong program of in-service training, with qualified teachers, training facilities and supplies. The costs of transportation to the training area, food and lodging may be borne in part by the auxiliary, the community, or the government health services. Consideration has to be given also to paying the salary of the auxiliary during refresher courses. Some localities have used external donor assistance to pay for in-service education courses, but it is preferable that these are included in the program budget; otherwise continuing education may be seen as an extra and not as an integral part of administration and supervision.

SECTION VI--EVALUATION

Planning Criteria for Evaluation

Purpose

The health administrator must address two key questions in making a decision to evaluate an auxiliary program. The first is, "What use will be made of the evaluation?" and the second, "For whom is it intended?" The answers to these interrelated questions will determine the basic direction and ultimate acceptability of any evaluation.

The decision to assess a program may be a political one—a way to demonstrate success and secure funding, promote continuance of a program or, perhaps, justify the expansion of a smaller project. Evaluation may be undertaken because information is needed for management of a program—to improve services, to assess outcomes and acceptability—or for scientific reasons if the results of the project provide new knowledge or refine existing knowledge. Who are the data for? Does the program manager desire these data? Are they needed at a national level? Will the results change the behavior of a donor agency? Is the information for community committees or other health professionals? Is it for the auxiliary's own benefit?

Different types of information are collected for different purposes. If the purpose of the evaluation is political in nature, the achievements of the program will be stressed—the number and type of services provided, the benefits of the program for the people receiving services. Program managers will desire information about the level and nature of efforts, but may, in addition, wish to uncover possible program deficiencies. These results will be used internally to improve worker performance or program effectiveness. If scientific information is the goal, then the research design must be carefully selected so that results can be applicable to other settings. Furthermore, findings of the evaluation will be circulated far beyond the boundaries of the program, its administrators or even the nation.

Scope of Study

Objective appraisals are supposed to provide information closest to the "true" situation. However, the results of an evaluation can be extremely misleading. In carrying out a planned activity, an aim may be reached—but it may or may not be due to the planned activity. The auxiliary is but one

part of a whole structure. To evaluate only that one level and ignore the total context in which the auxiliary is working narrows the interpretation of the findings. Indeed, even the standards set for performance may not take into account the auxiliary's supply and distribution system or the resources of the country.

It is becoming increasingly recognized that there is seldom one cause for an event. Events are multifactored in origin. Not only are auxiliaries part of a particular health structure, they also are working in communities with a defined social ecology that can affect the health of the population. Furthermore, auxiliaries are working in an environment that is not static. Changes in living conditions and resources occur and these affect both the population and the workers. Because of such complexities, opinion is divided as to the value of studies that evaluate program input. Some people argue that it is the responsibility of the administrator to assess the results that are achieved. Others contend that one cannot really obtain definitive data. Clearly, a simple before-and-after research design cannot provide the entire answer as to the impact of a program; and a design calling for a control population may be difficult, if not unethical, to establish.

It may be possible to compare service coverage in different villages—for example, those using existing health services versus those receiving services from auxiliary community outreach workers. Or, it may be possible to compare the morbidity, mortality and fertility experiences of communities with and without primary health care workers. Demonstrations of improvements in health services or health status will be more credible if a comparison group study design is used. However, because comparison groups cannot be perfectly matched, it is never possible to control all possible intervening factors.

Flawed study design is but one of the technical problems related to scope of study. A large number of predictive variables may be required in order to account for the diversity of factors believed to influence health outcomes. The investigator will need a sample size large enough to permit the use of statistical procedures to describe and analyze interrelation of these variables on health outcomes. Depending upon the unit under investigation (e.g., number of persons, cases, visits) the time required to gather the necessary sample size may not meet expectations for use of the data.

The practicality of any evaluation scheme will vary according to the nature and purpose of the evaluation. For example, field studies using a comparison group study design require much time and money and are not practical for evaluation of the smaller community-based programs. On the other hand, government health services might wish to support this type of research in order to determine feasibility, efficiency and effectiveness of services before launching into wide-scale implementation of auxiliary based primary health care programs.

An evaluation effort that stretches over several years also raises the issue of the stability of research priorities. Any evaluation program requires the understanding and support of values and assumptions that underlie the research effort. Consensus on what research is important must extend over changes in practical or administrative personnel, shifts in policy or changing economic and political conditions in the community. The longer the time needed before any evaluation study is complete, the less likely that consensus can be maintained.

One of the biggest problems in assessing the impact of a program is the time scale. Benefits, or disadvantages, may show up long after an evaluation. Changes in behavior or people's habits may take a considerable time to occur. If evaluation is undertaken too early, it can destroy a program because not enough data are available to determine its effects on health. If performed too late, the people involved in the program may be so personally invested that it is all but impossible to obtain an accurate appraisal of the program.

Distinction should also be made between pre- and post-evaluation and continuous monitoring of programs. The purpose of developing a management information system is to improve decision-making, aid in allocating resources and increase accountability. The image is of an information system "monitoring" a program with rapid feedback at key points. The essence of pre- and post-evaluation design is of systematic information gathering that cannot be useful for several years.

Use of Study Results

Health professionals have come to regard evaluation as essential for determining productivity of workers and programs and for estimating the costs associated with particular service inputs and with individual patient and aggregate community outcomes. Reaction to evaluation is not always positive, however. Community residents may resent being the objects of study. Local health workers may distrust the motivations for evaluating performance. Others fear that emphasis on statistical measurement will direct program emphasis away from human values such as the quality of human relationships or personal growth. The fact is, unless a program can demonstrate that it is doing something positive for an individual's or a community's health, it will find itself out of funds and without support.

Both personal and social reasons inhibit the desire to learn of deficiencies in performance. Commenting on the need for objectivity in evaluation, Taylor said, "One of the more intractable obstacles to change is the innate human conviction that whatever one is used to doing is right. Normal human pride of involvement leads to an almost uncontrollable subjective bias."¹ There are also compelling social and political reasons to shy away from evaluation. Often one is afraid of being penalized if the investigators uncover problems. The more realistic this fear, the poorer will be cooperation and morale.

The chief expectation of evaluation studies is that the information will be used to better practices and increase accountability. The purpose and relevance of evaluation should be built into the original plan for the health program. The mechanism by which results of evaluation studies would be used to improve decision-making or reallocate resources should be specified in the initial health planning process. If the evaluation is done at the central or regional level, the local health administrator must be aware of the purpose of the evaluation and be prepared to act upon the results. The administrator can secure the cooperation of the health team for the evaluation effort by being open about the objectives, by actively involving the team, and by remaining firmly committed to the study throughout the time it takes to complete. In particular, the auxiliaries should understand the purpose and how they might benefit from the results of the evaluation.

Not only does some thought need to be given in advance to ways of translating study results into increased worker morale and performance, but also to methods for using these data to raise the community's level of awareness about its health status. The information that is obtained should assist a community in becoming more knowledgeable about identifying services a health program should provide. If the study focuses on matters such as quality of housing, breast-feeding practices, or water supply quality, rather than hospital or clinic visits, it is possible for community members to judge the effects of the health program on their community. Concentrating on services to patients serves to enhance the mystery surrounding medical care. Community members need to think in terms of health status outcomes they can influence and assess.

External versus Internal Assessment

Once the decision is made to evaluate a program, the next step is to determine who will carry out the study. Depending on the purposes of the evaluation and the resources of the program, the assessment may be carried out by an independent team or by research staff employed on the project. Perhaps both approaches may be employed, since they offer different perspectives. If there are powerful political reasons why information about program shortcomings would be unfairly damaging to individuals, then the wisest strategy might be self-evaluation, where the health team and support staff are brought together in a group process of problem identification and solution.

An individual program "represents a programmatic response to a particular perception of the problem, tempered by a priority ordering of a series of values, assumptions, stimuli and constraints." Local research staff may be seen as more impartial and objective, lending credibility to findings of the research effort.

Criticism has also been raised of outside, academically oriented investigators. Sometimes they have come with preconceived ideas that do

not match village realities. They may have little understanding of local conditions and little knowledge of local language usage. It may take time for them just to adjust to village life, if they do remain in the village. Frequently they have visited the village community, but then left for the city to design the study. If outside investigators are to be used, it is important that much planning be given to how these people are to work with representatives of the local health services and community residents.

Pre- and post-evaluation studies are usually carried out by research staff while program monitoring relies more on assessments by supervisors. The perspectives and tools by which an auxiliary might help his community constructively evaluate the health system need to be developed. Unfortunately, there are few examples of this. More experimentation should be done in this area.

Evaluation by Objectives

It is necessary to define objectives, in measurable terms, before starting the activity to be evaluated. A most useful guide in this process is Mager's "Preparing Instructional Objectives."³ Although its focus is on instructional objectives the process is the same for defining operational objectives of a program. As Kark has stated, evaluation of a health program requires a clear statement of the purpose and general objectives of the program along with details of specific measurable objectives in order to be able to ascertain whether these objectives have been achieved.⁴ In fact, the objectives for training and utilization of auxiliaries are defined during the planning phase of program development. Evaluation is an additional reason why programs should be planned jointly by health professionals and representatives of the community. People may need help to specify measurable objectives and develop the tools for evaluation, but if they are involved in that initial process, the results will mean a great deal more to them.

The steps in evaluation are first to define the objectives; then establish baseline criteria; proceed to monitor an ongoing program; and finally, conduct a post-evaluation, including appraisal and strategies for implementing program modification. This process should be as simple as possible, and focused only on the information that is most vital. Overly ambitious evaluation plans may flounder in the volume of data collected or the data collected may be too costly to analyze or be too general to be practical. It is better to answer one question well than to try to evaluate all things for all people.

Evaluating Multiple Objectives

How can one handle the evaluation of many different program objectives? Not all services need to be considered simultaneously. One strategy is to change indicators of program success from time to time. For example, first one could evaluate program effectiveness in child care, then family

planning, and next village sanitation. The total evaluation plan could stretch over a five-year period, with interim measures of different indicators.

Indeed, there are *different information needs over time*. Certain information is required early in the program, other information may be needed at a later time. For example, it is important initially to determine whether auxiliaries are performing the tasks they were taught. Later, it is more important to assess the basic health services coverage of a population or numbers of insect-breeding areas that have been eliminated. The health manager will have to anticipate information needs over time and try to determine which data are most feasible for use early in the program and which will be required over the long run. Many times evaluation efforts lose the support of the program's staff because initial concerns fade in intensity over time and are replaced by new interests. If the evaluation effort is not flexible enough to reflect changing research interests, the study ends up collecting data that are only of historical interest or for the record. Scheduling different measures over time can ameliorate, although not entirely resolve, this problem.

There is also no justification for the overall assessment of a program to be based on the results of a single evaluation. Programs change over time and often quite slowly. It is important to know the *trend of movement*; is the program progressing toward its goals? The emphasis should be on direction over time instead of on the achievement of a desired goal at one point in time. One method of assessing direction is to take repeated surveys on small community samples, such as a ten percent sample, several times a year. The investigator can check on such conditions as screens on windows, presence of cattle in the house, or number of vegetable gardens. These are simple questions that can be answered by a "yes" or "no," and can be carried out by auxiliaries or community residents.

Evaluating Adequacy and Competence of the Worker

Although each program will set unique objectives and priorities for investigation, there are some items of information about training and utilization of health auxiliaries that can be part of any general evaluation design. Evaluation may include an appraisal of: (1) the extent to which the auxiliary is meeting objectives of the program by measuring the worker's knowledge, performance and attitudes; (2) acceptability of the worker to patients, community residents and other members of the health team; (3) job satisfaction of the auxiliary; (4) coverage of the target population; (5) effectiveness of the program in terms of health status outcomes for patients or changes in the mortality and morbidity rates of the general population; (6) alteration in the health habits of the community; and (7) cost effectiveness of the program. These data topics will be discussed in turn, first describing evaluation related mainly to the auxiliary, then to the program of services.

Evaluation of Worker's Knowledge, Performance and Attitudes

Basic information needed to do the job

A basic item of baseline data is an appraisal of the auxiliaries' knowledge of the tasks they were trained to perform. Did the training program prepare them adequately for their jobs? Some administrators take for granted that auxiliaries have a basic level of information if they have graduated from a formal training program. In some localities this assumption may be true; in others, great variation can be found in the levels of auxiliary knowledge, attitudes and performance due to differences in recruitment, selection and instructional practices. Some programs have a definite period of probation so that assessment may be made of the performance, capabilities and character of the auxiliaries before permanent employment. Some programs require regular evidence of their comprehension. In one Guatemalan program, for example, there are monthly exams that must be passed in order for health workers to continue to have the privilege of buying medicine from the medicine cooperative.⁵

Simple written tests can indicate the extent to which auxiliaries understand and remember what they were taught. People, however, vary in their ability to express themselves in written form. An oral exam may be better and may yield more information about attitudes in the process. For example, the investigator can select the one or two major diseases in the area that were covered in the curriculum and comprise a major component of the auxiliary's job, and ask pertinent questions about management. How is diarrhea treated in a young child? When is supplemental feeding added for an infant who is breast-feeding? What tasks must be performed right after a baby's birth? The investigator can then follow up this probing of the auxiliary's factual knowledge by questioning community residents about the auxiliary's activities. What did the worker do for your child's diarrhea? What did the worker say about adding food to your baby's diet?

Task competence

Just as it is important to establish whether the auxiliaries understand and remember what they were taught, it is equally important to determine whether they can adequately perform the required tasks. In the United States, performance measures have been used extensively in nurse practitioner and physician's assistant training programs to assess the student's ability to carry out certain psychomotor skills, record findings and develop management plans for the patient. A good example of the use of this evaluation technique in Guatemala is the work of Jean-Pierre Habicht and his colleagues at the Institute of Nutrition of Central America and Panama. They have measured the effectiveness of their training program by scoring the performance of auxiliaries on the basis of their recording of physical findings, accuracy of diagnosis and appropriateness of treatment offered.⁶

In the field, *observations* of the auxiliary's performance can be made by either the supervisor or an independent assessment team. Subjective bias can be minimized if the field observer uses standing orders or a flow chart to evaluate the patient care activities. In East Africa, check lists with "yes" and "no" answers for predetermined tasks were used to compare the performances of health attendants with that of senior medical consultants who had seen the same patients.⁷

The evaluator may also wish to audit a random *sample of patient charts* for completeness of information and appropriateness of therapeutic action. Another approach is to specify certain high-risk cases, such as pregnant women who may be at risk because of age or parity, and examine only the charts of those patients to see if proper treatment, referral and follow-up occurred.

To date, the evaluation of health promotional activities is less well developed than that of medical or nursing curative tasks. The supervisor may observe auxiliaries with patients, but is less likely to see them at community tasks such as initiating the construction of latrines, building animal enclosures, or promoting the use of locally grown produce. Yet it is these very activities that should be encouraged. The program managers can stress home visits and preventive services by setting up a supervisory schedule that includes observation of auxiliaries in the community as well as the health posts.

Attitudes and beliefs of the workers

Evaluating a worker's knowledge and skills is part of the total picture. There is a great need to ascertain the auxiliary's beliefs, attitudes and values. Unfortunately, we are still a long way from understanding the relationship between attitudes and behavior, and between attitudinal change and behavioral change.⁸ There are many difficulties in trying to measure the way an auxiliary perceives people and the work situation. Depending upon the circumstances, the auxiliary may express quite different attitudes on the same subject. Certainly, what health workers say will be determined in part by what they consider proper and what they believe the teacher, supervisor or other investigator wishes to hear. There is merit, however, in establishing what the workers believe to be normative behavior.

Questionnaires may be used to assess attitudes. For example, there may be open-ended or forced-choice questions about the reasons why village streets are unclean, why patients do not comply with treatment plans, or why people desire large families. Another type of attitude questionnaire is to ask how the auxiliary feels about community participation in health care, the supervisor's assistance, or the use of contraceptives by young married couples. Responses are then distributed on a Likert-type scale, from highly favorable and approving to highly unfavorable and disapproving. The investigator must be cautious, however, since these

scales usually lack validation for different cultural and programmatic contexts.

Worker attitudes can also be assessed by less highly-structured *interviews*, but this method is likely to have considerable bias. Each auxiliary may not be asked the same questions. Ratings may be based on the investigator's response to the personality of the auxiliary, even though this response may be highly subjective. In either the structured or unstructured situation, the worker may be reluctant to express personal views for fear of being penalized.

Logs and diaries are another method of evaluating attitudes. These can be quite rich in detail and explicit about strains and satisfactions in the auxiliary's life; however, their interpretation is more subject to investigator's bias. Logs and diaries, like questionnaires, require the auxiliary to be skillful in the written language.

Role-playing is a teaching technique for training programs that can also be adapted for assessing worker attitudes. Health workers can be presented with hypothetical situations to enact, such as counseling a teenager about alcohol, or encouraging the removal of animal feces from a village market. However, people vary in their confidence and ability to dramatize a situation. If the technique is used, the auxiliaries should be presented with a situation commonly encountered in practice and one that permits a moderate range of responses. It should tap the person's beliefs, attitudes and values, as well as knowledge and skill.

In addition to the judgments made by the supervisor or other health professionals, the auxiliary may be asked for a *self-appraisal* of such personal characteristics as courtesy, motivation, and ability to get along with people. Performance on each quality may be ranked on a scale from inadequate to outstanding. The supervisor and auxiliary then review the assessment together.

The various techniques for evaluating attitudes—questionnaires, role-playing, self-appraisal—are limited. In order to get a comprehensive realistic picture of the health worker's behavior with patients and community residents, the supervisor needs to have frequent contact with the worker.

Acceptability of the Health Worker

Patient and community satisfaction

Supervisors and other evaluators should supplement their observation of the auxiliary's performance by interviewing the people for whom services are provided. How does the auxiliary greet people on a home visit? How does the auxiliary talk to children or old people? How does the auxiliary respond to a person with a problem? Can the auxiliary be depended upon to visit when promised? Supervisors should also ask patients if they were satisfied with the specific care or advice given by the worker. If the situation involved a referral, how did the patient feel about

being referred? Did the patient trust the auxiliary less because of the referral?

Persons who have not used services should also be asked about their knowledge of and attitudes toward the auxiliary. Do they know there is a village health worker? Why do they think some people go to see this worker? Do they think the auxiliary could help them if they had stomach pains or a headache, or if their baby were sick, or a family member had an accident? Would they talk to the health worker about the number of children they want? Do they think the auxiliary knows about good medicine, or about why people get sick? Did the auxiliary ever ask them what they thought were village health problems?

Most acceptance studies in the developed nations find that consumers approve of the medical and nursing care they receive. There are a number of possible reasons for this, among them being that services may actually be more acceptable to lay persons than to professionals who set a different standard of performance. Also, sick and suffering people may not be critical of any reassurance and help they receive. Certain circumstances—such as the experience of giving birth or the relief of knowing what the problem is—may dull any criticism. Studies in developing countries also show that consumers are satisfied with the services provided. However, the majority of the population does not use services for many reasons, including access (financial and distance), traditional beliefs, political views or personal dislikes. It is important to ask both those who use and those who do not use services how acceptable auxiliaries are to them under a variety of conditions.

Acceptance by other members of the health team

The health team and other co-workers should be questioned as to whether they are satisfied with the performance of the auxiliaries. Do they consider the auxiliaries' referrals appropriate? Are they capable, dependable and pleasant co-workers? In countries where the medical community retains a traditional view of the delivery of health services, or the nursing profession feels a threat from the new level of health worker, acceptance may come slowly. Health professionals may continue to hold unfavorable views toward the idea of the use of auxiliaries, even though they may personally like the individual auxiliaries working in their locality.

Political acceptance of the health worker

A very real problem in some parts of the world is the acceptability of the health workers to the political authorities. This is particularly true if the job of the auxiliaries is not to assist physicians but to help the community. If the workers have been successful in increasing community awareness of health problems, in helping people develop tools to better their conditions, and in obtaining community participation in planning and evaluating health activities, they are bound to have embarrassed, of-

fended or angered some people. Changing the status quo is not a smooth process. If the auxiliaries are meeting the objectives of the program and are acceptable to the people, then they should have the backing and encouragement of supervisors and health administrators, despite political criticism. But supervisors and administrators are often part of the political structure themselves and may be quite subject to political pressures. They may be unwilling or unable to give the backing to the auxiliary that is needed. Disagreements with the goals and directions of a program cannot be worked out by the auxiliary or at the middle management level. Ultimately, political opposition is fought at the community level by residents who believe the health worker is providing the kinds of services they perceive the community needs.

Obviously, auxiliaries cannot be all things to all people. A great deal of their acceptability to the general population, health professionals and other co-workers, and to government authorities will be influenced by the success during the planning phase at securing widespread participation in the development of the auxiliary program. Also, the more distinct the role of the auxiliaries, the easier it will be to assess their performance and the acceptability of those actions.

Job Satisfaction of the Auxiliary

The workers should also find their job acceptable and feel rewards are adequate, whether in money, prestige, or recognition of their contribution to community well-being. The importance of a strong support system to worker morale has been discussed. The auxiliaries should feel they are treated fairly and with respect by supervisors and other team members. They should feel their job is secure and look forward to future health activities with anticipation and optimism.

Although attitudes are important, the health administrator should also investigate other indicators of employee satisfaction. Turnover is a good measure of job satisfaction. Auxiliaries can, of course, leave their jobs for reasons other than dissatisfaction. Their families may relocate to another area or they may be promoted or offered a better opportunity elsewhere. Still, it is important to review the rate of turnover, that is, the number of persons who have left the job as a proportion of those who have held the job. A program is not effective if workers repeatedly leave, requiring the training of more and more people to replace them.

Measures of Program Efficiency and Effectiveness

Activity Analysis

Job analysis is another method commonly used to measure the extent to which the auxiliary is meeting program objectives. The data pertain to the productivity of the worker and can be used in assessing the efficiency of health service investment. Job analysis consists of identifying the de-

sired or actual work content, based on information about the auxiliary's services, activities and tasks, in accordance with program objectives.⁹ This method is useful for monitoring a program or as part of a one-point-in-time assessment of auxiliary services.

The supervisor or program evaluator will need information on the auxiliary's performance of a series of tasks related to actual delivery of services. They may enumerate from activity logs the productivity of the worker in such activities as immunizing children or spraying homes with residual insecticides. If the worker is illiterate, another method must be used to monitor activities. In Kenya and Colombia, for example, colored coupons are used to record activities performed and medications given. A count of the coupons gives a picture of the auxiliary's work.

Not all activities are equally efficacious. Technical supervisory personnel may wish to use activity records to develop a profile of the auxiliary's preventive and curative work, distributed according to frequency and known efficacy of the activity. Also, community supervisors such as village health committees may review the auxiliary's community development activities in terms of achievements and appropriateness to the needs of the community.

Task Analysis

A health administrator may not depend on activity reports but may conduct a special task analysis to reveal whether there is a discrepancy between the tasks the auxiliaries are trained to do and the tasks they actually are performing. Observation is made during a sample period of workers on the job or patients as they are cared for by different health workers. Experience of other investigators has shown that observation should be continued for at least one week, as it takes time for the auxiliary to get used to being observed. There is also the sampling problem of assuring adequate representation of activities performed at different seasons of the year: e.g., during planting, harvesting, the wet season, dry season, etc. A functional task analysis will show the administrator the average percentage of time the auxiliary is engaged in functions such as curative care or community preventive care. Quite detailed analysis can then take place. For example, a ratio can be obtained of the time in direct service versus time spent in administration. If a functional analysis has been made of all members of the health team, it is then possible to obtain a ratio of number of preventive service contacts by the auxiliary compared to those of physicians.

Service Coverage

Utilization rates are an important part of information used in monitoring and in pre- and post-evaluation of health programs. One counts the number of patients seen at the clinic or the number of visits to patients at home and compares these to the total population in the service area. The

program administrator needs some measure of the coverage of the target population, since one of the major justifications for using auxiliaries is as extenders of the health care system. A measure of their effectiveness, therefore, would be the increase in population coverage for the various health care activities provided by the program.¹⁰

Visits per capita can be analyzed by length of interval (e.g., daily, monthly, yearly), type of service (e.g., growth monitoring, curative, educational), nature of problem (e.g., respiratory, fever, contaminated water supply), provider of service (e.g., midwife, medical attendant, health promoter), type of treatment (e.g., drugs, oral rehydration, installation of well covers), location of village (e.g., age, parity, socioeconomic status), or any comparison that makes sense in terms of assessing the objectives of the program. If these utilization data are compared at two or more points in time, the investigator must take into account seasonal distribution of illness and seasonal accessibility to services (e.g., impassable roads in the rainy season) when interpreting trends in service coverage.

Neither service statistics nor functional analysis will establish why a discrepancy exists between training and performance. A worker's productivity can be influenced by such diverse factors as size of the target population, illness patterns in the area, availability of information about auxiliary services, cultural acceptability of these services, availability of other sources of care, distance to the health center, dissatisfaction with the auxiliary's services, staff mix, willingness of other members of the team to delegate tasks, supervisory support, available resources, or the auxiliary's own job satisfaction. If the health administrator is interested in understanding the factors responsible for utilization of a particular auxiliary's services, the data needed will go beyond those available in a management information system. A special survey of the population will be required, with the analysis of these data controlling for key variables that may limit coverage.

Outcome of Care

Another measure of the effectiveness of an auxiliary program is to look at the outcomes of care. One approach is to determine the effect of auxiliary services on the people receiving them. For example, one may wish to compare birth weights of babies whose mothers received prenatal services from an auxiliary with those whose mothers did not have such care. Or, one may be interested in the contraceptive continuation rate of women counseled by the auxiliary versus those receiving counsel from other persons.

The program may also have an impact on the *mortality and morbidity rates* of the target population. To obtain these rates, data on both users and non-users of services are required. Vital statistics may yield some information, for example, on changes in the death rate for children under three years of age in the area or the number of deaths due to tetanus

neonatorum. Special pre- and post-surveys may be necessary to determine if there is a change in worm infestation in the population, the extent of anemia, or eye problems. It is equally important to evaluate the *effect* of the auxiliary on such *precursors of disease* as impure water supplies, inadequate drainage systems or inadequate immunization coverage.

The administrator may also wish to assess the auxiliary's effect on the *health behavior of the population*. Are more people using clinic services, wearing shoes, or boiling water, than before the program started? Has there been an increase in community participation on health committees or in volunteer activities? Has the presence of the auxiliary resulted in changes in the hygiene of the traditional birth attendant or village barber? Has the auxiliary affected the behavior of the local pharmacists?

As the examples suggest, outcome measurements call for either a before-and-after design, or preferably, a control (or comparison) population. Special research skills are required for outcome studies. Data collection and analytic strategy are much different than for process evaluation. Greater precision is required in the information obtained, and one must control for many more variables that may have significant impact upon patient and population outcomes.

Cost Analysis

A major element of every evaluation design should be the short- and long-term cost-effectiveness of auxiliaries. The use of paramedical personnel such as dispensary attendants or dressers, sanitary assistants or nursing auxiliaries is thought to be less costly than professional health manpower. Unfortunately, in many localities this assumption has not been documented, although it may be true. The health administrator will be able to determine the most efficient personnel for a given situation by conducting cost-effectiveness studies.

In developing cost estimates, the investigator should include both operating and capital costs. The initial "start-up" cost may include the construction of health posts, as well as furnishings, drugs and equipment. The cost of training auxiliaries is also included in the analysis. If job turnover is rapid, the program may be incurring large training costs, despite the fact that the outlay for training any one worker may be small. Direct and indirect operating costs include salaries, supervision, continuing education, supplies, maintenance of the health post, and vehicles or animals used in transportation.

The investigator should be certain to include all costs. Often, goods, services or funds come from outside sources. For example, in Tanzania, costs of training and supplies are borne by the government, while other costs are the responsibility of the village communities, which may seek outside funds. In Jamaica, for several years, community health aides in

rural areas were supervised by medical students who received no salary, only living accommodations. It is not unusual for programs to receive food supplements, or donations of cement or seeds for planting. Such items are part of the total cost even though funds for them do not come from the program.

Cost efficiency

An average cost per specific output or outcome measure may be calculated for a specified time period, by dividing the total fixed and variable costs by the total number of program outputs or outcomes. For example, data on cost and data from a functional analysis can be combined to obtain the cost per unit of service. If information has been obtained on the cost of services provided by other health professionals, then the evaluator can compare the cost per unit for service by the auxiliary to that of a health professional. Cost-efficiency comparisons are sensitive to utilization rates. To the extent that utilization is affected by distance, patterns of illness, etc., the average cost per unit of service will also be affected. When comparing the average cost of different service programs or different service providers, it is important that the utilization data be a representative sample of activities.

Cost-efficient services are not necessarily cost-effective. Part of the rationale for using auxiliaries to provide primary care services is that they can increase coverage to populations who because of distance, geography or income are underserved. It will probably cost more to provide an equity of services to these people. It is important that the evaluator estimate the cost per benefit to the service population.

Cost-effectiveness

A cost-effectiveness comparison was carried out by the Narangwal Population and Nutrition Studies. Cost-effective ratios were used to compare different experimental service groups that were composed of different mixes of health manpower, including village attendants, family health workers and their supervisors, public health nurses and physicians. Data on cost of service were obtained from a functional analysis, and combined with longitudinal data on vital statistics to obtain an estimate of cost per deaths averted and cost per births averted.¹¹ From longitudinal growth survey data it was possible to calculate the cost per additional centimeters of growth at age 36 months. Cost per illness averted was calculated using data from a longitudinal morbidity survey. Information gathered in a cross-sectional psychomotor development survey was used in calculating the cost per increased percentage point in psychomotor skills.

Most program evaluations do not involve such large population trials. However, the general principles can be used by any size program in as-

sessing services. The evaluator must determine the following ratio of additional costs to outputs gained:

$$\frac{\text{Cost of new service input} \\ \text{minus cost of traditional service input}}{\text{Units of new service output} \\ \text{minus units of traditional service output}}$$

The health administrator may wish to review literature on calculating marginal and average costs. Berman has applied this to an assessment of the efficiency and effectiveness of village health worker programs.¹²

Communicating Study Results

Finally, results of the analysis of the information should be communicated to the worker, the community, the teaching program and health system officials. If the auxiliaries must fill out forms but receive little response, they will become frustrated and the value of their activities will be lowered in their eyes. Inaccuracies and omissions in recording can result. The government may be reluctant to budget necessary funds without some evidence of the effectiveness of the program. Other health workers may be reluctant to support the program if they do not know its benefits. Without feedback, the training program is left to churn out the same kind of workers, despite what may be disparities between training goals and actual performance. Unless the health program is actually made accountable to the community, the people will continue to be passive recipients of whatever services are provided.

Not only is there no ethical justification for withholding the results of health surveys or acceptability studies, it is folly to ignore the potentially valuable reactions to the findings. Most programs do not lack data, they lack analysis of data. The opinions of community members and members of the health system who have had experience with the auxiliary program can make the interpretation of the data more intelligible. The dissemination of evaluation results should go beyond report writing. There should be meetings or open forums at which the results can be thoroughly reviewed. There is more to be gained than to be lost in soliciting criticism and suggestions. An informed public will make better decisions. The collective wisdom of the community will help the health administrator and planner to mold auxiliary services into a practical program that will improve and maintain the health of the people.

NOTES AND REFERENCES

SECTION I—INTRODUCTION

1. Long, E.C. "Alternatives to Traditional Medical Training in Latin America." *Issues in International Education* No. 6, Institute of International Education. New York: Institute International Education, 1976.
2. Pitcairn, D.M. and Flahault, D., eds. *The Medical Assistant: An Intermediate Level of Health Care Personnel*. Public Health Papers, No. 60. Geneva: World Health Organization, 1974.
3. Fendall, N.R.E. *Auxiliaries in Health Care: Programs in Developing Countries*. Baltimore: Johns Hopkins Press, 1972.
4. Vaughan, J.P. "Are Doctors Always Necessary?: A Review of the Need for the Medical Assistant in Developing Countries." *Journal Tropical Medicine and Hygiene* 74:265-271, 1971.
5. WHO. *Training of Medical Assistant and Similar Personnel: 17th Report of the WHO Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel*. *WHO Technical Report Series* No. 385. Geneva: World Health Organization, 1968.
6. Fry, J. "Primary Medical Care in Africa: M.D. or M.A.?" *Journal College of General Practitioners* 21: 356-361, 1971.
7. Newell, K.W., ed. *Health By the People*. Geneva: World Health Organization, 1975.
8. Swift, R.C. *Mental Health: A Manual for Medical Assistants and Other Rural Health Workers*. Kenya: African Medical and Research Foundation, 1977.
9. Werner, D. *Where There is No Doctor, A Village Health Care Handbook*. The Hesperian Foundation, U.S.A. (Translated from Spanish), 1977.
10. Ministry of Health, India. *Manual for Community Health Workers*. Delhi: Government of India, 1977.
11. Ministry of Health, India. *Manual For Health Worker (Male)*, Vol. 1 and 2, 1977.
12. Ministry of Health, Indonesia. *Health Centre Reference Manual*, Vol. 1-4, 1976.
13. Biddulph, J. *Child Health for Health Extension Officers and Nurses In Papua New Guinea*. Papua New Guinea, 1976.

14. Balldin, B. et al. *Child Health, A Manual for Medical Assistants and Other Rural Health Workers*. Kenya: African Medical and Research Foundation, 1975.
15. Wyatt, G.B. and Wyatt, J.L. (with contributions from D.J. Halestrap and N.R.E. Fendall, consulting editors). *Medical Assistant's Manual: A Guide to Diagnosis and Treatment*. Singapore: McGraw-Hill International Book Co. 1973.
16. Eichenberger, R.W. *Manual de Auxilios para el Promotor de Salud (Manual for Auxiliaries)*. Centro Regional de Ayuda Tecnica, Agencia para el Desarrollo Internacional (AID), Mexico/Buenos Aires (published in Spanish by Publicidad Artistica Litografica, S.A., 1971).
17. Cox, H. *Midwifery Manual, A Guide for Auxiliary Midwives*. New York: McGraw-Hill, 1971.
18. Perales, A.; Walters, E. and Washington, J., eds. *Community Health Worker Program Manual*. Community Health Worker Project, West Valley Community College, Saratoga, California, 1974.
19. King, M.; King, F. and Martodipoero, S. *Primary Child Care: A Manual for Health Workers*. Oxford (U.K.); Oxford University Press 1978.
20. Bloem, K.; Joseph, S.; Wallace, N. and Wray, J., eds. *Appropriate Technology in Health in Developing Countries*, Proceedings of a conference sponsored by The National Council for International Health, Washington, D.C., Dec. 16-17, 1976 (offset typewritten report by NCIH).
21. Indian Council Medical Research and Indian Council Social Sciences Research. *Program Report of National Symposium on Alternative Approaches in Health Care Delivery Systems*, October 27-30, 1976.
22. Peng, J.Y.; Srisomang, K. and MacIntyre, R., eds. "Role of Traditional Birth Attendants in Family Planning." Proceedings of an international seminar held in Bangkok and Kuala Lumpur, July, 1974. IDRC-039e, Ottawa, Canada, 1974.
23. PAHO. *Medical Auxiliaries*. Publication of the Pan American Health Organization, 1973.
24. PAHO. *Seminar on Utilization of Auxiliaries and Community Leaders in Health Program in Rural Areas*. Final Report, Scientific Publication No. 296, Washington, D.C.: PAHO/WHO 1978.
25. UNICEF/SCARO. *Community Action-Family Nutrition Programs, Generation of Interrelated Activities*. Guidelines on Policies and Procedures, prepared by a Working Conference on International Union of Nutritional Sciences with UNICEF support at the National Institute of Nutrition, Hyderabad, India, October, 1977.

26. Morgan, R.E., Jr. Editorial: "The World Federation of Public Health Associations: A Growing Future in Developmental Cooperation." *Canadian Journal of Public Health* 69:185-187, May-June 1978.
27. PAHO WHO. IV Special Meeting of Ministers of Health of the Americas. Final Report and Background Document, Official Document No. 155. Washington, D.C.: PAHO WHO 1978.
28. WHO. *Primary Health Care: A joint report by The Director-General of the World Health Organization and the Executive Director of the United Nations Children's Fund for the International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978*. Geneva: WHO 1978.
29. United Nations. "Basic Services for Children in Developing Countries." Report by the Executive Director, United Nations Children's Fund. E/ICEF/L.1342 March 12, 1976.
30. Fendall, N.R.E. "Organization of Health Services in Emerging Countries." *The Lancet* 1:54-56, July 11, 1964.
31. Rogers, E.M. "Communication and Development: The Passing of the Dominant Paradigm," from *Communication and Development: Critical Perspectives*, edited by Rogers, E.M. Beverly Hill/London: Sage Publications, 1976.
32. Taylor, C.E. "The World's Poorest Billion." *In Brief*, Johns Hopkins University Magazine, Summer, 1977.
33. Hill, K.R. "Intermediate Technology in Medicine." *Contact* 8, April, 1972, pp. 168-172.
34. Harrington, M. *The Vast Majority*. New York: Simon and Schuster, 1977.
35. Grant, J.P. "The Changing World Order and the World's Poorest Billion," presented at the 25th Pugwash Conference, Madras, India, January 12-19, 1976.
36. Navarro, Vicente, M.D., Professor, Johns Hopkins University. Private communication, July, 1977.
37. McCord, C. "Medical Technology in Developing Countries: Useful, Useless, or Harmful?" Position paper for National Academy of Sciences Food and Nutrition Board Workshop on Effective Interventions to Reduce Infection in Malnourished Populations, June 13-16, 1977.
38. Wang, V.L. "Training of the Barefoot Doctor in the People's Republic of China: From Prevention to Curative Services." *International Journal of Health Services* 5(3): 475-488, 1975.
39. Saint, W.S. and Coward, F.W., Jr. "Agriculture and Behavioral Science: Emerging Orientations." *Science* 197:733-737, 1977.
40. New, P.K. and New, M.L. "The Links Between Health and the Political Structure of New China." *Human Organization* 34(3): 237-251, 1975.

41. Ronaghy, H. and Solter, S. "Is the Chinese Barefoot Doctor Exportable to Rural Iran?" *The Lancet* 1:1331-1333, June 29, 1974.
42. Navarro, V. "Report on Health Services in Cuba: Health, Health Services, and Health Planning in Cuba." *International Journal of Health Sciences* 2(3):397-432, 1972.
43. Wang, V.L., op. cit., same as note 31 above.
44. Pene, P. "Health Auxiliaries in Francophone Africa." *The Lancet* 1: 1047-1048, May 12, 1974.
45. King, M., ed. *Medical Care in Developing Countries*. Nairobi: Oxford University Press, 1966.
46. Martin, J.F. "International Health Planning," *Tropical Doctor*, October, 1976, pp. 185-186.
47. Cohen, Helen D., R.N., Harvard University. Letter August 9, 1977.
48. Habicht, J.P. "Delivery of Primary Care by Medical Auxiliaries: Techniques of Use and Analysis of Benefits Achieved in Some Rural Villages in Guatemala: Working Group on Rural Medical Care." Paper presented to Regional Office of the World Health Organization, Guatemala City, Guatemala, 1973.
49. Bryant, J.H. Keynote address to International Health Conference Programme, April 25-27, 1973, Columbia University School of Public Health (unpublished).
50. Fendall, N.R.E. "Forerunners." *World Health Magazine* June, 1972, pp. 4-7.
51. Elliott, K. "Using Medical Auxiliaries: Some Ideas and Examples." *Contact 11*, October, 1972, pp. 1-20.
52. Dorozynski, A. *Doctors and Healers*. Ottawa: International Development Research Centre (IDRC), IDRC-043c, 1975.
53. Harrison, T.J. "Training for Village Health Aides in the Kotzebue Area of Alaska." *Public Health Reports* 78(6):461-469, 1963.
54. Deuschle, K.W. "Training and Use of Medical Auxiliaries in a Navajo Community." *Public Health Reports* 78(6):461-469, 1963.
55. Stead, E.A. "Conserving Cost by Talents: Providing Physicians New Assistants." *Journal American Medical Association* 198: 1108, 1966.
56. Silver, H.K.; Ford, L.C. and Stearly, S. "A Program to Increase Health Care for Children: The Pediatric Nurse Practitioner Program." *Pediatrics* 39:756, 1967.
57. Lewis, C. and Resnick, B. "Clinics and Progressive Ambulatory Care." *New England Journal of Medicine* 277:1236-1241, December, 1967.

58. Smith, R.A.; Bassett, G.R.; Markarian, C.A.; Vath, R.E.; Freeman, W.L. and Dunn, G.F. "A Strategy for Health Manpower: Reflections on an Experience Called MEDEX." *Journal American Medical Association* 217(10):1362-1367, September 6, 1971.
59. Challenor, B.; Schermerhorn, J.; Collins, J.; Hill, B.; Wornum, B. and Perlman, N. "An Educational Program for Allied Health Personnel." *American Journal Public Health* 62(2): 223-228, February, 1972.
60. Torry, E.F.; Smith, D. and Wise, H. "The Family Health Worker Revisited: A Five-year Follow-Up." *American Journal Public Health* 63(1): 72-74, January, 1973.
61. Moodie, A.S. and Rogers, G. "Baltimore Uses Inner City Aides in a Tuberculosis Control Program." *Public Health Reports* 85:955-963, 1978.
62. Warnecke, R.B.; Graham, S.; Mosher, W.; Montgomery, E. and Schotze, W.E. "Contact with Health Guides and Use of Health Services Among Blacks in Buffalo." *Public Health Reports* 90(3): 213-222, May-June, 1975.
63. Richter, R.W.; Bergen, B.; Alsop, P.; Bruun, B.; Kilcoyne, M.M. and Challenor, B. "The Community Health Worker: A Resource for Informal Health Care Delivery." *American Journal Public Health* 64(11), November, 1974.
64. Fell, J., Dr. "The Use of Community Health Workers in a Community Blood Pressure Program Located in Greenerve, N.C." Paper presented for Symposium on The Community Health Worker, Airlie House, Virginia, October, 1977.
65. Hart, Linda, R.N., Nurse Practitioners Program, Jamaica and HOPE. Private communication, 1978.
66. Wingert, W.A.; Grubbs, J.; Lenosky, E.F. and Friedman, D. "Effectiveness and Efficiency of Indigenous Health Aides in a Pediatric Outpatient Department." *American Journal Public Health* 65(8):849-857, August, 1975.
67. Morrow, R.C. "The Training of Health Assistants: Report of an Experience in South Texas." *Public Health Reports* 88(7):589-590, 1973.
68. Franey, S. "Community Health Worker Program (Family Health Counselor) Denver Department of Health and Hospital, Denver, Colorado." Paper presented at Symposium on The Community Health Worker, Airlie House, Virginia, October, 1977.
69. King, L.; Reynolds, A. and Young, Q. "Utilization of Former Military Corpsmen in the Provision of Jail Health Services." *American Journal Public Health* 67(8):730-734, 1977.

70. Somers, A.R. and Moore, F.M. "Homemaker Services—Essential Option for the Elderly." *Public Reports* 91(4):354-359, 1976.
71. Hoff, W. "Training the Disadvantaged as Home Health Aides." *Public Health Reports* 84:617-623, 1969.
72. Yen, Y.C.J. "The Ting Hsien Experiment." Pamphlet published by the Chinese National Association of the Mass Education Movement, Peiping, China, 1934.
73. Long, E.C. and Viau, A.D. "The Health Care Extension Using Medical Auxiliaries in Guatemala." *The Lancet* 2:127-130, 1974.
74. Behrhorst, C. "The Chimaltenango Development Project, Guatemala." *Contact* 19, February, 1974.
75. Laib, A.M. and Goriup, S. "Experiment in Algeria." *World Health Magazine*, June, 1972, pp. 16-20.
76. Jagdish, V. "Reorganization of Health Auxiliaries in India." *Tropical Doctor* (accepted for publication 1978).
77. Shah, P.M. "Health and Nutrition Care at Grass-roots Level Through Community Development: Education of Agents for Health Care at the Palghar and Kasa Project." *Indian Journal of Medical Education* XV(2), July-December, 1976(India).
78. McCord, C. "The Companiganj Rural Health Project: A Joint Venture Between Government and Voluntary Agencies." *Contact* 34, August, 1976.
79. Brodt, W. "Implications for Training Curriculums From a Task Inventory Survey of Indian Community Health Representatives." *Public Health Reports* 90(6):557-560, 1975.
80. Paradis, R. "Case Study of Health Services Delivery in Cameroon." Paper presented at Johns Hopkins University School of Hygiene and Public Health, March 2, 1977.
81. Andreano, R.; Cole-King, S.; Katz, F. and Rifka, G. "Assignment Report Evaluation of Primary Health Care Projects in Iran, June, 1976." WHO Report, Regional Office for Eastern Mediterranean EM/RH/33, June, 1976.
82. Ronaghy, H.A. and Solter, S.L. "The Auxiliary Health Worker in Iran." *The Lancet*, August, 1973, pp. 427-429.
83. Fountain, D.E. "Programme of Rural Public Health: Vanga Hospital, Republic of Zaire." *Contact* 13, February, 1973.
84. Bedaya-Ngaro, S. "The Central African Republic: Preparing the Future." *World Health Magazine*, June, 1972, pp. 26-27.
85. Reese, M.C. "Meeting Maternal and Child Health Needs in Tanzania." *International Nursing Review*, Jan. - Feb. 1978, p. 10.
86. Gish, O. "Doctor Auxiliaries in Tanzania." *The Lancet* 2:1251-1254, December, 1973.

87. Were, M.K. "Community Based Health Care: A National Pilot Project in Western Kenya." Pamphlet published with assistance from UNICEF in Nairobi, Kenya, 1978.
88. Papua, New Guinea. "Medical and Health Services in Papua, New Guinea.: File No. 53-3-10, Department of Public Health, Konedobu, Papua, New Guinea, 27 March 1972.
89. Waldeyes, A. Manpower Training in the Field of Health in Ethiopia." *Ethiopian Medical Journal* 13:101-110, 1975.
90. Ministry of Health Thailand. Lampang Health Development Project, a Thai Primary Health Care Approach, conducted by the Ministry of Public Health, Royal Thai Government, with assistance of American Public Health Association, University of Hawaii and US/AID, printed in Thailand, 1978.
91. Vidal, E.L.V. "Venezuelan Exposition About the Simplified Medicine Program in Venezuela, 1976." Mimeographed report to Ministerio de Sandidad Y Asistencia Social, 1976.
92. OXFAM Project, Rur 1 Health Project, Zonkwa, North Nigeria, 1977.
93. Gallardo, L.D. "Rural Community Action and Health Program." Report prepared as APHA's consultant and published by the American Public Health Association under US/AIDta-BOA-1070 Grant, 1976.
94. Fournier, G. and Djermakoye, I.A. Village health team in Niger (Maradi Department), in *Health By the People*, Newell, ed. Geneva: World Health Organization, 1975.
95. El Abdein, El Fatih Zein and Saeed, Abdalla A. Wahid. Report of the African Conference on Training, Utilization, Supervision and Support of Frontline Health Care Workers, Sudanese Society for Preventive and Social Medicine, April 1979.
96. Nepal: Operations Manual— Village Health Worker (Junior Auxiliary Health Worker). Prepared by Training Cell, Community Health and Integration of Health Service Division, Department of Health Services, Katmandu, Nepal, January, 1975.
97. Ariyaratne, A.T. "Community Research and Health," in *Interactions of Health and Development*. Washington (D.C.): National Council for International Health, 1977.
98. Rifkin, S.B. *Community Health in Asia: A Report on Two Workshops*. Singapore: Christian Conference of Asia, 1977.
99. William C. "Paramedical Workers in Africa." Lecture (audio-video taped) at Johns Hopkins University, School of Hygiene and Public Health, December 2, 1971.
100. Roemer, A. "The Role of Allied Health Manpower in Developing and Socialist Countries," (article to be published 1978).

101. WHO. "What's in a Name?" *World Health Magazine*, June, 1972.
102. Fendall, N.R.E., op. cit., same as note 3 above.
103. Baker, T. "Paramedical Paradoxes— Challenge and Opportunity," in *CIBA Foundation Symposium on Teamwork for World Health*, Home, G.W. and O'Conner, M., eds. London: J.A. Churchill, 1971.
104. Davis, R. "Geographical Coverage and the Role of Voluntary Collaborators in Malaria Case Detection." *Malaria Journal* (Bangkok), Sept.-Oct., 1974, pp. 1-10.
105. Suyadi, A.; Sadjimin, T. and Rohde, J.E. "Primary Care in the Village: An Approach to Village Self-Help Health Programs." *Tropical Doctor* 7:123-128, 1977.
106. Brooke, D.E. "The Role of the Medical Assistant: Community Health Care." *Tropical Doctors* 4:174-176, 1973.
107. Verderese, M.L. *The Traditional Birth Attendant in Maternal and Child Health and Family Planning: A Guide for Her Training and Utilization*. Geneva: World Health Organization, 1974.
108. Rogers, E.M. and Solomon, D.S. "Traditional Midwives and Family Planning in Asia." *Studies in Family Planning* 6(5): 126-133, May, 1975.
109. Peng, J.Y.; Laily, B.; Baker, N. and Marxuki, A.B. "Village Midwives in Malaysia." *Studies in Family Planning* 3(2):25-28, February, 1972.
110. Mangay-Angara, A. "New Status for the Hilot." *World Health Magazine*, November, 1977.
111. Elliott, K., op. cit. note 51 above.
112. Berman, P.A. "Village Health Workers in Developing Countries: Evidence of Effectiveness and Efficiency." Thesis presented to the faculty of the graduate school of Cornell University, August 1979.
113. IDRC. Low Cost Rural Health Care and Health Manpower Training, Box 8500, Ottawa, Canada.
114. Gish, O., ed. *Health, Manpower and the Medical Auxiliary*. Intermediate Technology Development Group, London, E., 1971.
115. Elliott, K., op. cit. notes 51 and 111 above.
116. CONTACT address: Christian Medical Commission, World Council of Churches, 150 Route de Ferney, Geneva, Switzerland.
117. WHO address: World Health Organization, Avenue Appia, 1221 Geneva, Switzerland.
118. "El Informador" (address): Comité Regional de Promoción de Salud Rural y Asociación de Servicios Comunitarios de Salud (ASECSA), Apartado Postal No. 27, Chimaltenango, Guatemala, C.A.

119. *SALUBRITAS* a newsletter published by the International Health Programs of the American Public Health Association and the World Federation of Public Health Associations. Address: American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C. 20005.

SECTION II—PROGRAM DESIGN: BUILDING THE SUPPORT SYSTEM

1. Gish, G. *Guidelines for Health Planners*. London: Tri-Med Books, Ltd., 1978.
2. Reinke, W.A., ed. *Health Planning: Qualitative Aspects and Quantitative Techniques*. Baltimore: Johns Hopkins University, School of Hygiene and Public Health, 1972.
3. PAHO/WHO. *Health Manpower Planning: A Comparative Study in Four Countries, Volume 1*. Prepared by Pan American Health Organization, published by DHEW Publication NO. (HRA) 78-94, 1978.
4. Smith, R.A., ed. *Manpower and Primary Health Care: Guidelines for Improving/Expanding Health Service Coverage in Developing Countries*. Hawaii: The University Press of Hawaii, 1978.
5. Strachan, D. "Marketing of an Unpopular Idea in the Public Sector: Rural Health Technicians in Guatemala." INCAE Public Management, May, 1976.
6. Vaughan, J.P. "Are Doctors Always Necessary?" A review of the need for the medical assistant in developing countries." *Journal Tropical Medicine and Hygiene* 74:265-271, 1971.
7. Wray, Joe, D., M.D., Harvard University. Personal communication, August 9, 1977.
8. Garza, S. and Beltran, O. "Problems of Auxiliary Health Workers in Latin America." Paper prepared for presentation at the II Meeting of the Health Sciences Education Information Center, December 10-11, 1970, Washington, D.C. (unpublished document of PAHO).
9. Idress, A.A.; Lolik, P.; Khan, R.A. and Benyoussef, A. "The Primary Health Care Programme in Sudan." *WHO Chronicle* 30:370-374, 1976.
10. Hesperian Foundation (Palo Alto, Calif.) "Project Piaxtla. Village Run Care Network in Mountains of Western Mexico." Newsletter from the Sierra Madre #13, February, 1979.
11. Moscovice, I. "The Viability of Mid-Level Practitioners in Isolated Rural Communities." *Public Health Briefs* 69(5):503-505, May, 1970.

12. Round the World (editorial): The Lancet. "Lesotho: Proposed New Hospital in Maseru (Africa)." *The Lancet* March 4, 1978, pp. 492-493.
13. Zschock, D.K. *Health Care Financing in Developing Countries*, American Public Health Association International Health Programs Monograph No. 1. Washington, D.C.: American Public Health Association, 1979.
14. Cunningham, N. "The Under-Fives Clinic-- What Difference Does It Make?" Doctoral dissertation, Johns Hopkins University, Baltimore, Maryland, 1976.
15. Morley, D. *Pediatric Priorities in the Developing World*. London: Butterworths, Ltd., 1973.
16. Taylor, C.E.; Kielmann, A. and De Sweemer, C. "Narangwal Experiment on Interaction of Nutrition and Infection." *Indian Journal Medical Research* 68:1-20, 1978.
17. Arole, R.S. "Comprehensive Rural Health Project, Jamkhed (India)." Prepared for National Symposium on Alternative Approaches in Health Care Delivery Systems, October 27-30, 1976, Hyderabad, India.
18. Habicht, J.P. "Delivery of Primary Care by Medical Auxiliaries: Techniques of Use and Analysis of Benefits Achieved in Guatemala." *Medical Auxiliaries*, Scientific Publication No. 278, pp. 24-57, Washington, D.C.: Pan American Health Organization, 1973.
19. McCord, C. "Medical Technology in Developing Countries: Useful, Useless or Harmful?" *American Journal Clinical Nutrition* 31: December, 1978.
20. McCord, C. Same as note 19 above.
21. Ronaghy, H.A. "Kavar Village Health Worker Project." *Tropical Pediatrics and Environmental Child Health*, February, 1978, Monograph No. 52.
22. Falk, L.A. "The Rural Cooperative Health Services System in China." *APHA Newsreport* No. 3, August, 1978, pp. 3-4.
23. Berman, P.A. "Village Health Workers in Developing Countries: Evidence of Effectiveness and Efficiency." A thesis presented to the Faculty of the Graduate School of Cornell University, August, 1979.
24. Falk, L.A., op. cit., same as note 22 above.
25. Russell, C.H. "Auxiliary Personnel in Health Delivery Systems: Case Study." Paper prepared for 18th Session, Senior Seminar in Foreign Policy, Department of State, 1976.
26. Navarro, V. "Report on Health Services in Cuba: Health, Health Services, and Health Planning in Cuba." *International Journal of Health Services* 2(3):397-432, 1972.

27. Winans, E.V. and Haugerud, A. "Rural Self-Help in Kenya: The Harambee Movement." *Human Organization* 36(4):334-351, Winter, 1977.
28. Russell, C.H., op. cit., same as note 25 above.
29. New, P.K. and New, M.L. "The Links Between Health and the Political Structure of New China." *Human Organization* 34(3):237-251, 1975.
30. Ugalde, A. "Health Decision Making in Developing Nations: A Comparative Analysis of Colombia and Iran." *Social Sciences and Medicine* 12:1-7, 1978.
31. Black, M. "Deciding in the Daylight: Community Care in Western Kenya." *UNICEF News* 98:1-8, 1978.
32. Aarons, A. and Hawes, H. *Child-to-Child*. London: MacMillan Press, 1979.
33. Taylor, C.E. "Reorientation of Health Personnel to Meet the People's Needs." *Les carnets de l'enfance (Assignment Children)*, Governments and the People's Health International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September, 1978. UNICEF 42:67-69, April/June 1978.
34. Bryant, J.H. Address: International Health Conference Programme, April 25-27, 1973, Columbia University, School of Public Health.
35. McCord, C., op. cit., same as note 19 above.
36. Johnston, M. "The Planning Dialogue in the Community." *Contact* 43, February, 1978.
37. Foster, S.O. "Participation of the Public in General Smallpox Eradication." *Public Health Reports* 93(2): 147-149, March/April, 1978.
38. Henderson, D.A., Dean, School of Hygiene and Public Health, Johns Hopkins University. Personal communication, 1978.
39. Barzgar, A. "The Health Services Development Research Project in Iran." WHO mimeographed report EM/RC25 Tech. Disc. 1 pages 7-27, 1977.
40. Barzgar, A. Lecture (audio-video taped) at Johns Hopkins University, School of Hygiene and Public Health, May 23, 1977.
41. Guier, J.G.O. "Promotion of Community Participation in the Rural Health 'Hospital Without Walls' Program in Costa Rica." Paper presented to the Second International Congress World Federation of Public Health and the 69th Conference of the Canadian Health Association, Halifax, Canada, May, 1978.
42. UNICEF. "A Strategy for Basic Services." (43 page unpublished paper) New York, 1978.
43. Bryant, J.H., op. cit., same as note 34 above.

44. Basch, P.F. *International Health*. New York: Oxford University Press, 1978.
45. Wood, C.H. III: *Availability of Health Manpower in Health Care in Remote Areas*. Kaiser Publications (undated).
46. Williams, C. "Paramedical Workers in Africa." Lecture (audio-video taped) at Johns Hopkins University School of Hygiene and Public Health, December 2, 1971.
47. Wood, C.H., op. cit., same as note 45 above.
48. Elliott, K. "Using Medical Auxiliaries: Some Ideas and Examples." *Contact 11*, October, 1972, pp. 1-20.

SECTION III—PROGRAM DESIGN: THE HEALTH PROGRAM

1. Hornby, P.; Mejia, A.; Ray, D. and Simeonov, L. "Trends in Planning for Health Manpower." *WHO Chronicle* 30:447-454, 1976.
2. Barclay, G.W. *Techniques of Population Analysis*. New York: John Wiley & Sons, Inc., 1958.
3. Rohde, J.E.; Ismail, D. and Sutrisno, R. "Mothers as Weight Watchers: The Road to Child Health in the Village." *Environmental Child Health*, December, 1975, pp. 295-297.
4. Morley, D. "Under-Five Clinic in Lagos, Nigeria, A." Lecture (audio-video taped) at Johns Hopkins University School of Hygiene and Public Health, May 10, 1971.
5. Foege, W.H. "Community Medicine." Lecture at the Conference of the Protestant Churches Medical Association, Nairobi, Kenya. (unpublished document of the Christian Medical Commission, World Council of Churches, CMC 70 17 (undated).
6. Shah, P.M. "Third Progress Report of the Kasa MCHN Project, Integrated Mother-Child Health-Nutrition Model, April, 1976 (published March 1977).
7. Department of International Health, Johns Hopkins University. *The Functional Analysis of Health Needs and Services*. Delhi (India): Asia Publishing House, 1976.
8. Shah, P.M.; Shrestha, M.P. and Campbell, M., eds. "Rural Health Needs: Report of a Seminar held at Pokhara, Nepal, 6-12 October, 1977." IDRC Publication 105e, Ottawa, Canada, 1978.
9. McCord, C. "Medical Technology in Developing Countries: Useful, Useless, or Harmful?" *American Journal Clinical Nutrition* 31: December, 1978.
10. McCord, C. and Kielmann, A. "Successful Program for Paraprofessionals Treating Childhood Diarrhea and Pneumonia." *Tropical Doctor* 8(4):220-225, 1978.
11. Alderman, M.; Husted, J.; Levy, B. and Searl, R. "A Young-Child Nutrition Programme in Rural Jamaica." *The Lancet*, May 26, 1973, pp. 1166-1169.
12. Scutehfield, F.D. "Alternative Methods for Health Priority Assessment." *Journal of Community Health* 1(1):29-38, Fall, 1975.

13. Blumhagen, R.V. and Blumhagen, J. *Family Health Care: A Rural Health Care Delivery Scheme*. Final report with summary of experiences and recommendations for the Health Care Delivery System, published by MAP (Medical Assistance Programs, Inc.) Wheaton, Ill., 1974.
14. Barzgar, A. Lecture (audio-video taped) at Johns Hopkins University School of Hygiene and Public Health, May 23, 1977.
15. Barzgar, A. "The Health Services Development Research Project in Iran." WHO mimeographed report EM/RC25/Tech. Disc. 1, pp. 7-27, 1977.
16. King, M. "The Community Health Worker: Who should he be? What should he do? How should we educate and supervise him?" Paper prepared for Symposium on Community Health Worker, Airlie House, Virginia, Oct., 1977.
17. Andreano, R.; Cole-King, S.; Katz, F. and Rifka, G. "Assignment Report Evaluation of Primary Health Care Projects in Iran, June, 1976." WHO Report EM/RF/33, Regional Office for Eastern Mediterranean, June, 1976.
18. Arole, R.S. "Comprehensive Rural Health Project, Jamkhed, India." Paper prepared for National Symposium on Alternative Approaches in Health Care Delivery Systems, October, 1976, Hyderabad, India.
19. National Academy of Sciences, Washington, D.C. "A Committee Report: Review of the AID Health Strategy." Institute of Medicine Publication IOM-78-05, National Academy of Sciences, September, 1978.
20. Shah, P.M., op. cit., same as note 8 above.
21. Joseph, S.C. "The Community Health Worker in Developing Countries: Issue in Administrative Structure, Support and Supervision." Conference discussion preliminary to conference presented at Symposium on the Community Health Worker, Airlie House, Virginia, October, 1977.
22. Mwabulambo, D.J. "The Village Health Workers Scheme in Tanzania." Paper for Symposium on Community Health Worker, Airlie House, Virginia, October, 1977.
23. Garcia, J.S. "The Auxiliary Health Worker in Community Health (Philippines)." *Tropical Doctor* 8:90-94, 1978.
24. Kaul, S.A. "National Symposium on Alternative Approaches in Health Care Delivery Systems, Trial for Village Health Workers in Remote Area of Himachal Pradesh (India)." Indian Council of Medical Research and Indian Council of Social Sciences Research, Hyderabad, October, 1976.
25. Musk, C.D. "Who Helps the Doctor: The Medical Assistant in Zambia." *Update International*, March, 1974, pp. 197-200.

26. Dagbe, A. "Training of Auxiliary Personnel for Liberia's Rural Health." Report of Expert Committee on the Training and Utilization of Auxiliary Personnel for Rural Health Teams in Developing Countries. Unpublished WHO document HMD/HTD/EC/77.7, 1977.
27. Flahault, D. "The Case for Medical Assistants." *World Health Magazine*, June, 1972, pp. 8-15.
28. Sidel, V.W. "The Roles and Training of Health Workers in the People's Republic of China." Panel presentation on Human Resources Utilization: An International Comparison, sponsored by the New Professional Health Workers Section, Annual Meeting, APHA, Atlantic City, November, 1972.
29. Donnard, J.F. "Children of the Tropics." Edited by the International Children's Centre (Paris) with the participation of the Institut de Pediatrie Sociale, University of Dakar, National Institute of Public Health, Abidjan, 1977.
30. Kessler, S. and Helfenbein, S. "Training Community Health Workers: What We've Learned and Where Do We Go From Here?" Paper presented by authors from the Office of International Programs, APHA, 1978.

SECTION IV – RECRUITMENT, SELECTION AND TRAINING OF AUXILIARY HEALTH WORKERS

1. Wray, Joe, M.D., Harvard University. Personal communication, August 9, 1977.
2. Kessler, S. and Helfenbein, S. "Training Community Health Workers: What We've Learned and Where Do We Go From Here?" Paper presented by authors from the Office of International Programs, APHA, 1978 (to be published at later date).
3. Hendrata, L. and Wardoyo, Y. "Village Cadre System in Community Development Regency of Banjarnegara, Central Java." Paper presented at Symposium on Community Health Worker, Airlie House, Virginia, October, 1977.
4. King, M. "The Auxiliary— His Role and Training," *Journal of Tropical Medicine and Hygiene*. 1970, pp. 336-346.
5. Guilbert, J.J. *Educational Handbook for Health Personnel*. Geneva: World Health Organization, 1977.
6. Wakeford, R.E. "Teaching for Effective Learning: A Short Guide for Teachers of Health Auxiliaries." Reference materials for Health Auxiliaries Project—REMAHA, WHO, 1974.
7. WHO. "Training and Utilization of Auxiliary Personnel for Rural Health Teams in Developing Countries." Report of a WHO Expert Committee, Technical Report Series No. 633. Geneva: World Health Organization, 1979.
8. Segall, A.J.; Vanderschmidt, H.; Burglass, R. and Frostman, T. *Systematic Course Design for the Health Fields*. New York: John Wiley and Sons, Inc., 1975.
9. Vanderschmidt, L.; Massey, J.A.; Arias, J.; Duong, T.; Haddad, J.; Noche, L.K.; Kronfol, N.; Lo, E.K.C.; Rizyal, S.B.; Shrestha, M.P. and Yepes, F. "Competency-Based Training of Health Professions Teachers in Seven Developing Countries." *American Journal Public Health* 69(6): 585-590, June, 1979.
10. PROJECT CONCERN. Two volumes: *Instructor's Manual: Village Health Promoter Agent De Sante*; and *Trainee's Manual: Village Health Promoter Agent De Sante*. Published by Project Concern International, 3802 Houston Street, San Diego, California 92138, 1978.

11. MEDEX. "Training Health Workers in Emerging Nations: Adapting MEDEX in Other Nations." *Public Health Reports*, March-April, 1978.
12. Uberoi, I. et al. *Child Health Care in Rural Areas—A Manual for Auxiliary Nurse Midwives*: Rural Health Research Center, Narangwal, India, 1972. Delhi (India): Asia Publishing House, 1972.
13. *Teaching Aids at Low Cost*, Institute of Child Health, Guilford Street, London, WC1, U.K. (organization for production and distribution of Audio-Visual Aids Overseas).
14. *Appropriate Health Resources and Technologies Action Group*, 85 Marylebone High Street, London W1M 3DE (Address).
15. PAHO. "Extension of Health Service Coverage Based on the Strategies of Primary Care and Community Participation." Summary of the Situation in the Region of the Americas, Official Document No. 156. (Washington, D.C., Pan American Health Organization, 1978).
16. Taylor, C.E. "Commentaries: Economic Triage of the Poor and Population Control." *American Journal Public Health* 67(7):660-663, July, 1977.
17. Joseph, S. "Health Manpower for Rural Primary Care: Problems and Potentials in Relating Medical Education in Rural Area, as Illustrated by Recent Attempts in Wyoming and in Central Africa." *Public Health Report* 91(2):159-163, 1976.
18. Shah, P.M. and Shah, K.P. *Timely Health Care of Children and Mothers*. (Training Manual) Bombay: Popular Prakashan, publ., 1978.
19. Chell, D.A. "Nomadic Community Health Workers in the Sudan." Submitted for publication in SALUBRITAS, April, 1979.
20. Donnard, J.F. "Children of the Tropics," edited by the International Children's Centre (Paris) with the participation of the Institut de Pédatrie Sociale, University of Dakar, National Institute of Public Health, Abidjan, 1977.
21. Barnes, S. and Jenkins, C.D. "Changing Personal and Social Behavior: Experiences of Health Workers in a Tribal Society." *Social Science and Medicine* 6:1-15, 1972.
22. Canada. "Methods Manual for Community Health Workers: Medical Services." Published by the Department of National Health and Welfare, Canada, 1970.
23. Textor, R.B. and McCullough, J.C., assisted by Kanitayon, K. and Wasi, S. *Manual for the Rural Community Health Worker in Thailand*. Bangkok: Health Division, U.S. Operations Missions, 1958.

24. Fendall, N.R.E. in statement made at meeting of the Expert Committee on the Training and Utilization of Auxiliary Personnel for Rural Health Teams in Developing Countries, Geneva, 12-16 December, 1977.
25. Yates, A.S. "The Venezuelan Medicina Simplificada Program." *Public Health Reports* 90(3):247-253, May-June, 1975.
26. Field, J.O. "Development at the Grass Roots: The Organizational Imperative." Unpublished paper of John Osgood Field, The Nutrition, in the Bulletin, U.S. Dept. of Health, Education, and Welfare,
27. Zeighami, B.; Seighami, E.; Ronaghy, H. and Russell, S. "Acceptance of Auxiliary Health Workers in Rural Iran." *Public Health Reports* 92(3):280-284, May-June, 1977.
28. Ronaghy, H. and Solter, S. "Is the Chinese 'Barefoot Doctor' Exportable to Rural Iran?" *The Lancet* 1:1331-1333, June, 1974.
29. Bayoumi, A. "The Training and Activity of Village Midwives in the Sudan." *Tropical Doctor*, July, 1976, pp. 118-125.
30. Beeman, W.O. and Bhattacharyya, A.K. "Toward an Assessment of the Social Role of Rural Midwives and Its Implication for the Family Planning Program: An Iranian Case Study." *Human Organization* 37(3):295-300, Fall, 1978.
31. Bertera, R.L. and Ustonglu, N. "Training Village Midwives for Family Planning Services Delivery in Rural Turkey." *Pathpapers* No. 1, July, 1977.
32. Rosenfield, A. and Lincharoen, C. "Auxiliary Midwife Prescription or Oral Contraceptives." *American Journal Obstetrics and Gynecology* 114(17):942-949, December, 1972.
33. Zeighami, E.; Zeighami, B.; Eftekhari, A.E. and Khoshnevis, P. "Effectiveness of the Iranian Auxiliary Midwife in IUD Insertions." *Studies in Family Planning* 7(9):261-263, September, 1976.
34. Guneid, A.K.A., General Director of Health of Yemen, Ministry of Health, Yemen Arab Republic. Programme of Eleventh Scientific Conference, Sudanese Society of Preventive and Social Medicine, April 14-19, 1979, Khartoum.
35. Morton, J. "The Community Health Worker in the Norton Sough Region (Arctic Circle)." Paper prepared for Symposium on Community Health Worker, Airlie House, Virginia, October, 1977.
36. Nutting, P.; Tirador, D. and Pambrun, A. "An Approach to Utilizing Health Auxiliaries in Direct Patient Care." Accepted for publication, in the Bulletin, U.S. Dept. of Health, Education, and Welfare, Indian Health Service, Tucson, Arizona, April, 1977.
37. Nutting, P.; Shorr, G. and Berg, L. "Process and Outcome Measures of Tribal Health Workers in Direct Patient Care in Advanced Medical Systems: Issue and Challenge." Miami: Symposia Specialists, Medical Books, 1975.

38. WHO. "New Schools for Old." Discussion editorial with Dr. M.A.C. Dowling, Dr. J.J. Guilbert and Dr. F.M. Katz. *World Health Magazine*, April, 1977.
39. Taylor, C.E.; Carlson, D.G. and Golden, A.S. "Education of Primary Health Care Workers." UNICEF News Issue 100/1979/2, pp. 6013.

SECTION V – PROGRAM IMPLEMENTATION

1. De Sweemer, C. "Proposal for Program Development in Family Health and Population, West Africa." Mimeographed proposal to Dr. William K. Gamble, Ford Foundation, August 2, 1974.
2. Loomis, S.A. and Cox, K. Comparative Analysis of Health Manpower Issues in Latin American, Division of Program Analysis, Office of International Health, Department of Health, Education, and Welfare, 19 April 1973.
3. England, R. "Commentary: More Myths in International Health Planning." *American Journal of Public Health* 68(2):153-159, February, 1978.
4. Amsyari, F. and Katamsi, E. "The Status of Health Knowledge and Patterns of Seeking Health Advice in Rural East Java." *International Journal Health Education* XXI:34-40, 1978.
5. Loomis, S.A. and Cox, K., op. cit., same as note 2 above.
6. Torrey, E.F. "What Western Psychotherapists can learn from Witch-doctors." *American Journal Orthopsychiatry* 42(1):69-76, January, 1972.
7. Bourguignon, E. "Overviews: The Effectiveness of Religious Healing Movements: A Review of Recent Literature." *Transactions Psychiatric Research Review* 13:5-19, April, 1976.
8. Vahia, N.S.; Vinekar, S.L. and Doongaji, D.R. "Some Ancient Indian Concepts in the Treatment of Psychiatric Disorders." *British Journal Psychiatry* 112:1089-1096, 1966.
9. Lambu, T.A. *African Traditional Beliefs—Concepts of Health and Medical Practice*. Ibadan (Africa): Ibadan University Press, 1963.
10. Karlin, B. The State of the Art of Delivery of Low Cost Health Services in Less Developed Countries: A Summary Study of 180 Health Projects. APHA International Health Programs, Washington, D.C., 1977.
11. Study which reported on community involvement in health projects in nine countries (Joint UNICEF/WHO Report JC/UNICEF-WHO/77.2.1977).
12. *The Nation's Health* (APHA). Editorial: "Cuban Health Care: Polyclinic." June, 1976.

13. *The Nation's Health* (APHA). Editorial: "Bangladesh," by John H. Romani. January, 1979.
14. Isaacs, S.L. "Nonphysician Distribution of Contraception in Latin America and the Caribbean." *Family Planning Perspectives* 7(4):158-164 July/August, 1975.
15. Garner, J.S.; Mertaugh, M.T.; Michlin, M. and Duncan, G.W. "Village and Household Availability of Contraceptives: Africa/West Asia." Battelle Memorial Institute, Human Affairs Center, Seattle, Washington, 1976.
16. Gillespie, D.G. and Merritt, C.G. "Operations Research on Household and Village Contraceptive Distribution Systems," in *Village and Household Availability of Contraceptives: Africa/West Asia*, edited by Gardner, J. et al. Battelle Memorial Institute, Human Affairs Center, Seattle, Washington, 1976.
17. Saied, A. "Community Involvement in Health Services: The Panama Experiment." *International Journal Health Education* 17:17-23, 1974.
18. Maru, R.; Murthy, N. and Satia, J.K. "Multipurpose Worker Scheme— A Study of Pilot Implementation in Chhani Primary Health Centre." Population Project Unit: Indian Institute of Management, Ahmedabad, India, September, 1976.
19. Lolik, P.L.; Bhachu, S.S. and Anyudhi, R.: "The Primary Health Care Program in the Southern Region of Sudan." Paper prepared for Symposium of Community Health Workers, Airlie House, Virginia, October, 1977.
20. Werner, D. "Project Pixtla and the Hesperian Foundation," hand-printed by the Hesperian Foundation and Newsletter, January, 1977.
21. Fountain, D. "Programme of Rural Public Health: Vanga Hospital, Republic of Zaire." *Contact* 13, February, 1973.
22. Ariyaratne, A.T. *Sarvodaya: Development from the Village Up*. Pamphlet issued by Sarvodaya Educational Institute, Moratuwa, Sri Lanka, 1976.
23. Foster, G.M. Abstract: Section 12: "Community Mobilization," in *Ecological, Socioeconomic and Cultural Factors in Health*. The Institute of Medicine, Committee on International Health on Foreign Assistance in Health, 1978.
24. Banerji, D. "Health Behavior of Rural Population." *Economic and Political Weekly*. December, 1973.
25. Huenuman, F. "Change Comes to Casa de Piedra." *Pan American Health Magazine*, 9(3):4-7, 1977.
26. Fonaghy, H.; Najarzadeh, E.; Shewartz, T.A., Russell, C.S.; Solter, S. and Zeighami, B. "The Front Line Health Worker: Selection,

- Training and Performance." *American Journal Public Health* 66(3):273-277, March, 1976.
27. Banerji, D. "Social and Cultural Foundations of the Health Services System of India." *Inquiry*. Supplement to vol. XII, No. 2, June, 1975, pp. 70-85.
 28. Dwivedi, K.N. and Rai, P.H. "The Training of Traditional Birth Attendants: A Broader Approach is Needed." *International Journal Health Education* 14:29-33, 1971.
 29. Werner, D.B. "The Village Health Worker—Lackey or Liberator?" Paper prepared for International Hospital Federation Congress Sessions on Health Auxiliaries and the Health Team, Tokyo, Japan, May, 1977.
 30. Bryant, J.H. "Community Health Workers: The Interface Between Communities and Health Care Systems." *WHO Chronicle* 32:144-148, 1978.
 31. Pisharoti, K.A. "Training and Utilization of Auxiliary Personnel for Rural Health Teams in the Developing Countries with Special Emphasis on Management Problems." Report of Expert Committee on the Training and Utilization of Auxiliary Personnel for Rural Health Teams in Developing Countries, Geneva, 12-16 December, 1977 (WHO HMD/HTD/EC/77.8).
 32. Loomis, S.A. and Cox, K., op. cit., same as notes 2 and 5 above.
 33. Wood, C.H. "A Summary of the Current State of Community Health Workers in Kenya." Paper prepared for Symposium on Community Health Worker, Airlie House, Virginia, October, 1977.
 34. Harrison, T.J. "Training for Village Health Aides in the Kotzebue Area of Alaska." *Public Health Reports* 80 (7):565-572, 1965.
 35. Morton, J. "The Community Health Worker in the Norton Sound Region (Arctic Circle)." Paper prepared for Symposium on Community Health Worker, Airlie House, Virginia, October, 1977.
 36. Hendrata, L. and Wardoyo, Y. "Village Cadre System in Community Development Regency of Banjarnegara, Central Java." Paper prepared for Symposium on Community Health Worker, Airlie House, Virginia, October, 1977.
 37. Mertens, P. Revised WHO Technical Report Series: Information on the Physician Assistants' School: A Medium-Grade Medical Program, John F. Kennedy Medical Center, School of Physicians' Assistants.
 38. Yates, A.S. "The Venezuelan *Medicina Simplificada* Program." *Public Health Reports* 90(3):247-253, May-June, 1975.
 39. Fendall, N.R.E. *Auxiliaries in Health Care: Programs in Developing Countries*. Baltimore: Johns Hopkins Press, 1972.
 40. Symes, W.D. "Factors Affecting the Supply of Drugs to Medical

- Auxiliaries in Papua and New Guinea." *Australian Journal of Pharmacy* 51(612), December, 1970 (Supplement No. 94).
41. Nepal. "For the Development of Integrated Basic Health Services in the District of Bara, Narayani Zone, Nepal." Department of Health, Ministry of Health, His Majesty's Government of Nepal, (no date).
 42. Thorne, M.C., M.D., Associate Professor, Department of International Health, Johns Hopkins University, private communication, June, 1978.
 43. Neumann, A.K.; Sai, F.T.; Lourie, I.M. and Wurapa, F.K. "A New Trend in International Health Work: The Banfa Project (Ghana)." *IDR Focus*, 1973, pp. 11-15.
 44. Joseph, S.C. "The Community Health Worker in Developing Countries: Issue in Administrative Structure, Support and Supervision." Conference discussion preliminary to conference at Airlie House, Virginia, October, 1977.
 45. Summary Minutes of Problem Solving Committee Meeting Developing Pilot Districts—Cornwall County, Jamaica, Wednesday, May 2, 1979. (Willie Mae Clay, Training Consultant, Cornwall County Health, Recording Secretary.)
 46. Shah, P.M. "Third Progress Report of the Kasa MCHN Project, Integrated Mother-Child Health-Nutrition Model, April, 1976."
 47. Foege, W.H.; Hogan, R.C. and Newton, L.H. "Surveillance Projects for Selected Diseases." *International Journal of Epidemiology* 5(1):29-37, 1976.
 48. Cole-King, S.M. "Under-Fives Clinic in Malawi: The Development of a National Programme." *Environmental Child Health*, August, 1979, pp. 183-191.
 49. Nutting, P.A.; Tirador, D.F. and Pambrun, A.M. "An Approach to Utilizing Health Auxiliaries in Direct Patient Care." Accepted for publication in Bulletin, U.S. Department of Health, Education, and Welfare, Indian Health Service, Tucson, Arizona, April, 1977.
 50. Feiner, A. "Telecommunications in Support of Health Care," unpublished paper of Practical Concepts, Inc., Washington, D.C., May 18, 1977.
 51. Wood, A.M. "The Problem of Communications in Medical Practice in East Africa." *East African Medical Journal* 46(10):348-350, 1969.
 52. Evaluations of Two-Way Communications System for Interactions Between Professionals for Delivery of Social Services to Rural Populations, unpublished, undated paper by Practical Concepts, Inc., Washington, D.C.
 53. Baker, Timothy D., M.D., Professor, Department of International

- Health, Johns Hopkins University, personal communication, October, 1978.
54. Feiner, A., op. cit., same as note 50 above.
 55. Martin, R.; Parker, E. and Wallace, E. "Two-Way Radio in Rural Health Care: Guatemala and Nicaragua." Unpublished paper for Agency for International Development, Washington, D.C., 1977.
 56. Notes from Geneva Meeting of Expert Committee on the Training and Utilization of Auxiliary Personnel for Rural Health Teams in Developing Countries, 12-16 December, 1977, attended by author.
 57. Hall, T.L. *Health Manpower in Peru: A Case Study in Planning*. Baltimore: Johns Hopkins Press, 1969.
 58. Karlin, B., op. cit. same as note 10 above.
 59. *Children in the Tropics*. Journal edited by the International Children's Centre, Paris, France, 1977, No. 110.
 60. *Famille et Développement (F&D)*. Cycle Communications sponsored by the Ford Foundation. Sub-Saharan Africa's Self-Help Magazine by S.D. McBride, published in Senegal. A. (1979).
 61. *SALUBRITAS*, published quarterly in English, French and Spanish, by the International Health Programs of the American Public Health Association under co-sponsorship with the World Federation of Public Health Associations, Washington, D.C. (1979).
 62. Storms, D. (author) notes on Geneva Meeting as note 56 above.
 63. Flahault, D. "The Respective Roles of the Community and of the Health Services in Relation to Community Health Workers." *WHO Chronicle* 32:149-153, 1978.
 64. Mertens, P., op. cit., same as note 37 above.
 65. *Narangwal Population Study Report*. Department of International Health, Johns Hopkins University School of Hygiene and Public Health. Report of Population Project in Narangwal Village, Ludhiana, Punjab, India, 1975.

SECTION VI—EVALUATION

1. Taylor, C.E. "Stages in the Planning Process," in *Health Planning: Qualitative Aspects and Quantitative Techniques*, ed. by Reinke, W.A. Baltimore: Department of International Health, Johns Hopkins University, Baltimore, Md., 1972, pp. 20-34.
2. Denson, P.M. and Kavet, J. "Do Training Programs Work?: Principles of Evaluation," in *Intermediate-level Health Practitioners*, eds., Lippard, V. and Purcell, E. New York: Josiah Macy, Jr. Foundation, 1973, pp. 78-88.
3. Mager, R.F. *Preparing Instructional Objectives*. Belmont (CA): Fearon Publishers, 1962.
4. Kark, S.L. "Jerusalem: The Functions of Community Health Workers in Community Health Care." Paper prepared for Symposium on Community Health Workers, Airlie House, Virginia, October, 1977.
5. Behrhorst, C. "The Chimaltenango Development Project, Guatemala." *Contact 19*, February 2, 1974.
6. Habicht, J.P. "Delivery of Primary Care for Medical Auxiliaries: Techniques of Use and Analysis of Benefits Achieved in Some Rural Villages of Guatemala." *Medical Auxiliaries*, Scientific Publication No. 278, pp. 24-27. Washington: Pan American Health Organization, 1973.
7. Essex, B. Report on East Africa made at the IXth International Conference on Health Education, Ottawa, Canada, August-September, 1976.
8. Rokeach, M. *Beliefs, Attitudes, and Values*. San Francisco: Josey-Bass, 1976.
9. Department of International Health, Johns Hopkins University. *The Functional Analysis of Health Needs and Services*. Printed in India by Asia Publishing House, New Delhi, 1976.
10. Wray, J. M.D., Visiting Professor, Office of International Health Programs, Harvard University, personal communication, August 9, 1977.

11. Taylor, C.E.; Kielmann, A.A.; Parker, R.L.; Chernichovsky, D.; De Sweemer, C.; Uberoi, I.S.; Masih, N.; Kakar, D.N.; Sarma, R.S.S. and Reinke, W.A. *Malnutrition, Infection, Growth and Development: The Narangwal Experience*. Monograph to be published by World Bank, Washington, D.C., 1980.
12. Berman, P.A. "Village Health Workers in Developing Countries: Evidence of Effectiveness and Efficiency." Thesis presented to the Faculty of the Graduate School of Cornell University, August, 1979.



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