

PN-AAK-113

ISD 12/74

**PRIMARY-CARE
HEALTH CENTERS:**

**A GUIDE
TO
PLANNING AND DESIGN
WITH
LIMITED RESOURCES**

**BOSTON UNIVERSITY
HEALTH POLICY INSTITUTE
William J. Bicknell
Eileen M. Connor**

**METCALF AND ASSOCIATES
ARCHITECTS - PLANNERS
Susan M.C. Shaw**

PRIMARY-CARE HEALTH CENTERS:
A GUIDE TO PLANNING AND DESIGN
WITH LIMITED RESOURCES

BOSTON UNIVERSITY
HEALTH POLICY INSTITUTE

William J. Bicknell
Eileen M. Connor

METCALF AND ASSOCIATES
ARCHITECTS - PLANNERS

Susan M.C. Shaw

Preparation of this work was in part supported by United States Agency for International Development, Office of Health Contract AID/DSPE-C-0085.

TABLE OF CONTENTS

	<u>PAGE</u>
ACKNOWLEDGMENTS	x
LIST OF ILLUSTRATIONS AND TABLES	xi
PREFACE	xii
1. INTRODUCTION	1
MAIN POINTS	3
WHAT IS PRIMARY CARE?	3
THE PLANNING AND DESIGN TEAM	4
PLANNING FOR PRIMARY CARE	4
THE GOAL OF THIS GUIDE	5
HOW TO USE THIS GUIDE	6
2. PLANNING FOR PRIMARY CARE	7
MAIN POINTS	9
THE PLANNING AND DESIGN TEAM	9
AVOIDING PROBLEMS	10
Inadequate Assessment of Needs	10
Poor Communication of Information	11
Failure to Consider Operating Costs	11
Insensitivity to Local Customs	11
Failure to Consider Space Requirements	11
Conclusions	12
ELEMENTS OF SUCCESSFUL PLANNING AND DESIGN	12
Communication and Coordination	12
Considering Local Factors	13
POLITICAL FACTORS	13

	<u>PAGE</u>
3. PLANNING AND DESIGNING THE HEALTH CENTER: AN OVERVIEW	15
MAIN POINTS	17
MAJOR TASKS	17
SCHEDULING MAJOR TASKS	18
THE STAGES IN ESTABLISHING A HEALTH CENTER	20
The Planning Stage	20
The Design Stage	21
CONCLUSIONS	22
4. PREPARING A PLAN OF SERVICES (FUNCTIONAL PROGRAM)	23
MAIN POINTS	25
THE PLAN OF SERVICES	25
MAKING REALISTIC ASSUMPTIONS	26
ISSUES AND QUESTIONS	27
What Is the Staffing Pattern?	27
What Services Will Be Provided?	28
What is the Patient Flow through the Health Center?	28
What is the Expected Utilization of Primary-Care Services?	28
What is the Schedule for Seeing Patients?	32
What Are the Administrative Policies and Procedures of the Health Center?	32
What Is the Estimated Annual Cost of Operating the Planned Center?	33
SUMMARY	33
5. DESIGNING THE HEALTH CARE BUILDING: MOVING FROM THE PLAN OF SERVICES TO THE ARCHITECTURAL PROGRAM	35
MAIN POINTS	37

	<u>PAGE</u>
THE SPACE IMPLICATIONS OF THE PLAN OF SERVICES	37
Staffing Patterns	38
Scope of Services	38
Patient Flow	39
Expected Utilization by Type of Patient	40
Schedule for Seeing Patients	41
Administrative Policies and Procedures	42
Referral Links to Other Health Facilities	43
Operating Budget	43
PREPARING AN ARCHITECTURAL PROGRAM	44
Assumptions	44
Functions	45
Relationships of Functions	45
Organizing Information	46
A Hypothetical Architectural Program	48
ALLOCATING SPACE	50
Determining Space Needs for Each Function	50
Planning for Movement of Patients and Staff	54
ISSUES AND CHOICES	54
SUMMARY	55
6. OTHER PLANNING CONSIDERATIONS	57
MAIN POINTS	59
SITE SELECTION AND PLANNING	59
Selecting the Site	59
Planning the Use of the Site	60

	<u>PAGE</u>
SANITARY PLANNING	61
Water Supply and Drainage	62
Refuse Disposal	62
Human Waste Disposal	63
Personal Hygiene and Sanitation	63
Draining of Surface Water	64
RENOVATION OR NEW CONSTRUCTION?	64
STANDARD DESIGNS	66
PLANNING FOR DRUG STORAGE	66
PLANNING FOR OPERATION AND MAINTENANCE	67
7. FACTORS AFFECTING THE BUILDING DESIGN	69
MAIN POINTS	71
THE DESIGN STAGE	71
PLANNED ACTIVITIES	72
CLIMATE AND ENVIRONMENT	72
Solar Radiation and Temperature	73
Relative Humidity	73
Prevailing Winds	73
Precipitation	73
Effects of Climate on Design	74
SITE AND TOPOGRAPHY	76
TRADITIONS AND CULTURE	76
MATERIALS AND CONSTRUCTION METHODS	77
FLEXIBILITY AND EXPANSION	77
BUILDING CODES, STANDARDS, AND GUIDELINES	78

	<u>PAGE</u>
BUDGETARY CONSTRAINTS	80
SUMMARY	80
8. SHOULD THE HEALTH CENTER INCLUDE BEDS?	81
MAIN POINTS	83
ARE BEDS NEEDED?	83
THE TYPES OF BEDS	84
Infirmarv Beds	84
Labor and Delivery Beds	85
Basic Medical Beds	86
CONCLUSIONS	88
SUMMARY	89
9. THE PROJECT BUDGET	91
MAIN POINTS	93
CAPITAL COSTS	93
Factors Affecting Capital Costs	93
Estimating Construction Costs	94
OPERATING COSTS	96
THE RELATIONSHIP BETWEEN CAPITAL AND OPERATING COSTS	97
SOURCES OF REVENUE	97
Revenues for Capital Costs	97
Revenues for Operating Costs	98
PREPARING PROJECT BUDGETS	99
SUMMARY	99
10. THE CONTEXT FOR PRIMARY CARE	101
MAIN POINTS	103

	<u>PAGE</u>
THE LARGER HEALTH CARE CONTEXT	103
MAJOR ISSUES	104
Referral	104
Supervision	104
Balancing Preventive and Curative Services	104
Integrating Services	105
The Public and Private Sectors	106
SUMMARY	107
APPENDIX A. INFORMATION: TYPES AND SOURCES	111
MAIN POINTS	113
HOW MUCH INFORMATION IS ENOUGH?	113
INFORMATION ABOUT THE POPULATION TO BE SERVED	114
INFORMATION ABOUT AVAILABLE RESOURCES	114
Manpower Resources	114
Facility Resources	115
Financial Resources	115
SUMMARY	115
APPENDIX B. CHECKLISTS	117
INTRODUCTION	119
Checklist 1. STAFFING PATTERN	121
Checklist 2. SERVICES TO BE PROVIDED	123
Checklist 3. PATIENT FLOW THROUGH THE HEALTH CENTER	127
Checklist 4. EXPECTED UTILIZATION OF PRIMARY-CARE SERVICES	129
Checklist 5. SCHEDULE FOR PATIENT VISITS	131

		<u>PAGE</u>
Checklist 6.	ADMINISTRATIVE POLICIES AND PROCEDURES	133
Checklist 7.	ARRANGEMENTS FOR RECEIVING AND STORING SUPPLIES AND DRUGS	135
Checklist 8.	REFERRAL LINKS TO THE NEXT LEVELS OF CARE	137
Checklist 9.	EVALUATING AN EXISTING BUILDING	139
Checklist 10.	ELEMENTS OF CLIMATE	141
Checklist 11.	COMPONENTS OF CAPITAL COSTS	143
Checklist 12.	SAMPLE FORMAT FOR A CAPITAL BUDGET	145
Checklist 13.	SAMPLE FORMAT FOR AN OPERATING BUDGET	147
Checklist 14.	SOCIAL, ECONOMIC, AND HEALTH INFORMATION DESIRABLE FOR ESTABLISHING A PRIMARY-CARE HEALTH CENTER	149
Checklist 15.	DESIRABLE INFORMATION ABOUT AVAILABLE MANPOWER	151
BIBLIOGRAPHY		153

ACKNOWLEDGMENTS

As is true of any undertaking of this sort, Primary-Care Health Centers: A Guide for Planning and Design with Limited Resources would not have been possible without the support and assistance of many people. We wish to express our gratitude to the United States Agency for International Development (U.S.A.I.D.) which supported this project (Contract No. AID/DSPE-C-0085). Within the Agency, special thanks go to the people in the Office of Health. In particular, we are grateful to John Alden, who recognized the need for such a document and encouraged us to pursue it, and to Clifford Pease, M.D., Jean Pease, and Irving Taylor, who were most helpful throughout the entire project.

We are also grateful to all the people around the world with whom we have worked. Their thoughtful questions and perceptive insights have made us keenly aware of the issues involved in planning for primary care and of the need for such a planning guide.

We also want to thank Phillip E. Tobey, A.I.A., and Roger C. Mellem, F.A.I.A., of Metcalf and Associates, Richard H. Egdahl, M.D., Director of the Health Policy Institute at Boston University, and Ayo Ajayi, M.B., of the Health Policy Institute, as well as many staff members of U.S.A.I.D., for their helpful reviews of the guide as it evolved.

A special note of thanks is due our editor, Barbara Gale. She understood our purpose, and her many insights and suggestions contributed substantially to the clarity of the final text.

As our work drew to a close, John Perednia's skillful supervision of final typing, lay-out, proof-reading and production was invaluable.

While this guide could not have been produced without the assistance of these people, responsibility for its content rests solely with the authors.

LIST OF ILLUSTRATIONS AND TABLES

	<u>PAGE</u>
ILLUSTRATION 1: THE SAME HEALTH CENTER DESIGN MODIFIED BY CLIMATE AND CULTURE	14
ILLUSTRATION 2: SAMPLE PROJECT SCHEDULE	19
ILLUSTRATION 3: SAMPLE PATIENT FLOW DIAGRAMS	29
TABLE 1: SAMPLE FORMAT FOR AN ARCHITECTURAL PROGRAM	47
TABLE 2: ESTIMATING THE SIZE OF THE BUILDING: AN EXAMPLE	51
ILLUSTRATION 4: ALLOCATING SPACE BY FUNCTION	53
ILLUSTRATION 5: EXAMPLE OF FLEXIBILITY: SAME SIZE PLACE BUT DIFFERENT FUNCTIONS	79

PREFACE

Since the World Health Organization's 1978 conference on primary care at Alma Ata, countries all over the world are more actively pursuing the declared goal of extending primary-care services to all members of their populations. But debate continues about just what primary-care health services are and how they should be delivered.

Often it is not recognized that many facets of establishing a health center, such as analyzing health needs, planning the program, assessing overall operating costs, and designing the building, are interrelated. Primary-care programs are typically planned without taking into account the factors that influence building design. Or the building is designed without any consideration of the goals of the health-care program. All too often, the result is a program for which a suitable building cannot be constructed, or a completed building which interferes with the effectiveness of the program.

Clear, succinct guidelines for planning primary-care programs and the buildings to house them are urgently needed. Such guidelines must be appropriate and realistic. In addition to the basic principles of program planning and building design, they must deal with social, cultural, technological, and cost issues.

This planning guide attempts to satisfy those needs. In it we emphasize the importance of activities in the early stages of planning and design. And we recommend that all the people responsible for program planning and building design come together early and often throughout the process of establishing a primary-care health center.

This guide is meant to be self-explanatory and nontechnical. We have tried to make the language clear and uncomplicated, so that the guide can be used by people for whom English is a second language, as well as by those whose first language is English.

Rather than specifying particular steps to be taken in every situation, we have provided questions to ask and checklists to pinpoint issues that need attention in the planning and design process. Since no two situations are identical, the reader will often have to adapt the suggestions made in this guide to fit individual circumstances.

We hope this guide will be flexible enough to be useful in a variety of situations and geographical areas. It is aimed primarily at those involved in planning for health care--particularly doctors, nurses or auxiliaries, and other health workers--at building designers, including architects and engineers, and at administrators and educators in the public sector. In addition, it may be useful to those concerned with development in the private sector and to donor agencies and national planners whose responsibility it is to review planned health centers.

William J. Bicknell, M.D., M.P.H.
Susan M.C. Shaw, M.Arch.
Eileen M. Connor, M.P.H.

January 1982

I. INTRODUCTION

MAIN POINTS

WHAT IS PRIMARY CARE?

THE PLANNING AND DESIGN TEAM

PLANNING FOR PRIMARY CARE

THE GOAL OF THIS GUIDE

HOW TO USE THIS GUIDE

I. INTRODUCTION

MAIN POINTS

Simply put, primary care means basic medical services. It includes "curative services," or the treatment of common illnesses and injuries, and "preventive services," such as family planning, immunization, and health education, which are aimed at preventing health problems.

The primary-care health center is the building in which these services are provided, or which primary-care health workers use as their base. Taken together, the services provided at the health center are referred to as the primary-care health program.

Since resources are always limited, sometimes severely, the costs of starting and sustaining a primary-care health program must be anticipated, and realistic plans must be made for fully meeting these costs.

WHAT IS PRIMARY CARE?

The core of primary care is what are called basic medical services--the kind of care most people need most of the time. This kind of care includes such things as the treatment of illnesses that are common but not always simple. In every setting, primary care involves treatment of upper and lower respiratory infections, skin disorders, intestinal parasites, and diarrhea. Other diseases or health problems fall within the framework of primary care in a specific country or area, depending on how common they are. Some examples are:

- Schistosomiasis in Egypt
- Frostbite in Alaska
- Malaria in Haiti

The treatment of minor trauma (accidents or injuries) is also an integral part of primary care. Caring for diseases, injuries, or other health problems is the basis of curative services.

Preventive services are also an integral part of primary care. They include:

- Immunization

PREVIOUS PAGE BLANK

4 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

- Prenatal care
- Family planning
- Check-ups for healthy children ("well-child" care)
- Nutrition and sanitation education

Generally, preventive services are aimed at maintaining maternal and child health. These services are usually delivered to one person at a time, along with curative services, or in small groups.

Health workers who provide primary care, whether they are doctors, nurses, auxiliaries, midwives, or others, must be able to identify what is beyond their skills as well as what they can treat. Depending on the local situation, they must know when to ask for help, when to refer the patient to another health center, or, if referral is impossible, how to decrease pain and console the patient and the family.

THE PLANNING AND DESIGN TEAM

All the different people who are responsible for deciding what health services are necessary in the area to be served and what sort of building should house them make up the planning and design team. This team includes two groups of people.

Those in the first group are mainly familiar with issues of health. They may be doctors, nurses or auxiliaries, midwives, other health workers, and national or regional health planners. Those in the second group are mainly familiar with the requirements of buildings, site planning, sanitation, and other physical elements of establishing a health center. They may be architects or engineers and contractors. The ideas and perceptions of local community members and leaders can be highly relevant to both groups, though they are often overlooked. Other members of the planning and design team may be representatives of donor organizations.

In this guide we have used certain terms for these team members: for instance, nurse or auxiliary, and architect or engineer. The definition of these terms will vary in different cultures or countries, as will their training and skills. Not all centers will employ all the types of health workers mentioned. In general, the context of the discussion should indicate the responsibilities of the person clearly. Whatever term is used, the person who has those responsibilities is the one being referred to.

PLANNING FOR PRIMARY CARE

Three of the most important questions to be asked in planning a primary-care health center are:

1. In an ideal situation, who should do what, when, where, and at what cost?
2. In the current situation, who does what, when, where, and at what cost?
3. Is it possible to move from the current setting to something closer to the ideal situation?

If the answer to Question 3 is no, then the planning and design team must modify their concept of what is desirable for the country or area so that a program that is both desirable and achievable can be defined.

Questions 1, 2, and 3 should be asked again. Modifications in the program may make it possible to come closer to the services the team considers desirable. Members should consider what specific steps must be taken in terms of training, organization, and maintenance and whether the necessary money and staff are really available. The process of identifying what exists, what is desirable, and how to get from what exists in the present to what is desired in the future is difficult but necessary.

A realistic program of services, one that can be accomplished within the social, cultural, and economic constraints of a specific country, must be identified. The process of asking questions and changing plans must be repeated until agreement is reached that what is planned is truly practical. Putting off this kind of decision-making and ignoring potential problems, such as shortages of money or people to operate a program, is not wise. It may be comfortable, but it is shortsighted and leads to wasted money and poor services.

Primary care, to be effective, must be affordable. Therefore, great care must be taken in planning services and buildings to ensure that enough money will be available to sustain programs (buy supplies, pay staff members, and maintain buildings and equipment) year after year.

THE GOAL OF THIS GUIDE

The goal of this guide is to bring together all the people responsible for planning the program of services for the health center and for designing the building. They should meet early and often throughout the planning and design stages. Nurses and auxiliaries, doctors, health planners, architects or engineers, community leaders, and contractors need to make decisions together about issues like these:

- The services to be provided
- The location of the health center
- The roles of different health workers

- The cost of services
- The design of the building

Interaction among these members of the team, who have different areas of knowledge, helps avoid misunderstandings and the kind of problems that misunderstandings can cause. The result should be better building designs and better primary-care health programs at a cost that can be afforded.

HOW TO USE THIS GUIDE

This guide is meant to provide assistance to members of the planning and design team. Not everything in it will apply to every situation. Instead, the descriptions and questions are intended to fit a variety of situations and circumstances. What we have tried to do is present a systematic approach to avoiding potential problems by emphasizing basic principles rather than rules or specific procedures to be followed rigidly. How these principles are applied depends on the creativity and ingenuity of the planning and design team.

In an effort to clarify these principles, we have concentrated on describing the steps in the two earliest stages--planning and initial design--in the process of establishing a primary-care health center.

The rest of this guide is organized according to major topics or issues that are important in the process of establishing a primary-care health center. CHAPTERS 2 and 3 discuss general issues in planning for primary care and present an overview of the process. CHAPTER 4 describes the questions and issues that must be considered in detail when planning a program of health services. CHAPTER 5 suggests ways of assessing the influence of the planned services on the amount and kind of space needed. Other issues that must be addressed in translating the program of services into a preliminary building design are discussed in CHAPTER 6.

CHAPTER 7 describes other factors that may affect the design of the building, particularly those related to the proposed site. CHAPTER 8 presents the advantages and disadvantages of including beds in the planned health center. CHAPTER 9 discusses the components of the project budget (costs and revenues). CHAPTER 10 describes the larger health-care system within which primary care must be planned.

APPENDIX A explores the issue of how much information, and what kind, is necessary to begin planning and designing a health center. APPENDIX B provides checklists to be used as guides in gathering and organizing information. Finally, the BIBLIOGRAPHY lists useful sources of further information about the various aspects of establishing a primary-care health center.

2. PLANNING FOR PRIMARY CARE

MAIN POINTS

THE PLANNING AND DESIGN TEAM

AVOIDING PROBLEMS

- Inadequate Assessment of Needs

- Poor Communication of Information

- Failure to Consider Operating Costs

- Insensitivity to Local Customs

- Failure to Consider Space Requirements

- Conclusions

ELEMENTS OF SUCCESSFUL PLANNING AND DESIGN

- Communication and Coordination

- Considering Local Factors

POLITICAL FACTORS

2. PLANNING FOR PRIMARY CARE

MAIN POINTS

This guide describes the process of planning and designing a primary-care health center with limited resources--most often shortages of money, manpower, materials, and technology. Health planners, architects, engineers, doctors, nurses or auxiliaries, and others need to understand the strategies for establishing a primary-care health center that is effective and affordable. Two points are stressed:

- Those responsible for planning the program of services and those responsible for designing the building must interact (share information and decisions) throughout the process.
- Certain aspects of program planning strongly affect the requirements for appropriate and effective building design. These activities should be considered together.

THE PLANNING AND DESIGN TEAM

Establishing a primary-care health center requires the participation of two groups of people working closely together. They are:

- Program Planners. The people who will be providing and using the health services, plus people who are knowledgeable about health issues and those representing the government or organization sponsoring the health center. Included in this group are doctors, nurses or auxiliaries, midwives, other health workers, local leaders and community members, ministry officials, donor representatives, and others.
- Building Designers. The people who will plan the site, design the building, and make plans for water supplies, maintenance, and other aspects of the physical setting in which primary-care services will be provided. This group includes architects or engineers, contractors, experts on sanitation, and others. It may also include, once again, ministry officials, local leaders, and donor representatives.

Note that the terms used for any of these people may differ in different countries or cultures.

Together, these two groups of people are referred to as the planning and design team. It is their joint responsibility to plan a useful program of services

FOR THE PEOPLE OF THE WORLD
A COMMITMENT TO BETTER HEALTH CARE

and design a building to house those services efficiently. The services and the building together make up the primary-care health center.

Two principles are central to the process of establishing a primary-care health center:

- Integrated Teams. From the first steps in planning the primary-care health center, members of the planning and design team must work together. In particular, the people who will provide the services must work with the people responsible for planning, designing, and constructing the building.
- Integrated Activities. Although each situation is unique, some typical questions must be asked by the members of the team in all situations. Examples of such questions are: What services will be offered? Who will provide these services? Where, when, and at what cost will these services be provided? And how will these services affect the kinds of spaces that should be included in the building design? The planning and design process must be discussed by all the team members. Information and opinions should be shared, and the reasons for decisions and their consequences must be well understood.

AVOIDING PROBLEMS

Problems often arise when the people who are establishing a primary-care health center are not sure how to proceed. Some examples of typical problems that might have been avoided are described below.

Inadequate Assessment of Needs

In one African country, a health center was built that was approximately twice as large as it needed to be and employed about twice as many staff members as were really necessary. As a result, the health center was underutilized and building costs were higher than necessary. People in other areas or with other health-service needs were not cared for, and scarce resources were poorly used.

In this case, the problem arose because planners did not consult local leaders about the real needs of the population.

In another country, a primary-care health center was designed and built by a foreign donor, whose staff did not know how many people are usually seen each day in a center of this type. Using Western standards, the donor designed a building to serve about 50 patients a day. But 500 to 1,000 people arrived each day once the health center opened. As a result, the staff had to spend time dealing with serious problems of crowding, rather than caring for patients.

In this case, the donor failed to gather information about the local demand for health services. And the donor did not ask local health workers or others

familiar with the area what they knew about the number of patients who would probably want health services each day.

Poor Communication of Information

In one Latin American country, more than a hundred health centers were constructed with the assistance of an international donor agency. But there was no one to staff them. By the time the centers were completed, only three staff members were trained to work in the centers. As a result, the centers were not used. The people in the areas did not receive health care, until another donor supplied the money and technical assistance to train health workers to staff the centers.

In this case, the problem was a breakdown of communication between manpower planners, who were aware of the lack of trained health workers, and other planners, who were responsible for designing the centers and for deciding how many to build.

Failure to Consider Operating Costs

Foreign aid paid for the construction of several hundred small health centers in many different regions of a country, but there were no firm plans for continued funding or for new supplies of drugs. Not long after the centers opened, approximately one-third were short of drugs and money for operating expenses. These centers had to close down. The result, in some cases, was confusion and cynicism among the community. In all cases where centers closed, the people received no basic medical services and the construction money was wasted.

In this case, the problem was the failure of health planners to consider the long-range operating costs of the health centers.

Insensitivity to Local Customs

In a culture where it is customary for at least four or five family members to accompany patients to the health-care center, a system of primary-care centers was built with little or no waiting space. The result has been serious overcrowding. Patients have been discouraged by this problem from seeking care.

In this case, the designers of the health centers were insensitive to local health-care practices and to customs and traditions related to the role of the family.

Failure to Consider Space Requirements

The outreach services in one region were based at a district hospital. But the maternal and child-health workers and traveling malaria-control workers needed to stop at the rural health centers in the communities they served. No space was provided for these workers to perform administrative tasks such as

12 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

record-keeping or to store supplies. Their arrival at the health centers usually disrupted routine patient care. The resulting confusion increased the length of time it took the outreach workers to complete their work at the health centers.

In this case, the designers of the health centers did not take into account all the space requirements for the buildings.

Conclusions

These examples illustrate the importance of integrating the work of different members of the planning and design team and different activities. In order to increase communication and coordination, doctors and health planners (program planners) need to understand how architects and engineers (building designers) think and how they work, what they tend to assume, and what information they need. Similarly, architects and engineers must understand how health workers think and must be familiar with their concerns and with their vocabulary.

Both program planners and building designers need to understand the needs, information requirements, and motivations of the government officials, local leaders, and representatives of agencies who are involved in planning the health center. This type of mutual understanding is basic to the effectiveness of the team.

ELEMENTS OF SUCCESSFUL PLANNING AND DESIGN

Effective primary-care planning and building design require more than just avoiding the problems that can result from failure to assess needs, lack of planning, poor communication, or cultural insensitivity. Sensible design requires communication and coordination among the members of the planning and design team. It also requires understanding the importance of diverse local factors such as climate, customs, and available construction materials.

Communication and Coordination

Primary care by its very nature cuts across many traditionally separate disciplines. It almost always includes elements of curative and preventive medicine, and it often includes family planning, nutrition and health education, epidemiology, sanitation, and other public-health concerns. This diversity presents both problems and opportunities for people engaged in planning primary-care health services and designing primary-care health centers.

Diversity may lead to fragmentation, competition for limited resources, misunderstandings, and costly mistakes, examples of which have been described above. On the other hand, because it touches on so many disciplines, planning for primary care presents an opportunity to integrate many traditionally separate segments of the health-care system. Effective primary-care health planning and responsive building design can result only when these diverse groups come together, communicate with one another, share assumptions, understand one another's objectives, and coordinate their plans and activities.

Considering Local Factors

Local factors such as climate, customs, and available materials must also be considered. A building that makes sense for one location does not necessarily make sense for another with different climate, customs, and local construction materials.

For example, the outside appearance and the arrangement of rooms (floor plan) of a health center designed for a temperate zone in Central Africa may be quite different from the outside appearance and floor plan of a health center in a hot-dry climate in a predominantly Moslem country in Northern Africa. This is true even though the two centers may provide the same primary-care services and employ the same number of people. ILLUSTRATION 1 summarizes differences in design between similar centers in two different countries.

In the process of establishing a primary-care health center, there are problems to be avoided as well as opportunities to be gained. It is our aim to help you do both.

POLITICAL FACTORS

Planning, designing, and operating a primary-care health center are not isolated activities. Instead, the establishment of any health center is an integral part of overall development of the health-care system, which, in turn, is only one part of an even broader process of social, economic, and political development. Health planners and building designers rarely, if ever, have complete authority and final decision-making power.

Decisions that are made in the course of planning, constructing, and operating a primary-care health center are often intended to resolve conflicts within one of these larger spheres, or they may reflect policies established in the broader development process. Sometimes a decision is made by a political leader that does not make sense but must be carried out.

We are aware of and sensitive to these realities. But it is outside the scope of this guide to consider in detail the particular political, social, and economic factors that influence the planning, construction, and operation of a primary-care health center. Our intent is not to minimize the significance of political, social, and economic factors. On the contrary, it is our recognition of their immense importance that keeps us from presuming to anticipate every issue.

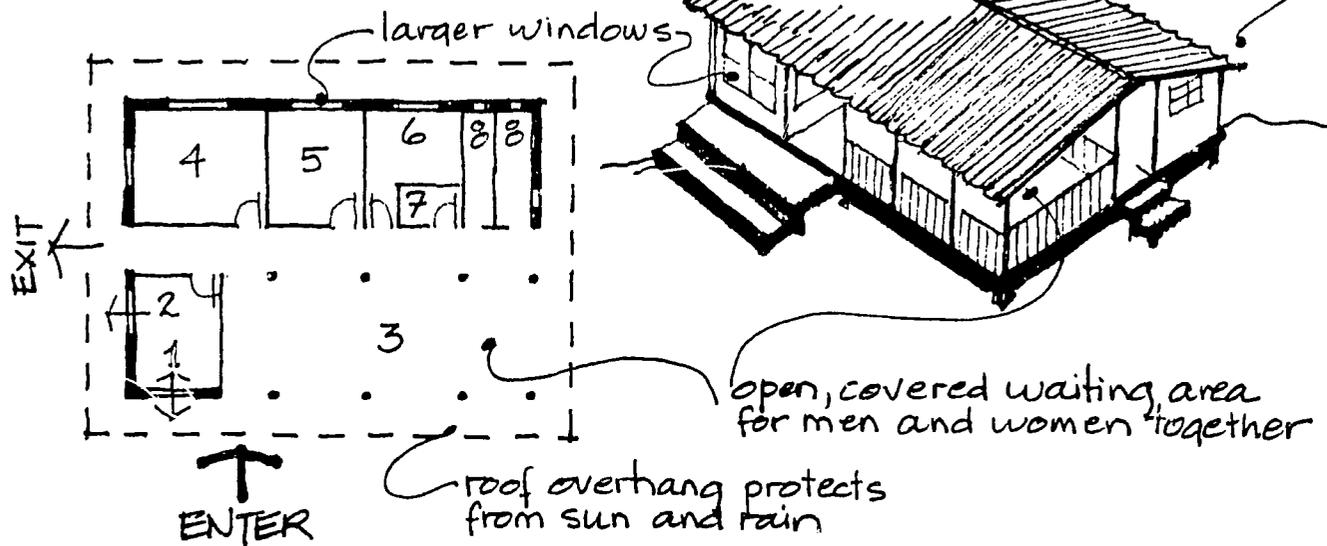
ILLUSTRATION I

THE SAME HEALTH CENTER DESIGN MODIFIED
BY CLIMATE AND CULTURE

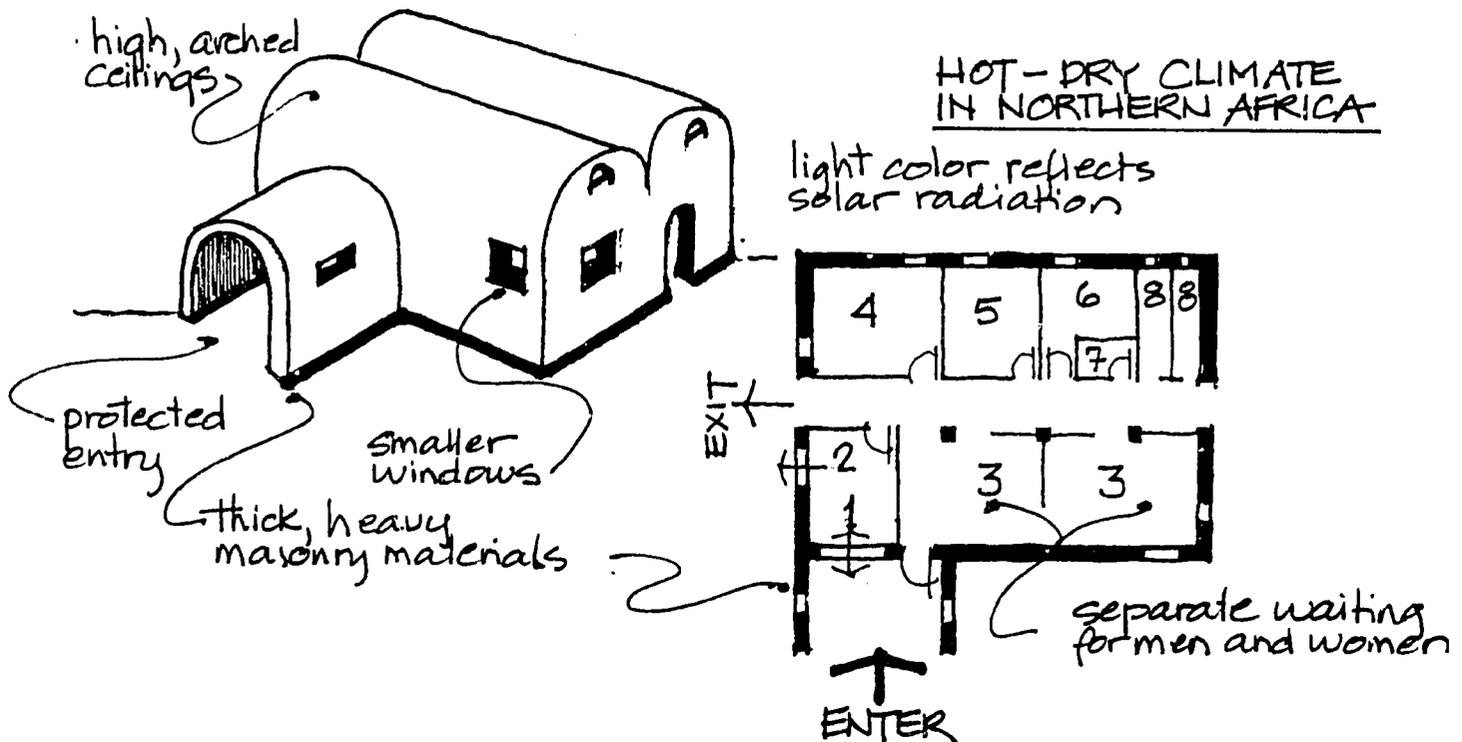
KEY

- | | | |
|------------------------------|---------------|--------------|
| 1 Registration | 4 Treatment | 6 Laboratory |
| 2 Dispensary | 5 Examination | 7 Storage |
| 3 Waiting + Health Education | | 8 Toilets |

TEMPERATE CLIMATE
IN CENTRAL AFRICA



HOT-DRY CLIMATE
IN NORTHERN AFRICA



3. PLANNING AND DESIGNING THE HEALTH CENTER:
AN OVERVIEW

MAIN POINTS

MAJOR TASKS

SCHEDULING MAJOR TASKS

THE STAGES IN ESTABLISHING A HEALTH CENTER

The Planning Stage

The Design Stage

CONCLUSIONS

3. PLANNING AND DESIGNING THE HEALTH CENTER: AN OVERVIEW

MAIN POINTS

The process of planning, designing, and actually setting up a primary-care health center is a dynamic one. It is made up of many separate activities, or tasks, which can be grouped in two ways. First, these tasks can be grouped according to the general type of activity they involve. These major tasks are also called "project components." Second, the necessary tasks can be grouped according to the broad time period during which they should be completed. These time periods are called the stages of the project.

MAJOR TASKS

Establishing a primary-care health center is a complex process that includes all the steps from deciding that a health center is needed to moving into the building and treating patients. This guide has been written to provide a practical and straightforward description of the early stages of this process.

Numerous tasks need to be accomplished in planning and designing the center. In reality, these tasks are not completely separate. But it is easiest to see what must be done if the tasks are grouped into major tasks, or project components. The seven major tasks are:

1. Evaluating what health services are needed by the people in the area (health-service needs) and estimating what consumers want in the way of health services (wants or demands).
2. Deciding what health services to offer (the program of health services). This is a very important step, since needs and wants can only be partially met when resources are limited.
3. Estimating how often the services that are offered are likely to be used (utilization).
4. Deciding how many workers of different types are needed (staffing patterns) and what tasks they will perform (staff roles).
5. Designing the health-center building.
6. Specifying what furnishings, equipment, and supplies are needed.

PHOTOGRAPHY

7. Preparing budgets that show initial expenses (the capital budget) and on-going costs of running the center (the operating budget), as well as sources of money to meet all projected costs (revenues).

All of these tasks should be completed before actual construction work begins.

Some tasks must be done in a particular order. For example, most of the steps involved in determining what health services are needed by the local population can and should be completed before a program of primary-care services is decided upon. The services to be offered and the numbers and skills of the staff members should be specified before an architect begins to design the building.

Other tasks can be undertaken simultaneously. For instance, the building can be constructed, the equipment can be ordered, and the staff can be trained at the same time. Utilization estimates must come before and relate to staffing decisions. No final decisions should be made until Major Task 7 (preparing budgets) is completed. Projected revenues (sources of money) must be sufficient to cover construction and operating costs.

SCHEDULING MAJOR TASKS

All of the necessary tasks can also be organized in terms of when they must be accomplished. These periods of time can be called stages. In planning and reviewing progress, it is often helpful to draw a timetable, or schedule of the major tasks (see ILLUSTRATION 2). Drawing up a schedule is a way to answer questions like these:

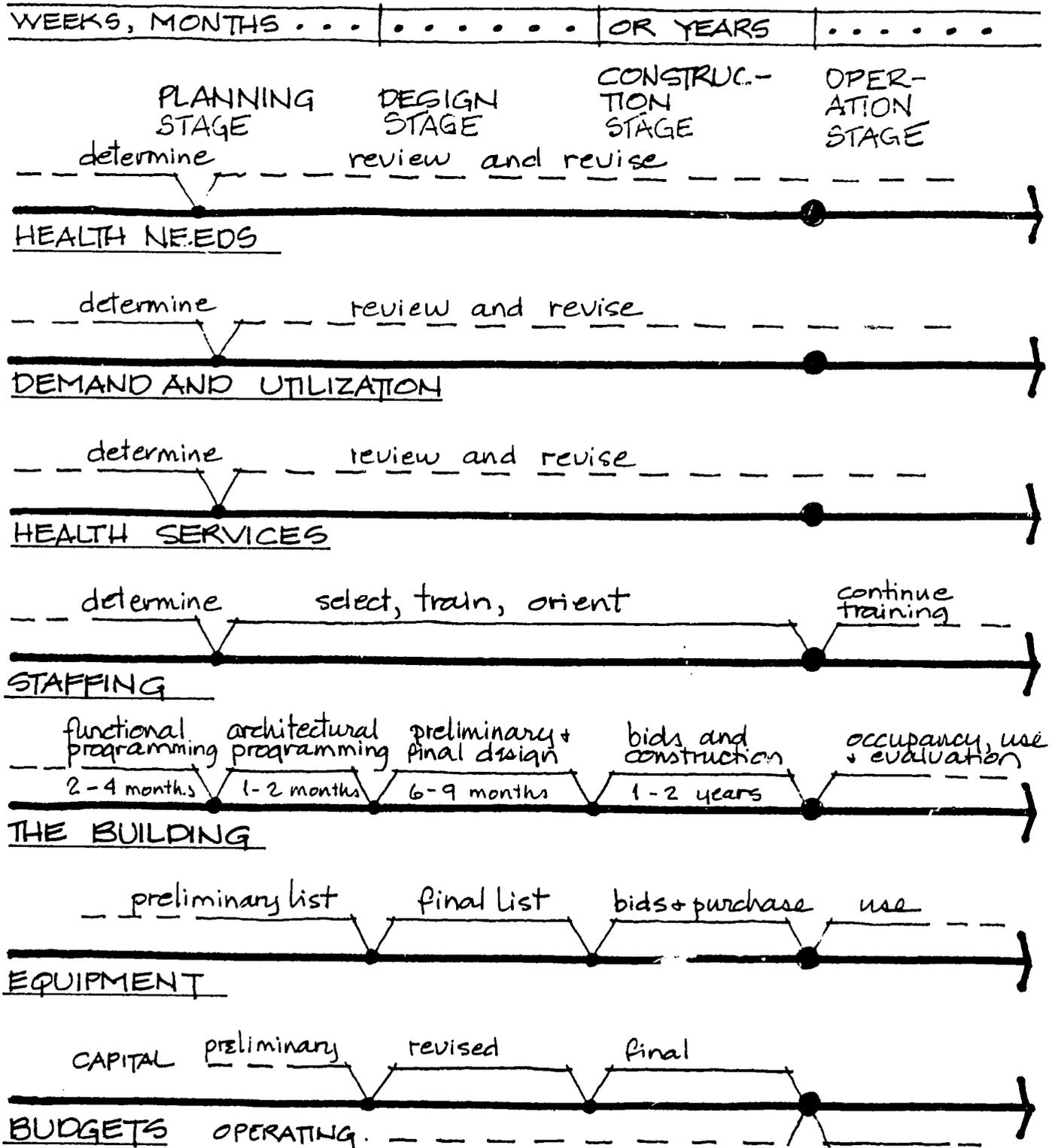
- What major tasks need to be done?
- What tasks must precede other tasks?
- What tasks can be done simultaneously?
- Where do different stages seem to occur?
- What are some of the implications of changes along the way?
- Where do major decisions need to be made?
- Which tasks are behind schedule?
- Where are reviews by different agencies or ministries needed?
- Who is responsible for what tasks?

Major tasks, or project components (left column in ILLUSTRATION 2), tend to be similar in most situations. But the specific steps that make up the major

ILLUSTRATION 2

SAMPLE PROJECT SCHEDULE

The project schedule provides a framework for seeing both tasks that should be performed at the same time and tasks that must be performed in a particular order.



tasks and the length of time it takes to accomplish them may vary. For example, in one country or region, information on health-service needs may have already been assembled for another project. It will therefore be readily available. In another country or region, this information may need to be gathered, and that will require more time.

Similarly, review and approval of building designs may take six months in one place and only one month in another. Timetables and schedules in different areas or for different projects always look different. This kind of variation is inevitable; there are always differences between projects. Such differences are not important.

It is important, however, for the members of the planning and design team, who are responsible for the project, to understand that major tasks and decisions are interrelated and to see the implications of changes that will inevitably occur. This understanding should be established early in the process of planning for a primary-care health center.

THE STAGES IN ESTABLISHING A HEALTH CENTER

Just what tasks are scheduled for each major stage may also vary from situation to situation. But in all cases the stages are defined by the major decisions that must be made or documents that must be completed at the end of each. The major decisions involved in planning, designing, and constructing the health center can be useful in defining the stages of the entire project because they provide answers to basic questions about services to be offered, staffing, costs, building construction, and design.

As ILLUSTRATION 2 shows, there are four main stages in establishing a health center:

- Planning
- Design
- Construction
- Operation

In this guide we discuss only the first two stages in detail. The focus of the guide is on the earliest stages--the planning stage and the early parts of the design stage--and on the ways in which decisions made during the planning stage affect the design of the building.

The Planning Stage

Before designs are prepared for a new or renovated building, many tasks must be accomplished. These tasks are not restricted to the fields of architecture

or engineering. Instead, they are part of every major planning task, including assessment of health-service needs, determination of the services to be provided, and estimates of costs and of available funding.

Accomplishing these tasks should be a team effort. The information gathered and the decisions made should be shared with the entire planning and design team. As part of the planning stage, the architect or engineer, planners, doctors, nurses or auxiliaries, and other health workers should together prepare a Plan of Services (often called a Functional Program by architects). This Plan of Services summarizes in writing the objectives of the health center, services to be provided, expected staffing pattern, utilization, work loads, organizational structure, costs and revenues.

Using the Plan of Services (Functional Program) the architect or engineer then continues to work closely with the other members of the planning and design team to prepare a second document, called the Architectural Program. This document specifies the space needs of the health center on the basis of the Plan of Services. It also allocates net square meters of floor space to particular activities or kinds of services and shows the relationship of one room or area to another.

The Plan of Services and the Architectural Program should both be prepared during the planning stage. At the same time, decisions should be made about the location of the health center, whether to renovate an existing building or construct a new one, and how much money is available for construction and later operating costs.

The Design Stage

In addition to those just outlined, some other tasks must be completed before the final drawings used in construction are prepared. As in the planning stage, these tasks include technical architectural jobs such as determining building materials, types of soils, slope, topography, terrain, and potential methods of waste disposal. But they are not restricted to technical tasks. Costs (both construction costs and future operating costs) need to be reviewed and determined to be affordable. Arrangements for staffing need to be made final. And lists of equipment must be prepared and reviewed to ensure that the final design will allow for the needed equipment.

The points at which major decisions about the design and construction of the building must be made are the preparation of preliminary drawings or layouts, the completion of final or "working" drawings, and the beginning of actual construction. These "decision points" are significant because any changes made later on can prove very costly, although changes will still be possible.

A seemingly small change in the assumptions on which the program is based can have a significant effect on staffing, work load, and building requirements. For instance, doubling the number of injections given each day, or cutting the number of family members accompanying the patient in half, or

increasing the operating hours of the health center from four to six hours each day, will profoundly affect the work load of health workers, the amount of waiting space that is needed, and the quantities of supplies and equipment needed.

All of these changes may have specific effects on the actual design and layout of the health center. More injections may require a bigger supply closet, more drugs, more needles, more syringes, and a larger capacity to sterilize syringes and needles. Fewer family members may mean substantially less waiting space in and around the health center. A longer operating day may also decrease the amount of waiting space needed.

CONCLUSIONS

It is crucial to make every effort to be sure that members of the planning and design team coordinate their activities and share all their assumptions and decisions in the early stages of establishing a primary-care health center. When the team members work together in the early stages, it is more likely that the building eventually designed and built will help, rather than hinder, the smooth functioning of the primary-care health program when it begins operation.

4. PREPARING A PLAN OF SERVICES (FUNCTIONAL PROGRAM)

MAIN POINTS

THE PLAN OF SERVICES

MAKING REALISTIC ASSUMPTIONS

ISSUES AND QUESTIONS

What Is the Staffing Pattern?

What Services Will Be Provided?

What Is the Patient Flow through the Health Center?

What Is the Expected Utilization of Primary-Care Services?

What Is the Schedule for Seeing Patients?

What Are the Administrative Policies and Procedures of the Health Center?

What is the Estimated Annual Cost of Operating the Planned Center?

SUMMARY

4. PREPARING A PLAN OF SERVICES (FUNCTIONAL PROGRAM)

MAIN POINTS

This section describes the steps in preparing a Plan of Services (Functional Program), a written document which summarizes the objectives of the health center, the services to be provided, expected staffing, utilization, work loads, and organizational structure. A set of detailed questions to be used in preparing the Plan of Services is provided.

THE PLAN OF SERVICES

Very early in the process of establishing a primary-care health center, the planning and design team should decide on the basic elements of the primary-care program being planned. Before new buildings or renovations are designed, all the members of the team should understand and agree on these elements:

- The objectives of the program
- The number and types of staff members
- The services to be provided
- The expected utilization of services
- The links to other levels of care
- The organizational policies of the center

One way to ensure that these elements are clearly understood is to prepare a Plan of Services, sometimes called a Functional Program. The Plan of Services presents this information in written form and gives each member of the team an opportunity to review, comment on, and agree or disagree with the planned program. Although the term "Plan of Services" may not be familiar, the type of information it includes is certainly not new. The Plan of Services gives detailed answers to the following basic questions:

- What primary-care services will be provided?
- When? (hours and days)
- Where? (location)

FORNERS FOR FORNERS

- By whom? (staffing)
- For whom? (population served)
- How will the work be organized?
- What will the services cost?

The answers to these questions are important, not only because they define the planned program but also because they help determine how much space, and what kinds of rooms or areas, are needed.

MAKING REALISTIC ASSUMPTIONS

A Plan of Services must reflect the specific situation, and it must be as detailed and realistic as possible. A Plan of Services is not a statement of what would be nice or what ought to be. Instead, preparing the Plan of Services gives the planning and design team a chance to address important issues realistically. To prepare the Plan of Services, they must decide what kinds of services the available staff will have the time and skills to provide--both at first and in the near future.

When accurate information is not available, it is necessary to make realistic assumptions, or best guesses. These assumptions can then be revised as decisions are made about specific issues. The statements below, about a hypothetical health center, show the kind of detail that is required to prepare a useful Plan of Services.

Sample Assumptions

- The health center will be open four hours a day, six days a week.
- On the average, each patient will be accompanied by two family members.
- Nurses or auxiliaries will see up to 12 patients an hour on the average.
- A part-time doctor will work one four-hour day each week. He will see an average of 15 patients per hour. After two years he will work full-time.
- One out of every five patients will receive an injection, on the average.
- One out of every four patients, on the average, will require simple laboratory work (urine or stool analysis).
- The receptionist will register patients, dispense drugs, and keep the medical records.

The specific assumptions made about a particular health center may be quite different from these sample assumptions. Assumptions must be as realistic as possible, and they must reflect the specific details of the situation. The value of making specific assumptions is that planners, health workers, and architects or engineers--that is, the planning and design team--can see more precisely the effects of a specific decision.

It is not very important whether you assume that nurses, or auxiliaries, or doctors see four patients an hour, or 30 patients an hour, or whether one out of every five patients or one out of every ten patients requires laboratory services, or whether a health worker is responsible for one task or 15 tasks. But it is very important for the entire team, including the architect, to understand and discuss the numbers that have been assumed and to know what the consequences of those assumptions are.

ISSUES AND QUESTIONS

The following questions suggest the type of issues that need to be resolved in preparing a Plan of Services:

- What types of staff members and how many, will be employed (staffing patterns)?
- What services will be provided?
- How will patients move through the health center (patient flow)?
- What is the expected utilization of primary-care services?
- What will be the hours for seeing patients (schedule)?
- What are the administrative policies and procedures of the health center?
- What are the referral links to the next levels of care?
- What is the projected cost of operating the planned center for a year?

For each of these questions it is helpful to provide two answers, even if they are only estimates: one for the first year of operation, and one for two to five years in the future. The answer for the first year represents the "minimum." The answer for the future represents the "desirable or optimum."

What is the Staffing Pattern?

The single most important element in establishing a primary-care health center is the available staff. To a large extent, the number, types, and skills

of the available staff will determine what types of services can be provided, how many patients can be treated, how flexible the program is, what type of building is needed, and, ultimately, how practical it is to establish the health center.

It would be foolish to plan a program of services and to design, construct, and furnish a building if there were no one to provide services and use the building. So one of the first questions to ask in preparing the Plan of Services is about staffing the center. CHECKLIST 1 suggests some useful questions to ask. (All of the checklists are in APPENDIX B, at the back of this guide.)

What Services Will be Provided?

A detailed list of the services to be provided at the primary-care health center must be prepared. The list should indicate whether particular services will be provided to children, adults, or both, and whether the services will be provided right away (in the first year) or later on.

The list of services is important because it influences the type of staff members needed, whether they must be trained or retrained, the probable utilization of the health center, the amount of space required, and whether special equipment is needed. CHECKLIST 2 suggests some services that might appear on such a list.

What is the Patient Flow Through the Health Center?

It is important to consider the movement of patients through the health center--both what is typical and what is desirable. The two are not always the same. For example, it may be typical for all patients to see the same nurse, or auxiliary, or doctor, regardless of why they have come to the center. This practice may result in duplication of services and poor use of staff time.

What may be more desirable in this situation is to have someone screen the patients, perhaps when they register, and group them by their reasons for visiting the health center. The most urgent cases can then be seen first, and patients who need only a refill of drugs can go directly to the drug dispensing area. This sort of screening will result in a patient flow that is desirable but not necessarily typical. (See ILLUSTRATION 3 for some sample patient flow diagrams.)

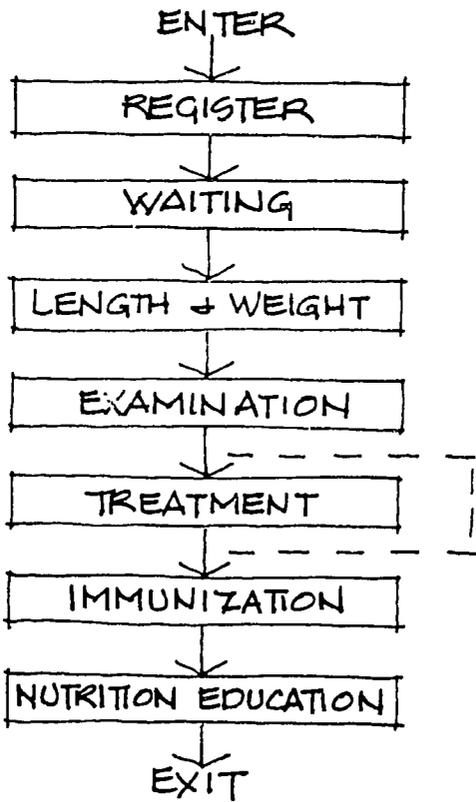
Deciding how to manage patient flow is particularly important when you are allocating space and designing a building. CHECKLIST 3 suggests some useful questions about patient flow.

What is the Expected Utilization of Primary-Care Services?

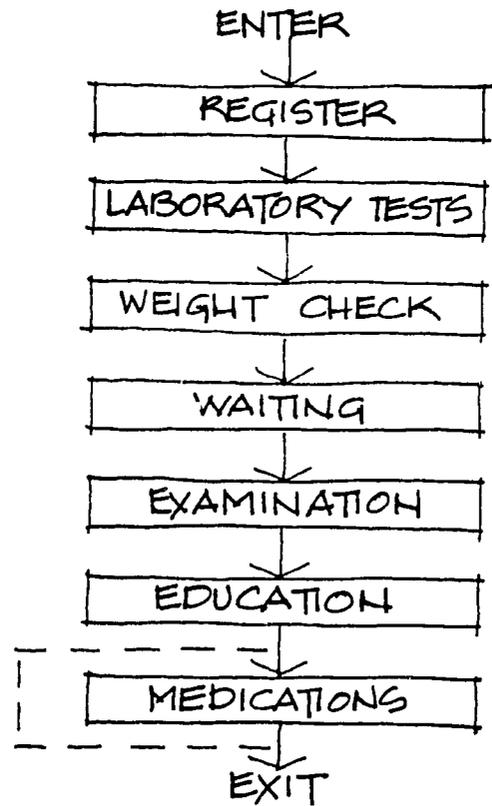
Another important factor in preparing a Plan of Services is the number and type of patients who will use primary-care services. When this information is put together with assumptions about how often each type of patient will visit

ILLUSTRATION 3
SAMPLE PATIENT FLOW DIAGRAMS

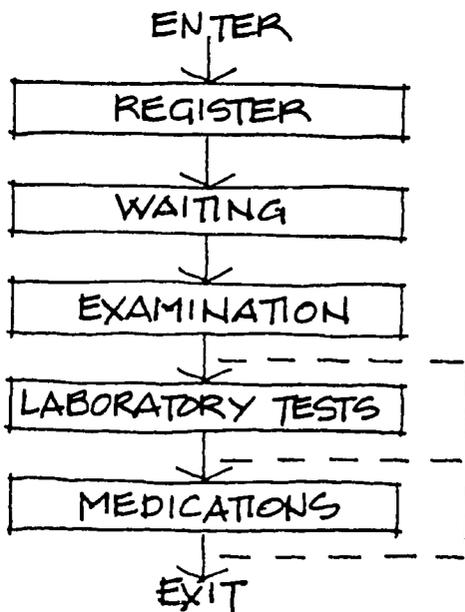
WELL-BABY VISIT



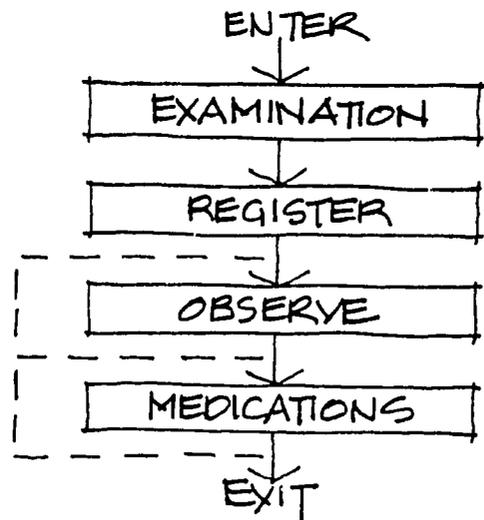
PRENATAL VISIT



ADULT MEDICAL VISIT



EMERGENCY VISIT



the health center, it becomes possible to estimate utilization. Utilization is defined as the total number of visits to the health center during a certain period of time.

In situations where resources are limited, the demand for services does not determine utilization all by itself. If a health center has only one health worker and if no one else in the community can provide services, then that person's skills and productivity (how many patients he or she can see in an hour or a day) will determine utilization--not the number of people seeking care. Utilization depends on the demand for services plus the skills and productivity of available staff. Because this information is relevant to program planning and building design, it is essential to include it in the Plan of Services.

Here are some suggestions for ways to predict the utilization of primary-care services:

- Compare a nearby health center. If there is a health center not too far away, check its patient register or log, or count the number of patients on several different days. Be sure to note any differences between that center and the one being planned that might alter the utilization pattern. For instance, perhaps the new center will provide nutrition education and maternal and child-health services which are not provided by the existing center.
- Estimate the population of the area. If no similar center exists nearby, estimate the population within a "reasonable" travel time. This may vary from 30 minutes to four hours, depending on the area and the usual modes of transportation. Once you have a fairly reliable population figure, make some assumptions about the age distribution of the population and then about the demand for services you would expect, given that distribution.

For example, the age distribution might be the following:

	<u>% of Total Population</u>	<u>% Male</u>	<u>% Female</u>
Under 5	20	10	10
5 to 14	30	15	15
15 to 44	35	15	20
45 to 64	13	6	7
65 and over	2	1	1

In this hypothetical case, the population estimate is 5,000. Experience tells us that children under five and women of child-bearing age (15 to 44) use health services frequently. On the basis of these figures you can begin to make detailed

estimates of the expected utilization of primary-care services. The results in this sample situation might look like this:

	<u>% of Total Population</u>	<u>Total Population</u>	<u>Estimated Visits per Year</u>	<u>Total Expected Visits per Year</u>
MALE:				
under 5	10	5,000	3	1,500
5 to 14	15	5,000	2	1,500
15 to 44	15	5,000	0.5	375
45 to 64	6	5,000	1	300
65 and over	1	5,000	2.5	<u>125</u>
				3,800
FEMALE:				
under 5	10	5,000	3	1,500
5 to 14	15	5,000	2	1,500
15 to 44	20	5,000	4	4,000
45 to 64	7	5,000	2	700
65 and over	1	5,000	3	<u>150</u>
				7,850

Another term for utilization is the total number of visits per year. Thus the results of these calculations would be:

$$\begin{array}{rcccl} \text{Expected Utilization} & & & & \\ \text{of} & = & \text{Total} & = & \\ \text{Services} & & \text{Expected} & & 11,650 \\ & & \text{Visits Per Year} & & \end{array}$$

The kind of estimate of expected utilization we have just described is based on the assumption that the capacity to provide services relevant to each population subgroup exists. To the extent that capacity is unavailable--that is, that there are not enough trained health workers--utilization will decrease. In estimating utilization, competing caregivers, both traditional and modern, must also be recognized, since, in general, people tend to consult more than one health practitioner. If other traditional and modern caregivers are not taken into account in planning, then utilization may be lower than expected.

It is also important to consider carefully whether the population in the area to be served by the health center is growing or declining, and at what estimated rate per year. These factors will affect staffing and utilization in the future.

CHECKLIST 4 suggests the types of information needed for an accurate estimate of utilization.

What Is the Schedule for Seeing Patients?

The Plan of Services should specify how many hours each day and how many days each week patients will be seen at the health center. This information affects estimates of utilization, and it may also affect how space is allocated. The number of staff members, and their responsibilities, will affect the schedule and must be considered carefully.

For example, if the health center has one full-time health worker to see patients, the center may be open five or six days each week. But the same health worker may be responsible both for seeing patients and for outreach work which takes him or her away from the center three days each week. Then, realistically, patients can be seen in the center only two or three days each week. CHECKLIST 5 suggests some questions to ask about the schedule.

What Are the Administrative Policies and Procedures of the Health Center?

It is important to specify what will be done about such issues as staff supervision, medical records, the organization of work, and receiving and storing drugs and supplies early in the planning stage. These procedures usually have significant implications for staffing patterns, scope of services, scheduling of patient visits, and allocation of space. CHECKLIST 6 suggests the type of questions about policy and procedures that need answers when you are preparing a Plan of Services.

The Plan of Services should include a description of the arrangements for receiving and storing supplies (such as dressings and paper) and drugs at the primary-care health center. These arrangements can affect staffing, the scope of services, and the design of the building. The following questions will help clarify these arrangements:

- Who is responsible for receiving and storing supplies and drugs?
- Can the necessary supplies and drugs be readily obtained? Can they be stored?
- What sorts of storage areas are needed?

CHECKLIST 7 suggests some other questions to ask about procuring and storing supplies and drugs.

What Is the Estimated Annual Cost of Operating the Planned Center?

Once a preliminary decision has been made about the basic services to be offered by the health center, their cost must be estimated. In preparing the Plan of Services, the planning and design team must consider whether the estimated operating cost can be afforded, given available sources of revenue, and how it will be met. If the proposed program of primary-care services is too expensive, the team must decide how it can be changed so it will be affordable. Obviously, the proposed cost affects all other aspects of the planned program of services. (For a discussion of operating costs, see CHAPTER 9.)

SUMMARY

The questions suggested above are only examples. Probably as many questions are omitted as are included. And some questions will be more relevant to some situations than to others. It is important, however, to consider all of the issues mentioned in this Chapter.

Answering the necessary questions requires a good deal of thought and written documentation. The answers will influence staffing, the design of the building, the extent to which the population can be served, costs, and the ultimate effectiveness of the program. In addition, the answers to these questions are important in the planning and design tasks described in the rest of this guide.

5. DESIGNING THE HEALTH CARE BUILDING: MOVING FROM
THE PLAN OF SERVICES TO THE ARCHITECTURAL PROGRAM

MAIN POINTS

THE SPACE IMPLICATIONS OF THE PLAN OF SERVICES

Staffing Patterns

Scope of Services

Patient Flow

Expected Utilization by Type of Patient

Schedule for Seeing Patients

Administrative Policies and Procedures

Referral Links to Other Health Facilities

Operating Budget

PREPARING AN ARCHITECTURAL PROGRAM

Assumptions

Functions

Relationships of Functions

Organizing Information

A Hypothetical Architectural Program

ALLOCATING SPACE

Determining Space Needs for Each Function

Planning for Movement of Patients and Staff

ISSUES AND CHOICES

SUMMARY

PREVIOUS PAGE

5. DESIGNING THE HEALTH CENTER BUILDING: MOVING FROM THE PLAN OF SERVICES TO THE ARCHITECTURAL PROGRAM

MAIN POINTS

Once the Plan of Services (the Functional Program) has been determined, an Architectural Program should be drawn up. Essentially, the Plan of Services describes who does what, when, why, how, and at what cost. The Architectural Program addresses the question "Where?" It is a direct translation of the planned activities into rooms, parts of rooms, and other spaces or areas. In the Architectural Program, square meters of floor space are allocated to particular kinds of activities, or functions.

Moving from a Plan of Services to an Architectural Program involves two steps:

- Systematically considering the space implications of the Plan of Services
- Specifying the types, sizes, numbers, and relationships of the various rooms or areas

See CHAPTERS 6 and 7 for discussions of other factors that affect space needs.

THE SPACE IMPLICATIONS OF THE PLAN OF SERVICES

In order to prepare a realistic Architectural Program, it is first necessary to specify the following in considerable detail:

- Staffing patterns
- Scope of services
- Patient flow
- Expected utilization
- Schedule for seeing patients
- Administrative policies and procedures
- Referral links
- Operating budget

PREVIOUS PAGE

These topics have been discussed in detail in CHAPTER 4.

The single most important point to remember is that all of these factors are interrelated. Once this is understood, the planning and design team can begin to examine the ways in which their Plan of Services affects the amount and kinds of space needed in the health center. The effects of each of the factors listed above will now be discussed.

Staffing Patterns

The number and responsibilities of the staff members strongly influence space needs--both right away and for the future. The smaller the staff, the more diverse their responsibilities tend to be. For example, if there is one nurse or auxiliary and one part-time doctor at the health center, the nurse or auxiliary may perform many different tasks. These tasks might include registering patients, changing dressings, diagnosing and treating simple illnesses, dispensing drugs, performing simple laboratory tests, and conducting health-education sessions. In a larger center with more staff members, each of these tasks might be performed by only one person. In a very large center, there might be several people to perform each task.

If a single person registers patients and also dispenses drugs, then these two different activities may be performed more efficiently if they are assigned separate areas within the same room. But if the health center is expected to expand, it might be better to have two adjacent rooms for these activities, with direct access in between. That way the layout will still be suitable when the center has one person for each such major activity. Remember to consider both the initial responsibilities of each staff member and his or her future responsibilities.

Here is another example of how staffing affects space needs. Suppose the doctor visits the health center one day each week. The doctor needs a room for examining patients. When the doctor is not at the health center, this room should not remain empty. Perhaps the nurse or auxiliary could use the desk in this room for record-keeping. The examination room might also be set up so that several different types of patients could be cared for, including pregnant women, patients with illnesses or injuries, or those needing immunizations.

A key consideration is that each health worker should have a distinct work area. For a small staff, there may well be more work areas than people.

Scope of Services

When listing activities in the Plan of Services, it is important to include everything--even the obvious. For example, if the health center will have a laboratory, what specific tests will be done? What equipment will be necessary? How many tests of each type will be done each day, on the average? Where will blood samples be taken? How many urine and stool specimens will be analyzed each day? Where will they be stored until they are examined?

Some other examples: Will there be a "well-baby clinic" to provide check-ups for infants? Will health and nutrition education be given to large groups? Can health education occur in the waiting area? Questions like these should have two answers: one for the first year of operation, and one for the future.

The effects of the planned services on the amount of space needed are illustrated by an example. Suppose a health center has limited laboratory services at first. That is, it has the capability to do stool and urine analyses. The patient must provide a specimen. Is this done at home or at the health center? If it is done at the health center, then toilet rooms or latrines for male and female patients should be conveniently located. In order to ensure a sense of privacy for all patients, the latrine or toilet room may be located next to or very near the laboratory area. The door to the room should not open directly into a public area. A simple window pass-through can be provided so the patient will not have to carry the specimen in public.

Another key question is what administrative tasks will be done in the laboratory. Some possibilities are recording test results in each patient's medical record and recording the numbers and results of tests in a laboratory register so utilization can be calculated. Some additional questions to be asked are:

- What type of work counters or tables are needed?
- Will a microscope be used? Where will it go? Is there a window to provide natural light for the microscope?
- Where will the laboratory supplies be stored?
- How will the reusable items be cleaned? Where will the "clean" and "dirty" areas be located in the laboratory area? Where will the sink go?
- If a white-blood count is added in the near future, where will the blood sample be taken? What equipment will be used?

These are a sample of the type of questions the planning and design team should ask for each major activity planned for the health center. The answers can be clearly communicated to all members in writing. In this way the architect will be sure to understand the requirements and wishes of the doctors and nurses. Changes can be made if necessary, and each change should also be in writing.

Patient Flow

Attention must also be given to patient flow, which means the way patients move through the health center. Different types of patients may move differently through the building. Some questions to ask are these:

- Will all patients be screened before or after registration? Will patients register only if they need treatment, or will they also register for immunizations and health education?

- Will patients come in and go out through the same door, or through different doors?
- Is the drug dispensing area the last stop in the process? Is there a full-time clerk who can dispense drugs, or is the staff so small that the receptionist dispenses drugs?

Patients may be screened, either when they register or before, and grouped according to what kind of care they need, and how urgently. Pregnant women arriving for a prenatal check-up, for instance, might be treated in a different order, or by different workers, than patients who are ill or who need immunizations. If screening is done, a place is needed for the nurse or other health worker who performs this task. This affects the way each type of patient enters the system.

As ILLUSTRATION 3 shows, most patients enter the health center, register, wait somewhere, are examined by a nurse or auxiliary or by a doctor, perhaps have laboratory tests, pick up drugs, and leave. A mother and child attending a well-baby clinic may flow through in a different sequence from someone with an illness. And a patient returning for a dressing change may enter, register, go directly to a treatment room, and leave.

The order in which different activities take place influences the way rooms or areas are arranged. The amount and patterns of movement of people, both patients and staff, from area to area is also affected by the order of activities. For example, at a well-baby clinic, many mothers and children will wait, form a line for weighing and checking, and leave. Space needs to be provided for long lines of people in order to avoid crowding. In a temperate climate, the well-baby clinic might be held outside the health center.

Here is another example of how patient flow affects the design of the health center. Women and men may prefer for cultural reasons to be separate in the public spaces. In that case, two entries, two registration desks, and two waiting areas may be needed. The female waiting area should probably be larger than that for the males, since there are usually more women than men patients.

Expected Utilization by Type of Patient

Many factors related to utilization affect how much space and what kinds of rooms or areas are needed. Here are some issues to consider:

- How many examination rooms do you need?
- How many waiting spaces do you need?
- How many laboratory tests will be performed on an average day?
- How many injections will be given on an average day? How long does each injection require, on the average?

- What is the busiest situation you anticipate? If there is an epidemic that lasts for a few weeks, that may well be the busiest situation. The health center should probably not be designed for the busiest situation. You usually design for the "average" situation, or for a slightly busier situation, rather than commit physical resources that are not regularly needed.

In a hypothetical health center, an ill baby is brought by the mother. Other children and relatives may also be present. In terms of waiting space, the actual number of people to be accommodated may be one baby plus one mother plus one grandmother plus three other children--not just the mother and baby. So an important question is: How many people will the waiting area need to hold in addition to the patient and one family member?

In this example, suppose there are 40 visits each day. If half of the average daily visits (half of 40, or 20) are children with mothers, then the number of people coming to the health center is 20 children (the patients) plus 20 mothers plus other family members. This is quite a crowd of people, particularly if they all come at the same time.

The next question is: How many of these people will go into the examination room? In some cultures, it is important for everyone to stay together, so the actual number of people in the examination room may be five people plus the nurse, auxiliary, or doctor. Because a room which must hold six people needs to be larger than a room for three people, the number in the examination room influences space needs.

Schedule for Seeing Patients

Once assumptions are made about the average number of visits to each staff member (doctor, midwife, nurse or auxiliary, or other health worker) per hour per day, then the implications of these assumptions for space needs must be considered. For example, one doctor may see one patient for five minutes, another patient for seven minutes, and a third patient for three minutes. The average time the doctor spends with each of these patients is five minutes. A midwife may spend an average of 15 to 20 minutes with each patient. It may take a nurse or auxiliary an average of two or three minutes to immunize one patient.

The average times in this example are important in deciding how many examination rooms are needed. If the doctor, midwife, and nurse or auxiliary all work at the same time each day, three or more examination rooms may be needed. If they work on different days or at different times, that number may change.

The way such calculations are made can be seen in an example. Assume the doctor sees patients for four hours each day and spends an average of five minutes with each patient. The total number of patients the doctor sees in a day is:

42 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

$$4 \text{ hours} \times 12 \text{ visits/hour} = 48 \text{ visits/day}$$

If the doctor spends only two hours seeing patients, then the average number of visits is:

$$2 \text{ hours} \times 12 \text{ visits/hour} = 24 \text{ visits/day}$$

If the examination room is set up to accommodate patients seeing the doctor and pregnant women seeing the midwife, and if the midwife sees patients during a different two-hour period than the doctor, then the examination room can be shared by these two staff members. In this case, it may be possible to manage with one examination room rather than two.

In a two-hour period, the doctor in this example sees 24 patients. Typically, the midwife spends more time with each patient. If she averages 15 minutes for each visit, then she will see four patients each hour. The number of patients she sees in a two hour period is:

$$2 \text{ hours} \times 4 \text{ visits/hour} = 8 \text{ visits/day}$$

If the center is open six hours a day and the midwife sees patients for six hours, then the number of patients she sees in a day is:

$$6 \text{ hours} \times 4 \text{ visits/hour} = 24 \text{ visits/day}$$

Scheduling patient visits and assigning the use of rooms to different staff members does not ensure that everyone who needs care will receive it. In the hypothetical case just described, there may be 75 patients who want to see the midwife each week. That is, there is estimated patient demand for 75 visits a week.

But the midwife is available to come to the center only two days each week, for a total of 48 visits a week. In this situation, demand for services is not being met. There is no problem with the design of the building or the number of examination rooms. But there is a problem with availability of staff.

Administrative Policies and Procedures

Also important are the space requirements of activities related to administering and operating the health center. One important part of administering the health center is receiving and storing supplies and drugs. Here are some questions to ask:

- How frequently are supplies received? What quantity of supplies tends to be delivered at one time?
- How much storage is needed? Can the items be kept in boxes on shelves, or do they need special conditions such as a refrigerator, a sterile environment, a cool place, a dry place?

- How are new supplies ordered?
- Who keeps track of what items are consumed or used?

Another important area is record-keeping. Here are some sample questions to ask:

- Are records kept of what supplies are used?
- What type and size of medical records are used?
- Are births and deaths registered at the health center? Are other types of statistics gathered there?
- Will disease reporting take place at the health center?
- Will records be made each day or less frequently? Will an office be needed for recording statistical information?

The planning and design team should be aware of administrative policies that may affect how much space is needed. For example, the health center might decide that no more than two family members may accompany each patient into the health center. The number of waiting spaces would then be reduced accordingly.

Referral Links to Other Health Facilities

The Plan of Services should specify how the patient moves from the primary-care health center to another health facility, perhaps a hospital. The space implications of these decisions must then be considered.

If the patient needs care while waiting to be moved, there should be a place in the health center for this care to be given. Should this room or area be private or isolated? How frequently does this situation occur? How long is the patient likely to have to wait? How far away is the facility that provides the next level of care? Is a vehicle used in transporting the patient? Where is the vehicle kept when not in use?

CHAPTER 8 discusses the issue of beds at a health center. The more remote the primary-care center is from other health-care resources, the more important it is to compensate for the difficulty of access.

Operating Budget

At this point, the planning and design team should pause and ask a question: Can the Plan of Services be afforded? If realistic estimates of revenues cannot cover estimated costs of operation year after year, then the scope of services and staffing must be reduced.

The Plan of Services should also specify the amount and sources of money expected to be available for construction. This will guide the architect as he moves from Plan of Services to the Architectural Program and then to preliminary drawings. It will also facilitate the development of final building designs that can be afforded.

PREPARING AN ARCHITECTURAL PROGRAM

The Architectural Program is derived directly from the Plan of Services (Functional Program) and translates planned activities into rooms, parts of rooms, and other spaces and areas. The Architectural Program is the narrative link between the Plan of Services and preliminary drawings. In preparing an Architectural Program as outlined in this chapter, there are several interrelated steps:

- Review the Plan of Services, particularly the assumptions about:
 - Population
 - Services
 - Utilization
 - Staffing
 - Costs
- Determine major functions (such as entry and waiting, registration, and examination).
- Group functions by category or type of use (clinical, clinical support, administrative, and non-clinical support functions), by the type of user, and by the amount of privacy needed.
- Organize information and prepare a written Architectural Program.

The Architectural Program should be prepared before work is begun on designing the new building or renovation. The example described below illustrates how assumptions can be used in preparing the Architectural Program.

Assumptions

Assume that a Plan of Services (Functional Program) has been prepared for a small primary-care health center serving 2,500 to 3,000 people. The one full-time nurse or auxiliary will be joined by a doctor and a midwife, each working on a different full day. A traveling team will work out of the health center and will need to store well-testing equipment and chemicals. They will also need showers. The nurse will be responsible for many different tasks,

including registering patients, dispensing drugs, diagnosing and treating simple illnesses, providing first aid, doing some simple laboratory tests, and holding health-education sessions.

Functions

The assumptions described above can then be listed in terms of major functions or activities. Note that functions are not the same as rooms. There will not necessarily be one room for each activity or function. The major functions to be considered are:

- Entry and waiting
- Registration and medical records
- Examination
- Treatment and first aid
- Immunization
- Drug dispensing and storage
- Laboratory
- Sterilization
- Health education
- Patient toilet or latrine
- Staff toilet or latrine and shower
- General storage
- Janitor's supply closet

Relationships of Functions

There are three common ways to look at how the different functions relate to one another. In each of these ways, functions are grouped together so the functions which should take place next to or near each other can be easily identified. The three ways of grouping functions are by the type of use or activity, the type of person who will use them (type of "user"), and the amount of privacy required. The functions are listed in all three ways below:

- Functions grouped by type of use
 - Clinical functions: functions that involve direct patient care (such as examination and treatment)

- Clinical support functions: functions that are important to direct patient care but do not involve it (such as laboratory, drug dispensing, and sterilization)
- Administrative functions: functions that keep the health center running smoothly (such as registration and medical records)
- Non-clinical support functions: functions that do not relate to direct patient care (such as waiting and storage)
- Functions grouped by who uses them
 - Functions involving patients only, or patients and family members (such as waiting)
 - Functions involving patients and staff (such as registration and examination)
 - Functions involving staff only (such as laboratory)
- Functions grouped by how much privacy is required
 - Totally private (such as toilets and areas for changing clothes)
 - Semi-private (such as examination and taking a blood sample)
 - Public (such as waiting, health education, corridors, pharmacy window)

Now informed decisions can begin to be made about which functions require separate rooms, which functions can be assigned areas within a room or other space, and which functions can occur in the same room or area at different times. These decisions form the basis of the Architectural Program.

Organizing Information

There is no single best way to organize the information necessary to prepare an Architectural Program. In addition to the Plan of Services, the Architectural Program is based on the space requirements, judgments, and preferences of the various staff members. The importance of gathering and organizing this information in a systematic way cannot be overemphasized.

It is crucial to ask for and record information in detail. The sample below deals with only one combined function (registration and drug dispensing). The same questions should be asked for every function. (See TABLE I for a sample format for the Architectural Program.)

Sample of Information for Combined Functions

- Name of Function: Registration and drug dispensing combined.

TABLE I

SAMPLE FORMAT FOR AN ARCHITECTURAL PROGRAM

For each major room or functional area, it is useful to identify the following types of information before design decisions are made. As changes are made in the Plan of Services, the Architectural Program should be revised accordingly.

NAME OF FUNCTION:

For example, registration.

TYPES OF USERS:

List by type and numbers involved.

MAJOR ACTIVITIES:

List the chief functions, tasks or activities that need to be accommodated in this area.

PROXIMITY AND ACCESS:

Determine the other areas that this room directly relates to, needs to be next to or near.

SPECIAL REQUIREMENTS:

Include such requirements as

- Ventilation (natural and artificial)
- Lighting (natural and artificial)
- Sanitary systems (sinks, toilets)
- Electrical (coordinate with equipment and furnishings)
- Finishes for walls, floor, ceiling
- Windows (screens, glass, sun-control devices)

MAJOR FURNISHINGS AND EQUIPMENT

List by type. Include size and special requirements. Indicate if item will be built-in or moveable.

- Types of Users: One receptionist who also dispenses drugs (this person may be a nurse or a clerk) and one patient and family members.
- Major Activities: Register patients, file medical records, dispense drugs, record data on drugs dispensed.
- Proximity and Access: Direct access from entrance and to waiting area. Convenient access to examination rooms and the rest of the health center.
- Special Requirements: Provide two separate counters--one for registration and one for dispensing drugs. Provide natural light and natural ventilation.
- Major Furnishings and Equipment: Cabinet for drug storage, file for medical records, desks, and chairs.

A Hypothetical Architectural Program

In an Architectural Program, some functions might be combined--as in the sample just described--and others might be assigned to rooms with only one purpose. In the hypothetical Architectural Program we have been describing, the functions are grouped according to the type of activity they involve:

- Clinical Functions
 - Examination
 - Treatment and first aid
 - Immunization
 - Health education
- Clinical Support Functions
 - Drug dispensing and storage
 - Laboratory
 - Sterilization
- Administrative Functions
 - Registration and medical records
 - General storage
- Non-Clinical Support Functions
 - Entry and waiting

- Patient toilet or latrine
- Staff toilet or latrine and shower
- Janitor's supply closet

An Architectural Program for this health center might allocate space as follows:

- One covered entry with outdoor waiting area combined with health education
- One area or work station for registration and medical records in the same room as drug dispensing and storage and small laboratory
- One examination room
- One room for treatment and first aid and immunization, with a sterilization area
- One general storage room
- One janitor's supply closet
- Plus staff toilets, patient toilets, and showers

In this hypothetical situation, the major functions (not including toilets and showers) are assigned to:

- Three single-purpose rooms: examination, general storage and janitor's supply closet
- One multi-purpose room: treatment and first aid, immunization, and sterilization
- One multi-purpose room with three separate work stations for registration, drug dispensing and drug storage, and laboratory
- One covered outdoor area combining waiting and health education

This illustration may, of course, be inappropriate for a variety of situations. But the process of thinking through space needs and exploring assumptions would be the same in any situation. Past experience should not be the only guide in preparing the Architectural Program.

It is necessary to make a detailed description of all the requirements of each planned room or area. Gathering this information in a systematic way is useful. It also allows the team to allocate space to that room or area based on realistic information and not only on guesswork. A final task in preparing a

preliminary plan for the building is to connect the various rooms or areas by means of "traffic routes," or areas designed for the movement of patients and staff. These may be corridors, hallways, courtyards, or verandas.

ALLOCATING SPACE

Simply stated, allocating space means determining how much space (or area) is required for each planned function. Allocating space makes it possible to estimate the overall size of the health center. There are two types of areas that need to be determined: the net area in square meters (m^2) or square feet (ft^2), and the gross area in m^2 or ft^2 . These terms are defined below.

- Net Area. The net area for each room or function is the amount of usable space assigned to it. In other words, the net area is the amount of space judged to be necessary (or desirable) for each function.
- Gross Area. The gross area of a health center is the total size of the building. If the outside dimensions of a rectangular building are 10 meters by 20 meters, for example, then the gross area is $200 m^2$. (See TABLE 2 for a guide to estimating the gross area of a building.)

As the health center is planned, and as decisions are made and information becomes more precise, the actual dimensions of rooms and of the building will become more accurate. For this reason the gross area will vary somewhat between the size estimated in the planning stage and the size actually specified on the final drawings used in construction.

Determining Space Needs for Each Function

Although other factors influence the size of the building (see CHAPTERS 6 and 7), we focus here on the functions planned for the health center.

The first step in allocating space is to consider the effects of the planned functions (such as examination or storage) on the amount of space to be built, and whether multi-purpose spaces can be used (for example, an examination room combined with an area for sterilization or drug storage).

Before beginning to design a health center, the planning and design team needs to agree on a final Architectural Program that describes specifically the types, sizes, numbers, and relationships of the various rooms and areas. The specific amount of space needed will depend on the following factors:

- The activities that occur in each room or area
- The number of people who use the room or area
- The equipment or furnishings
- How much privacy is required (visual and acoustical)

TABLE 2

ESTIMATING THE SIZE OF THE BUILDING: AN EXAMPLE

ROOM OR AREA	SPACE NEEDED (square meters)
1 examination room	10 to 12 m ²
1 treatment room	12 to 14 m ²
1 office and storage area for health and nutrition educator	8 to 10 m ²
1 office and storage area for outreach workers	8 to 10 m ²
1 laboratory and drug dispensing area combined	10 to 12 m ²
1 registration and administration area	10 to 12 m ²
1 waiting area, which doubles as a health education area (the assumption is that two people arrive with each patient)	24 to 30 m ²
NET USABLE SPACE	<hr/> 82 to 100 m ²

Assume 50% for toilets, general storage, walls, areas for movement of staff and patients, and partitions. Note that this 50% factor varies considerably with the type of construction and amount of space allocated to circulation.

$$0.50 \times 82 \text{ to } 100 \text{ m}^2 = \underline{\hspace{2cm}} 41 \text{ to } 50 \text{ m}^2$$

ESTIMATED GROSS AREA (404 to 492 ft²) or 123 to 150 m²

- What specific function should be next to, close to, or away from others
- The influence of customs and traditions
- The preferences of users
- The opinions of planners

An examination room is a typical space for which there is no single correct size. It may vary between roughly 8 m² (85 ft²) and 14 m² (150 ft²). Questions that directly affect how much space is needed in an examination room are:

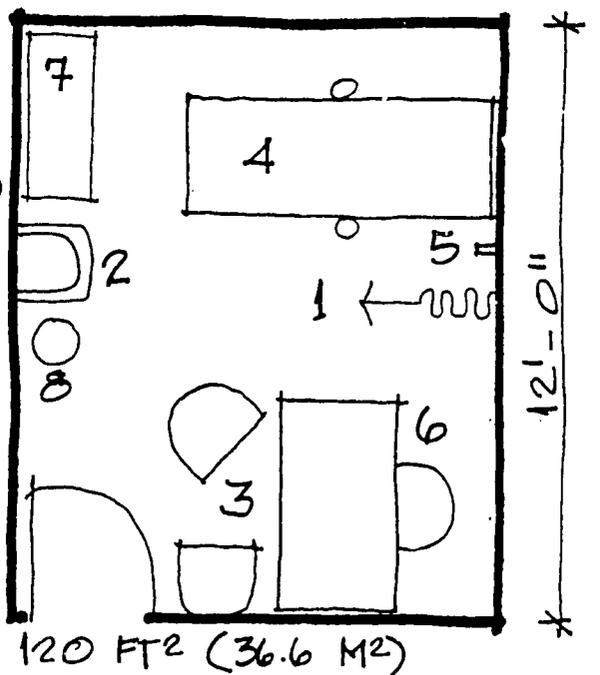
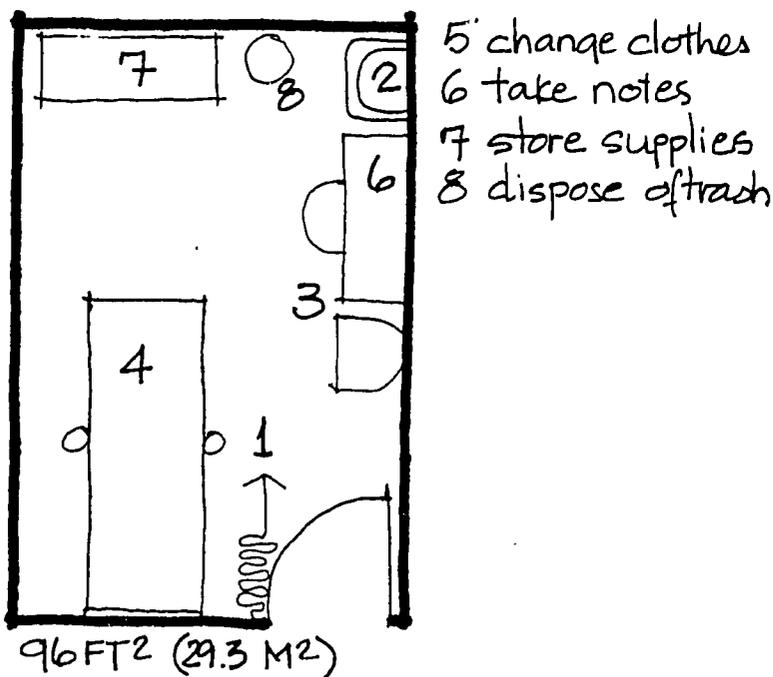
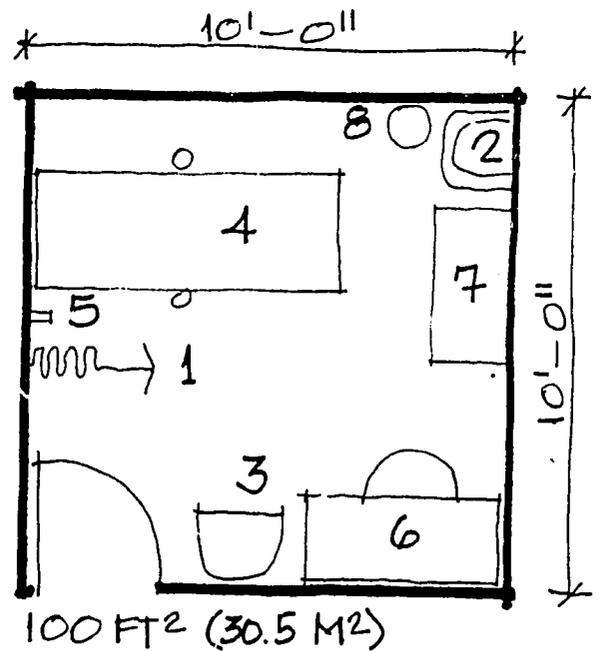
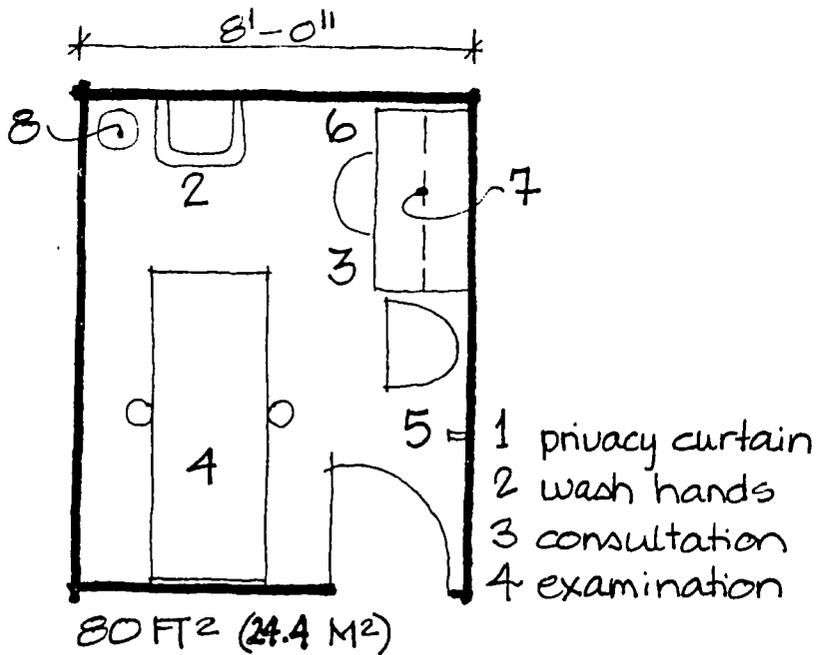
- How many family members typically accompany the patient into the examination room?
- Does the patient usually undress in the examination room or in a separate changing room?
- Do the patients usually come in one door and go out through the same door, or through two different doors?
- Where does the doctor typically sit to take notes during a patient visit?
- Is the examination room assigned to one person, or is it used by several staff members?
- What kinds of furniture and equipment are required?
- What other purposes is the examination room likely to be used for?
- What type of electrical and plumbing fixtures are required?
- Is there a sink in each examination room, or are sinks shared between examination rooms?
- Is the examination room also used as an office? Is there a desk and chair for consultation and administrative tasks?
- Is minimizing space more important than having a room of the typical current size for an examination room?
- Is a doctor's status reflected in being assigned a larger examination room than a midwife's examination room?

ILLUSTRATION 4 gives an example of alternative layouts for an examination room.

ILLUSTRATION 4

ALLOCATING SPACE BY FUNCTION

These four sketches show in plan view the same functions in different size rooms. The major activities that occur in an examination room are indicated by numbers 1 through 8.



Planning for Movement of Patients and Staff

One of the most frequent problems that can be partly solved by careful planning and design is inefficient movement of staff members, patients, and visitors in and out of the health center and from one area to another within the center. Clearly, the more people there are, the greater the potential problems of crowding and confusion. So good movement patterns or areas can move people efficiently and avoid problems of crowding and confusion.

Areas for movement include both indoor and outdoor spaces such as corridors, hallways, porches, verandas, patios, covered walkways, and sometimes rooms or areas like the waiting area. These areas connect the rooms or other areas. They are essentially places for people in transition.

Crowding is most likely to occur at the registration area and at the drug dispensing area. If patients are registered and drugs are dispensed at or near the same place, then it may be wise to provide a wider-than-normal hallway or distinct areas where lines of people can wait.

Decisions about areas for the movement of patients and others may depend directly on the decisions made about patient flow. For example, if patients returning for follow-up care such as dressing changes do not register, then it may be wise to locate a dressing-change area which can be entered directly from outside or from the main door. There may also need to be a separate waiting area. Or if immunizations are done on a particular day, then patients coming only for immunizations may move differently from other patients.

ISSUES AND CHOICES

To prepare a complete Architectural Program, it is not enough to add up the amount of space needed for each function or major activity and use that total for the amount of space needed. In addition to totalling the estimated net areas needed for each function, there is another practical way to consider how much space should actually be allocated.

Many different primary-care functions can occur in an area or room that is 10 to 12m². Some examples are an examination or treatment room, a doctor's office, an office and storage for outreach workers, a laboratory, a drug dispensing area, and an office for the health and nutrition educator. The goal is simply to avoid spaces that are too big or too small and yet to allow for some degree of flexibility in the use of planned spaces.

For example, functions to be included in the immediate program of services may suggest that only 9 m² are needed. But by adding one more square meter of space you may acquire a great deal of flexibility for years to come without building a room that is too big for its initial purpose.

SUMMARY

The Architectural Program results from a consideration of the space implications of the Plan of Services. It translates to main activities, or functions, involved in providing primary-care health services into rooms, part of rooms, and areas. The spaces needed depend on the activities planned, the estimated staff, equipment, need for privacy, the climate, the customs, and the amount of flexibility you want to allow.

6. OTHER PLANNING CONSIDERATIONS

MAIN POINTS

SITE SELECTION AND PLANNING

Selecting the Site

Planning the Use of the Site

SANITARY PLANNING

Water Supply and Drainage

Refuse Disposal

Human Waste Disposal

Personal Hygiene and Sanitation

Draining of Surface Water

RENOVATION OR NEW CONSTRUCTION?

STANDARD DESIGNS

PLANNING FOR DRUG STORAGE

PLANNING FOR OPERATION AND MAINTENANCE

PREVIOUS PAGE BLANK

6. OTHER PLANNING CONSIDERATIONS

MAIN POINTS

Several other factors should be considered before the design of the health center is begun. With rare exceptions, these factors should be considered during the planning process, at the same time as the Plan of Services is prepared and its effect on space needs is examined. Each factor is treated separately in this Chapter, although they are interrelated. The order in which these planning considerations are discussed does not reflect their relative importance or the order in which they should be dealt with.

SITE SELECTION AND PLANNING

The criteria used in selecting a site are similar to the factors that should be considered in planning how to use the site.

Selecting the Site

The approximate size of the health center must be determined before a site is selected. Therefore the final site should be selected after the Architectural Program is prepared. There are several things to consider in selecting a piece of land for a primary-care health center:

- The availability of water (preferably year-round)
- The size and shape of the site
- The orientation of the site (north, south, east, west)
- The cost of acquiring the site
- The availability and ownership of the site
- Current or planned roads nearby
- Closeness to a village or community center (market or school)
- Ease of access for the population to be served
- The types of soil (especially strength and drainage characteristics)
- The slope, topography, and terrain

1959

- The availability of electricity
- Potential methods of waste disposal
- Cultural factors that may adversely affect utilization (for example, a site near a burial ground)
- The risk of floods or earthquakes
- The vegetation, trees, and plantings
- The amount of room for expansion

Planning the Use of the Site

Planning how the site will be used is similar to planning the spaces needed in a building. Just as the building is described in a written document, the Architectural Program, before design begins, the site requirements should be listed on paper. Here are some samples of the kind of question that will help the planning and design team understand what activities the site must accommodate.

- Who uses the site? Consider patients, family members, nurses or auxiliaries, doctors, midwives, people delivering supplies, ambulance drivers, outreach workers, and others.
- How will the different types of users gain access to the site? Will everyone enter at a single point?
- Where will people park bicycles and other vehicles such as an ambulance?
- What direction will the front of the building face? Is this orientation compatible with requirements for cross-ventilation or protection from excessive heat?
- Where will the latrines, septic tank, or other sanitary facilities go?
- Where is the source of water?
- Will there be housing for nurses or auxiliaries, midwives, or doctors at the site?
- Will the site be enclosed by a compound wall, by a fence, or by rows of trees?
- What are the traffic routes for pedestrians, vehicles, and bicycles?

The answers to questions like these will help shape the layout for the site. Early in the design stage, alternative layouts for the site may be studied. One of these plans will then be selected by the team and developed into a final site plan by the architect or engineer. This final drawing should show:

- Compass points (where is north?)
- Direction of prevailing winds
- Property boundaries
- Scale
- Topography and contour lines
- Existing trees, rock outcroppings, streams, and other bodies of water
- Structures already on or adjacent to the site
- Roadways, paths, walkways
- Direction to the nearest village or community center
- Traffic routes for vehicles and people on the site
- Parking and delivery areas
- Outline of the proposed building
- Direction of future expansion
- Locations of latrines
- Location of well
- Covered walkways connecting pavilions
- Drainage of surface water

Planning how to use the site is important even for a small primary-care center. The site plan drawing establishes the basis for both current and future development. It should show all current and possible future elements.

SANITARY PLANNING

Sanitary planning is only the first step toward preventing public-health problems. Sensible design, good construction, adequate maintenance, and correct use are equally important. An appropriate sanitation system is one that can be built locally, maintained safely, and used correctly. It has the following components:

- Water supply and drainage
- Refuse disposal

- Human waste disposal
- Personal hygiene and sanitation
- Drainage of surface water

A health center has a particular responsibility to demonstrate "healthy" and appropriate approaches to sanitation.

Water Supply and Drainage

Without a year-round supply of water a primary-care health center cannot function. There is no single best way to ensure a safe water supply in all the different rural areas where no piped water supply exists. For example, water may be brought in during the dry season, or it may be collected and stored during the rainy season. The following questions spotlight important issues the planning and design team should consider:

- What are the sources of water? If the health center will use water from a well, does it already exist, or must it be dug? Will water come from a cistern, or storage tank? Where will it be located? Is there a piped water system? Will a combination of water sources be used?
- If a well will be used, how deep is it? Does it depend on a shallow underground water table? Is it protected from contamination by seepage?
- If a hand-dug well will be used, is it covered to protect it from direct contamination and to protect users from falling in?
- Will rain water be collected and stored? How will it be protected from possible contamination?
- How will water be tested for contamination? Who will do the testing?
- How will water be purified?
- Will water be fed into the center by gravity? Will a pump be used? An electric pump, or a hand pump? Can the pump be replaced or repaired easily?
- Where does waste water go?

Refuse Disposal

Refuse disposal means getting rid of trash, debris, used bandages and dressings--anything that cannot be reused. One important consideration is to plan for temporary storage and then permanent disposal of contaminated or hazardous items. For example, to prevent the spread of infection, used dressings should be temporarily stored in a trash container and then permanently disposed

of at the end of the day. The control of insects and rodents should be part of the plan for refuse disposal.

Human Waste Disposal

Disposing of human waste in a safe and adequate manner is often a complex problem. Careful and realistic planning for a pit latrine, a Turkish toilet (a squat plate over a pit latrine or with a water-flood system), or a septic tank system is crucial. For example a WC (water closet or toilet) should not be installed if water is scarce, if parts are not available locally, or if no one in the area can repair the WC. A broken WC is useless. So is a working WC that is totally foreign to the users. If a Turkish toilet is an acceptable system culturally, then it should be considered rather than the Western WC system.

The type of waste-disposal system selected will depend upon technical, cultural, and environmental considerations.

- Technical considerations include choosing a safe system that can be purchased, installed, and repaired locally. If water is part of the system, water must be available year-round.
- Cultural considerations include selecting a system that is acceptable to the users. Education may be helpful if an unfamiliar system is chosen.
- Environmental considerations are particularly relevant but not limited to the design, maintenance, and use of a pit latrine or septic tank. Systems that are open or located improperly can be hazardous. Issues to be considered include the following:
 - The condition of the soils should permit drainage.
 - The system should not be close to a shallow well used as a water source.
 - A pit latrine should be located downwind from the health center.
 - There must be protection from insects and rodents.
 - Seepage from tanks must be controlled.
 - Repair and replacement should not be difficult.

Personal Hygiene and Sanitation

Design considerations related to facilities for personal hygiene and sanitation (washing, bathing, and use of toilets) include:

- Providing a source of water near the latrines
- Providing a place for staff members to wash their hands after examining and treating patients

- Providing ways to educate patients in personal hygiene
- Providing showers for staff members and traveling health workers

Draining of Surface Water

Attention should be given to preventing the accumulation of water in or near the building, on walkways, and on the site. Issues include the following:

- Soils should drain well.
- The site selected should have a slope.
- The building should be placed uphill.
- Run-off of water should be guided by grading the site and with plants.
- A means of surface and subsurface drainage should be provided.

RENOVATION OR NEW CONSTRUCTION?

Whenever possible, the planning and design team should consider reusing existing buildings. When resources are limited, it is often best to make use of existing buildings--particularly if few changes need to be made to accommodate a primary-care health center.

Deciding between renovating an existing building and constructing a new one requires weighing the advantages and disadvantages of each option. For example, with new construction there is great freedom. The building can be designed in a way that fits the site and the budget. Less freedom is possible when an existing building is renovated or expanded.

But it is frequently less expensive to renovate than to construct a new building. It may also be more practical. Travel patterns may already have been established to and from an existing building. With a new building, there is always some risk that the new location will be unacceptable to potential patients. Before deciding whether to renovate, expand, or build new construction, the planning and design team should consider the following questions and issues:

- What are the Plan of Services and the Architectural Program for the health center? It is essential to have a good idea of the types of services planned for right away and for the future, the planned rooms or areas, the net usable space required for each of them, and the requirements for the site.
- What are the available existing buildings like? What is their age, size, condition, and structure? CHECKLIST 9 serves as a guide to evaluating an existing building.

- How do the cost estimates for a new building compare with the estimates for renovation or expansion? For an existing building, be sure to include the costs of purchasing it, demolishing a part, and making other structural changes, in addition to the costs of fixing it up.
- Where is the existing building? Is it within a reasonable distance from potential patients? What types of other buildings or services are nearby?
- How much renovation is anticipated? There are three general levels of renovation:
 - Minimal renovation means painting and cleaning up the building. No alterations are made to walls, floors, or ceilings. The basic layout of the rooms is not changed. The functions assigned to rooms may or may not change.
 - Moderate renovation means making some changes, but not extensive changes. Few sinks may be added, for instance, and a wall or two may be changed. Functions may or may not change.
 - Major renovation means extensive changes in walls, ceilings, or floors. The electrical and plumbing systems are usually altered, and the functions assigned to rooms are likely to change.
- Is the existing building obsolete in one or more ways? Is it difficult or costly to overcome that obsolescence? The main types of obsolescence are these:
 - Functional obsolescence occurs when there is a disparity between the original purpose of the building and its current use. For example, the building to be used for a health center may have been a school.
 - Physical obsolescence occurs when the building becomes old and the materials or systems wear out.
 - Economic obsolescence occurs when it costs less to replace the building than to repair and maintain it.
 - Locational obsolescence occurs when some or all of the building is no longer used.
 - Catastrophic obsolescence occurs when a useless structure remains after a disaster, such as an earthquake, flood or fire.
 - Symbolic or aesthetic obsolescence occurs when the image or appearance of the building is no longer appropriate.
- What is the potential for expansion? How flexible is the existing building?

- What is the estimated total cost of using an existing building? Be sure to consider these elements:
 - Estimated replacement costs
 - Estimated renovation costs
 - Estimated expansion costs
 - Estimated demolition costs
 - Estimated operating costs
- If the existing building is already a health-care center, can services be provided during renovation?

CHECKLIST 9 can be used a guide in evaluating an existing building.

STANDARD DESIGNS

When technical and material resources are limited, it may be tempting to use a single design for health centers in many different loations. Using a standard design can be a good idea--particularly if the building is relatively simple and the basic program of services is the same in each location.

But there are some disadvantages. Standard designs are not necessarily the most economical for non-standard situations. To be used effectively, standard designs must be adapted to the particular health-care services to be provided and to local variations in climate, culture, materials, and labor supply.

If it is considered important to use a standard design, then more than one design should probably be prepared to allow for differences among the various regions. For example, perhaps stone and brick are the two main local materials used in a region or country, the climate is hot-dry, and the customs and traditions are similar throughout the area. In that case, two sets of drawings should be prepared, one for a stone building and one for a brick building. Except for the building materials, the two designs would be the same.

PLANNING FOR DRUG STORAGE

Careful attention should be given to the transport and storage of drugs, particularly in hot-dry or hot-humid climates. Some drugs must be refrigerated, and space and equipment must be provided for this purpose. Even for drugs that do not require refrigeration, the temperature of the storage area can affect the useful life and potency of certain drugs.

High temperatures can damage drugs that do not require refrigeration (most tablets, powders, capsules, and liquids). An unventilated storage room with a tin

roof or a cabinet in tropical areas can easily reach temperatures above 48° C (120° F), particularly toward the ceiling. Such temperatures speed up the deterioration of many drugs. Some ways to lower temperatures, or prevent temperatures from rising, and thus to keep drugs from deteriorating are listed below:

- Store drugs on the north side of the building when the health center is north of the equator, or on the south side of the building when it is south of the equator.
- Plan a double tin roof with an air space of 10 to 20 centimeters (4 to 8 inches) between the layers of tin for the drug storage area.
- If possible, keep air circulating--preferably through natural cross-ventilation. A small air inlet and larger outlet will encourage more air flow.
- Store drugs from just about floor level to chest height. Use higher shelves for linens, glassware, bandages, and other items not affected by heat.

PLANNING FOR OPERATION AND MAINTENANCE

Regardless of the size of the health center, it is important to have an organized approach to upkeep, cleaning, and maintenance. In order to control infection, for example, there should be a plan for the disposal of dressings and for cleaning the treatment area. If electricity is available, it is wise to have extra lightbulbs for examination lamps and general-purpose lighting fixtures. Planning for maintenance involves thinking about painting, replacing broken screens or windows, and generally keeping the health center clean and in working order.

To determine what supplies, administrative procedures, space, and staff members will be necessary for normal operation, repair, and maintenance, look again at the Plan of Services. Whenever something must be done to keep each activity progressing smoothly, make a note of it. Then make sure the necessary items are included in the Plan of Services, the Architectural Program, and--most important--the operating budget.

7. FACTORS AFFECTING THE BUILDING DESIGN

MAIN POINTS

THE DESIGN STAGE

PLANNED ACTIVITIES

CLIMATE AND ENVIRONMENT

Solar Radiation and Temperature

Relative Humidity

Prevailing Winds

Precipitation

Effects of Climate on Design

SITE AND TOPOGRAPHY

TRADITIONS AND CULTURE

MATERIALS AND CONSTRUCTION METHODS

FLEXIBILITY AND EXPANSION

BUILDING CODES, STANDARDS, AND GUIDELINES

BUDGETARY CONSTRAINTS

SUMMARY

PREVIOUS PAGE BLANK

7. FACTORS AFFECTING THE BUILDING DESIGN

MAIN POINTS

This section highlights factors that affect the decisions made about the design of the health center. These factors include:

- Planned activities
- Climate and environment
- Site and topography
- Traditions and culture
- Materials and construction methods
- Flexibility and expansion
- Building codes, standards, and guidelines
- Budgetary constraints

It cannot be said too often that these factors are interrelated. Sometimes planners will have to make choices or trade-offs between them; some factors will be more important than others. ILLUSTRATION 1 demonstrates how the same primary-care health program might be accommodated in dramatically different buildings when different climate, customs, and local construction materials are taken into account.

Other factors can also influence design. You may find that additional factors are important for your particular project. Be sure to add them to the list and consider how they affect the design.

THE DESIGN STAGE

The Architectural Program translates the Plan of Services into specific rooms or areas needed for particular activities. In the same way, the design process translates the Architectural Program into drawings that show what the health center building will look like physically.

The design stage has two main parts. In the early design stage, preliminary drawings or layouts are prepared that give a general idea of the planned

building. In the later design stage, working drawings and specifications to be used in constructing the building are prepared.

All through the design stage, the decisions made by the architects or engineers must be reviewed and approved by the agency or organization that is responsible for the operation of the health center.

PLANNED ACTIVITIES

The activities planned for the health center, listed in the Plan of Services, affect the sizes and relationships of the various rooms and areas, the type of lighting needed, the amount of privacy needed, the location of sinks and doorways, the types of wall and floor finishes, and other aspects of the design. CHAPTERS 4, 5, and 6 discuss ways of determining the necessary functions and their effects on the spaces needed.

CLIMATE AND ENVIRONMENT

Climate is the combined effect of many interconnected elements, which may vary by season or even from day to day. The main elements of climate are:

- Solar radiation
- Temperature
- Humidity
- Prevailing winds
- Precipitation

The influence of climate on design is particularly obvious in buildings constructed with traditional local materials. Frequently these buildings have been designed not by architects but by local people intimately aware of the climatic conditions in which they live. Given today's limited resources, design that is responsive to the local climate is essential.

Adapting the design of the primary-care health center to the local climate and environment is important to the physical and psychological comfort of the people who work in and visit the health center. In order to do this, the planning and design team must know which aspects of a climate are most troublesome and how the building can minimize undesirable effects.

Most developing countries have tropical or subtropical climates and lie within the hot-humid, hot-dry, and temperate climate zones (the different types of climate are explained later in this Chapter). Some countries have more than one kind of climate. If you are planning health centers for several locations, it

is important to check the climate for each site. CHECKLIST 10 can be used as a guide. Instead of one standard design, it may be necessary to prepare two or three variations if there are two or three climates.

Solar Radiation and Temperature

The intensity and amount of solar radiation (or sunlight) depends on the sun's altitude above the horizon. This is a function of season and of the latitude of the site--that is, how far north or south of the equator it is. Temperatures can be grouped into five ranges:

- cold: below 10° C (50° F)
- cool: 10° to 15° C (50° to 60° F)
- temperate: 15° to 30° C (60° to 86° F)
- hot: 30° to 38° C (86° to 100° F)
- very hot: above 38° C (100° F)

Relative Humidity

Relative humidity (shown as a percentage) is the ratio of the amount of water vapor in the air to the maximum amount of water the air can hold at the prevailing temperature and air pressure. The ranges of relative humidity are:

- very dry: 0% to 25%
- dry: 25% to 50%
- humid: 50% to 75%
- very humid: 75% to 100%

People feel comfortable (not too cool and not too hot) when the temperature is between 22.5° and 29° C (72° and 84° F) and when the relative humidity is 20% to 50%. These are the usual conditions in a temperate-dry climate.

Prevailing Winds

Prevailing winds are described by their duration, direction, and speed. Prevailing winds may vary daily or seasonally. In hot-humid climates the wind can be used for ventilation by orienting the long axis of the building perpendicular to the direction of the prevailing wind during the hot season. This will maximize cross-ventilation. Protection from high winds is also important.

Precipitation

Precipitation is rain or snow, which may be described in terms of how much is accumulated in a day, a month, a season, or a year. Precipitation

influences both temperature and relative humidity. With precipitation come problems of drainage and protection for buildings from water and moisture.

Effects of Climate on Design

These elements combine to produce a general climate for a large area or region, which is called the "macroclimate." A specific building site may have its own characteristic climate, called the "microclimate," which varies from the macroclimate. There are five main types of climate, and each poses particular problems for building design:

- cool
- temperate
- hot-dry
- hot-humid
- warm-humid

The climate should influence the shape of the building, its orientation, the type of materials used for walls and roof, the exterior color, the location of windows and doors--in short, the overall design of the health center. Some examples of the effect of climate on the design of a health center are described below.

- Cool climates in the tropics are often in hilly areas. The main problem is to capture the daytime heat and conserve it for the night. Some ways to do this are:
 - Place the long sides of the building so they face north and south to assure maximum heating of the building by the sun.
 - Select a compact building shape with few openings.
 - Locate openings to the sun to allow the sunlight to enter and warm the space.
 - Allow walls and roof to capture and store heat.It is also important to provide adequate ventilation if open fires are used at night for heating.
- Temperate climates are moderate and comfortable. They present no particular problems. In general, it is desirable to:
 - Orient the building along an east-west axis (place its long sides facing north and south).
 - Provide for some natural ventilation.

- Provide covered walkways if there is a rainy season.
- Hot-dry climates are characterized by wide differences in temperature between day and night. The main problem is to minimize the effects of daytime heat and cool nights. Therefore, it is desirable to take these steps:
 - Orient the building so its long side faces south to southeast. This will minimize exposure to the sun on the west.
 - Use a compact, almost square building shape with small openings.
 - Select white or a light color for the outside walls to reflect sunlight.
 - Use thick construction materials for walls and roof to slow down heat gain and heat loss.
 - Use louvre shutters, trees, and overhangs to keep out direct summer sun.
- Hot-humid climates typically have little temperature change between day and night. The main problem is to provide as much natural ventilation as possible to counteract the high humidity. Here are some ways to do this:
 - Use a rectangular building shape with courtyards and openings on windward side.
 - Orient the building with its long side toward the prevailing wind to maximize natural ventilation.
 - Provide protection from rains and strong seasonal winds.
 - Use light-weight materials for walls and roof.
 - Select a light color or white for the outside walls to reflect sunlight.
 - Use vertical fins and perforated screens or blocks that protect from the sun but allow breezes to pass through.
 - Prevent moisture from the ground from penetrating the floor.
 - Increase the space between buildings, if there is more than one.
- Warm-humid climates are similar to hot-humid climates. Their effect on building design is about the same. Open, low-rise buildings are the most suitable. If a river or body of water is nearby, the breezes can be an advantage for natural ventilation.

SITE AND TOPOGRAPHY

Selecting and planning the site are discussed in CHAPTER 6. Several aspects of the site will influence the design of the building. These include:

- The size, shape, and orientation of the site
- The topographic characteristics (flat or hilly)
- The soil characteristics, particularly in terms of foundations and drainage systems
- The type and location of existing buildings on and near the site

TRADITIONS AND CULTURE

Culture has been described as patterns of learned behavior and values which are shared among members of a group. They are usually transmitted to other members of the group through time. Cultural factors are often as specific to a location as the microclimate. For example, the ratio of solid surfaces to openings in the outside walls of buildings may depend as much on custom as on the climate and materials. A practice that is traditional in one region may not be appropriate in another region within the same country.

Some aspects of culture and tradition that can affect design of a health center include:

- Patterns, values, and behavior related to health and illness. For example, certain types of illness, such as mental illness, may be treated in a certain way.
- The role of traditional practitioners in health care. Certain illnesses may be assigned by custom to traditional health practitioners, for instance.
- The role of family members in health care. Some examples might be mothers staying with children, families cooking for the patient, families doing laundry, relatives coming with the patient on a visit to the doctor.
- Customs associated with labor and delivery.
- The traditional roles of men and women. An example is the separation of men and women in many Moslem countries.
- Local beliefs about privacy. For example, certain topics may be discussed only with female family members and not with health workers.
- The differences in expectations and beliefs between urban and rural people and among various tribal, racial, religious, and income groups.

- Local beliefs about buildings. Some examples are: a trench before a house means bad luck; a room cannot have views on opposite sides; an entrance cannot be placed so that a visitor's shadow will fall across the threshold.

MATERIALS AND CONSTRUCTION METHODS

The building materials and construction methods selected are closely related to the design of the building. Materials may be mostly imported, a combination of imported and local, or mostly local.

Primary-care health centers are not highly complex buildings. Solid, sensible buildings can be constructed using local materials and, in some cases, local construction methods. Here are some of the advantages of using mostly local materials:

- Local workers can be used.
- Materials will be readily available.
- The appearance of the building will be acceptable to the community.
- Replacement and repair will be convenient and less expensive.
- Building costs will be lower.

The materials and construction methods used influence the design of the building. To a large extent, the materials determine the amount of clear span (unsupported roof or ceiling) between walls or columns. This influences how flexible the structure will be and how easy it will be to move a wall to enlarge a room later on.

FLEXIBILITY AND EXPANSION

It is important to think ahead of time about ways to change a building to allow for additional primary-care services in the future. There are two general ways to allow for changes in the design:

- Provide for flexibility in the use of rooms or areas.
- Plan ways to expand the building and add new space.

How much flexibility is desirable depends partly on what services are planned for the first year and in the future. Some flexibility can be achieved relatively simply without increasing construction costs. Here are some examples of simple strategies:

- Use a standard room size for spaces that are used by only a few people (examination room, office, registration area, treatment room,

immunization room, drug dispensing area). ILLUSTRATION 5 shows the same size room used for different functions.

- Design some walls that do not carry the weight of the roof. These can be removed or relocated through simple remodeling in the future.
- Group plumbing fixtures like sinks and toilets together and provide easy connections to the water supply.
- Provide convenient access to electrical lines.
- Use movable furniture rather than built-in benches, counters, tables, and shelves.
- Think in terms of rooms or areas that can have more than one purpose.

Expansion may or may not occur. But because it may be necessary, the planning and design team must think about how and where additions to the health center will go. These decisions must be made early in the planning and design stages.

BUILDING CODES, STANDARDS, AND GUIDELINES

When they are enforced, rules and regulations can have a significant impact on the design of a health center. The purpose of a building code is to protect the health and safety of the people who use a building. With or without a building code, questions about health and safety are important. For example, if there is a fire in the building, what are the escape routes? How well does the structure resist strong winds? Can people easily enter or leave the building in an emergency? If the health center will be located in an earthquake zone, what special precautions should be taken in designing the building?

Standards and guidelines most often deal with functions or activities, rather than with the structure of the building. In a health center, they may involve issues of public health. Here are some of the questions that may be addressed in standards and guidelines:

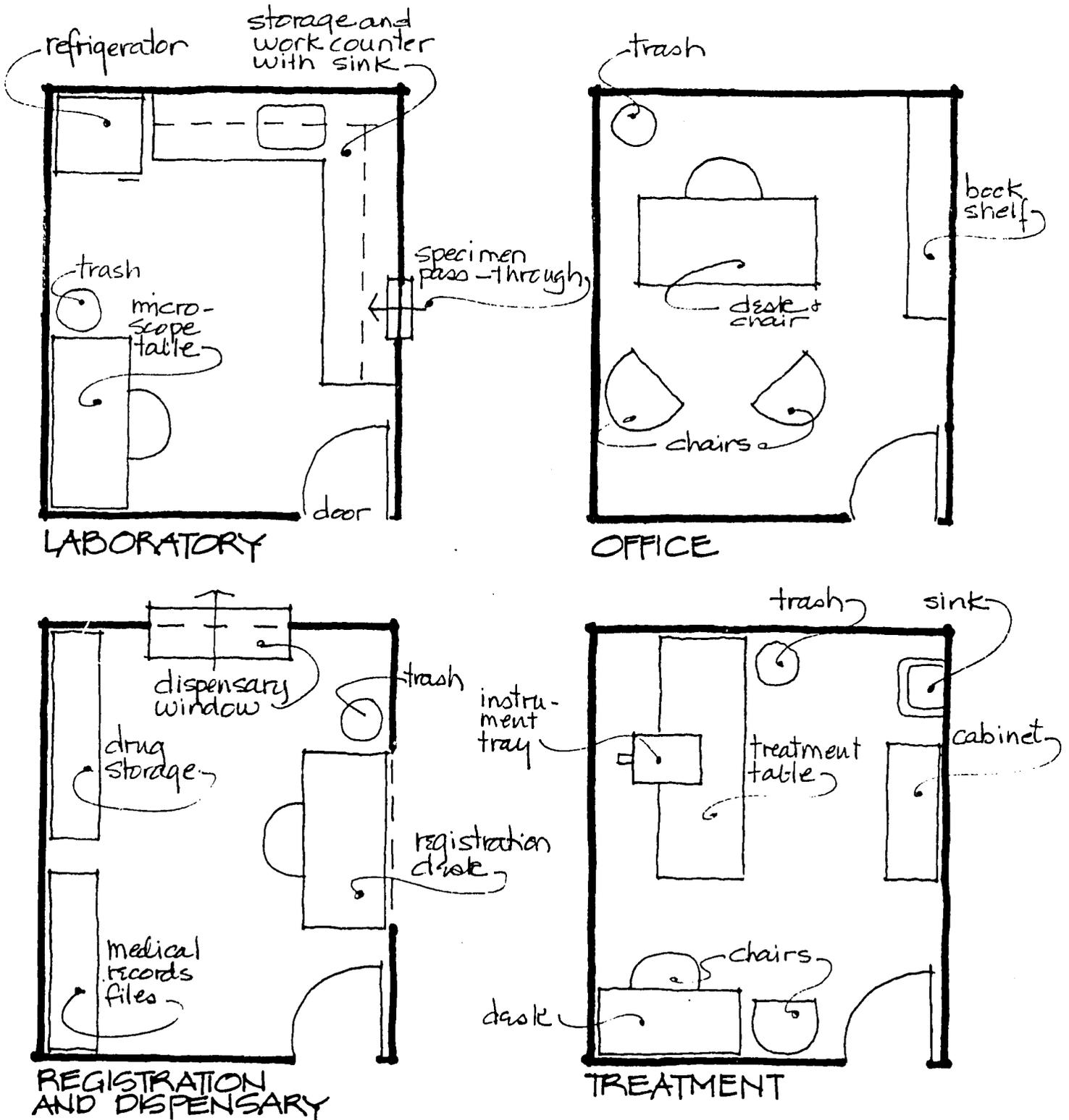
- Should a sink be required in each examination room?
- How many toilets or latrines should be provided for how many people?
- How many examination rooms are required?
- What kind of storage is needed for drugs that require a cool but not a cold temperature?

Codes, standards, and guidelines govern the design of all types of health-care facilities in the more developed countries. But these regulations are often inappropriate for planning and designing primary-care health centers in developing

ILLUSTRATION 5

EXAMPLE OF FLEXIBILITY: SAME SIZE PLACE
BUT DIFFERENT FUNCTIONS

Each of the four rooms is the same size:
10 feet by 12 feet (roughly 3 meters by 3.7 meters or 11.1 m²) or 120 ft²



countries. They simply do not allow for the wide range of conditions found around the world. Most often they are based on Western culture, high technology, different patterns of medical practice, abundant resources, and different utilization rates. Thus the available guidelines and standards are just not useful when manpower and money are limited.

BUDGETARY CONSTRAINTS

The amount of money available for operating and maintaining the health center (the operating budget) is a strong factor in decisions about the design. And the amount of money available for construction and equipment (the capital budget) certainly influences what is realistic and appropriate. CHAPTER 9 provides a more detailed discussion of project budgets.

SUMMARY

Numerous factors influence the design of a primary-care health center. Understanding the planned program of services and the overall space needs is fundamental. But it is not enough. Careful thought must also be given to the particular site, the local climate, traditions, and materials, the possibility of further expansion, building codes, and financing. These factors must all be considered if building design is to be appropriate and sensible. Other goals and priorities of each particular project should also be considered.

8. SHOULD THE HEALTH CENTER INCLUDE BEDS?

MAIN POINTS

ARE BEDS NEEDED?

THE TYPES OF BEDS

 Infirmery Beds

 Labor and Delivery Beds

 Basic Medical Beds

CONCLUSIONS

SUMMARY

8. SHOULD THE HEALTH CENTER INCLUDE BEDS?

MAIN POINTS

This Chapter focuses on how to decide whether or not to include beds in the primary-care health center. The issues that come up in considering beds provide a brief illustration of the overall process of establishing a health center. The interrelatedness of staff, services, patient demand, scheduling, referral links, administrative policies and building design are apparent in this one planning issue.

ARE BEDS NEEDED?

The decision to build a health center, particularly in a rural area, often leads to the possibility of including some beds for hospitalized patients. Adding beds to a primary-care health center means adding new functions. It is a decision that requires careful thought. Some of the questions that should be asked are these:

- Are the beds needed? How many?
- What types of patients will be admitted?
- Are there enough staff members with the skills to care for patients requiring beds?
- What additional services will be needed if beds are included? Possibilities are clinical support, such as a laboratory, or non-clinical support, such as kitchen and laundry services.
- What are the space implications of a decision to include beds? If more space will be needed, how much?

If the center already exists, the question may be whether to add beds. The daily registration book or log should be analyzed by the staff members of the health center, together with program planners. Records of how many patients might have used the beds should be analyzed for several different months of the year, representing the different seasons.

It is important for the staff members to participate in this analysis, since they will often remember more information about the patients than is provided in the log. Patients should be classified into two groups:

PRINCIPAL PLAN BOOK

- Those who did not need hospitalization.
- Those who needed hospitalization. This group should include all patients for whom hospitalization would have been helpful, whether or not they were actually hospitalized.

The patients who needed hospitalization should be further divided into three subgroups, depending on what happened:

- Hospitalization was advised and the patient went to the hospital.
- Hospitalization was advised and the patient did not go to the hospital.
- Hospitalization was desirable but was not advised because it was not possible. Perhaps the patient would not or could not go to the hospital, or transportation was not available, or the hospital was full.

The next step is to determine how many patients from each group could have been cared for adequately each month in the health center if it had included beds. If that number of patients is the same as or more than the number of beds being considered, then beds may be justified by the existing demand.

If the center is being built from the ground up and no records are available, then the exercise just described should be used, but in this case similar health centers serving similar populations should be considered in the same way.

THE TYPES OF BEDS

Beds can be divided into three basic types, depending on what kind of care the patient needs and what staff members provide this care. The three types are infirmary beds, labor and delivery beds, and basic medical beds.

Infirmary Beds

Infirmary beds are used for patients who are ill, infirm, or unstable and who need 24 to 48 hours of care, drugs, fluids, and nutritious food before they can tolerate returning home or moving to the next level of care. Infirmary beds complement the basic walk-in and outreach services provided by the health center. They are primarily for patients who can be treated by a nurse or auxiliary. Two to four infirmary beds might be appropriate for a primary-care health center staffed by an auxiliary or nurse who can diagnose and treat common illnesses without direct supervision by a doctor. Visits by the doctor to the health center would only be occasional, and the doctor would not care directly for patients requiring this type of bed care.

Infirmary beds require little or no extra staff. Most often they add very little to operating costs. Food can be provided by the patient's family. The bed can be a cot, mattress, or mat without linens. If the number of beds is small and--therefore--if few patients are admitted, all care can be easily given

by the nurse or auxiliary. Such care may include dispensing drugs, encouraging fluid consumption, and changing dressings.

So long as there are only two to four beds, the demands on the auxiliary or nurse are modest and will not divert them from their basic tasks of providing walk-in services at the health center and outreach services in the home and community.

In much the same way, cleaning services can be added to the job of whoever is responsible for cleaning the rest of the health center. The auxiliary or nurse should live nearby so he or she can check in at intervals around the clock. Twenty-four-hour staffing is neither desirable nor necessary.

The key factors in determining whether beds of this sort are justified are whether the nurse or auxiliary can safely manage this type of bed patient and the ease or difficulty of travel to a larger health center or hospital. If a center in a remote area employs a well-trained auxiliary or nurse, it may be logical to add a few beds. In an urban area or where it is relatively easy to travel to a hospital, adding beds is often a bad idea and unnecessary. Whenever the nurse or auxiliary does not have the skills to care for infirmity patients, more harm than good will be done by adding beds.

Labor and Delivery Beds

If the nurse or auxiliary is also trained in midwifery or, more likely, if a trained midwife works at the health center, beds may be used for pregnant women who have previously been identified as being at high risk for difficult deliveries. As much as possible, mothers and newborns should be separate from other patients, particularly those with infectious diseases. Thus, rather than using infirmity beds for labor and delivery, it would be wiser to consider a separate area with one or two beds primarily for obstetrical use (labor and delivery). Delivery could take place in bed, and a separate delivery room would not be necessary.

A larger labor and delivery unit with five to ten beds is sometimes appropriate even without infirmity beds or basic medical beds. But if there are labor and delivery beds, the midwife may be more likely to stay in the health center. This would seriously interfere with home visits, outreach services, and home deliveries. The number of beds must be small enough so that basic outreach services are complemented or helped rather than interfered with.

In deciding whether labor and delivery beds are justified, the following issues must be considered:

- One or more full-time trained midwives must be available.
- There must be enough women of child-bearing age within a convenient distance to ensure that the midwife will be kept busy. Three to five deliveries per week is probably a satisfactory minimum.

- The estimated number of deliveries must be enough to justify the beds, and the staff support (such as occasional visits by a doctor) must be adequate. These factors should be considered early in the planning stage. If either staff support or number of deliveries is expected to be too low, then there is good reason not to set up labor and delivery beds.
- Close to 24-hour coverage by a ward helper or assistant nurse is often required. If this person sleeps in the building, as few as one or two staff members in addition to the midwife may be sufficient.
- Bedding must be provided, and facilities for hand laundry must be available.
- Food may be provided by the family or by the health center.
- Simple laboratory services should be available, including the capacity to do either hemoglobins or hematocrits and to test for protein in the urine.
- A modest delivery room with good natural lighting, preferably with electric power, and a portable delivery-room light should be included in the plans.
- Provisions for the staff members to wash their hands near the labor and delivery area are very important.
- If many of the women who choose to deliver in the labor and delivery unit are suspected of being at high risk for difficult deliveries or for having low-birth-weight infants, it may be wise to consider using a small room close to the nurse's or attendant's station as a simple nursery. The door to this room ideally should have a glass pane so newborns can be easily observed.
- The nursery room should be able to be heated and humidified. Pans of water in front of an electric space heater or on a small hotplate are simple and sufficient to provide a substantial gain in warmth and humidity for many newborns. A simple mercury thermometer to monitor room temperature is important.

Basic Medical Beds

Basic medical beds are for patients who require hospitalization and the frequent (daily or near daily) attention of a doctor. Decisions about whether beds of this type are justified should be made carefully. If a health center has a full-time or nearly full-time doctor (one who lives near the center and works either only at the center or at the center and several smaller facilities) and if there are no hospitals nearby, 10 to 20 beds may be appropriate.

These beds should be supported by a simple laboratory able to do microscopic stool examinations, urinalyses, white-blood counts or hemoglobin or

hematocrit, Gram and hemoparasite stains. X-ray or fluoroscopy is not needed at this level of care but may sometimes be included.

In general, basic medical beds at a health center staffed by a doctor should be considered only if the nearest hospital is far away or very difficult for most patients and families to reach. The fact that the beds would probably be used (estimated demand) is not, by itself, a good enough reason to build 10 to 20 basic medical beds.

The following issues should be carefully considered before basic medical beds are added to a primary-care health center:

- Beds for patients being cared for by a doctor require more staff members and are more expensive than either infirmary beds or labor and delivery beds. The treatments needed will be more sophisticated, and the patients will often be sicker.
- If there are basic medical beds, they will almost certainly have to be divided into male and female wards. More women patients or women tending ill children are likely to use beds than men. So there should be roughly twice as many beds for women and children with their mothers as for male patients.
- If staff members work two 12-hour shifts in a day, a nurse or auxiliary working half-time and an attendant working full-time will be needed during the day shift. A full-time attendant will be needed during the night shift.
- If there are three 8-hour shifts in a day, the minimum number of staff members needed will be an auxiliary or nurse half-time during the day shift and a trained attendant who can safely give drugs during the evening and night shifts.
- Unless there is a simple laboratory, the advantages of having beds do not outweigh their costs. Thus a laboratory must be equipped and a worker must be trained to run the laboratory, which can provide services to both walk-in and hospitalized patients. The necessary public services are microscopic stool exam, urinalysis, white-blood count, hemoglobin or hematocrit, and, if it is relevant to the local area, staining and microscopic exam for hemoparasites--particularly malaria.
- Adding beds to the center means an additional cleaner is necessary. Also needed are laundry facilities and a part-time person to do laundry.
- Cooking for patients may be done by families or by the health center. If the families provide food, space for cooking, fireplaces, and shelters for the families may be needed. If the health center provides food, a small kitchen, a cook, and probably a cook's helper are required. Storage for foods and dishes is also needed.

- When basic medical beds are included, a health center becomes more complex. An administrative worker may be needed to assist the doctor. Or one of the senior nurses or auxiliaries may have to spend a substantial amount of time performing administrative tasks, supervising staff, ordering supplies and equipment, scheduling of staff work loads, and managing finances.
- A motor vehicle (car, truck, or Land-Rover) may be required to transfer patients to the next level of care. Often the doctor has a vehicle which serves as an ambulance. But even if this is the case, a driver must be hired and a garage or simple shelter should be provided.
- Extra staff members to care for patients in basic medical beds may need additional housing.
- A health center with basic medical beds will usually require a treatment room for medical examinations and treatments like minor surgery and casting. This room should be close to the in-patient area and also to the examination and treatment rooms for walk-in patients. Surgery should be limited to what can be performed under local anesthesia.
- Substantially increased storage should be planned for linens, drugs, and equipment. Generally different types of supplies are kept separate and under lock and key.
- Bathing facilities and toilets must be provided for bed patients, and hand-washing facilities for the staff are necessary near the treatment room and bed areas.
- Electricity and running water, though not essential, are desirable for a health center with basic medical beds. If electricity and running water are not available and not likely to become available, it usually does not make sense to set up beds, even if a doctor is available.
- Given all of these factors, basic medical beds may add a great deal to capital and operating costs. Consider whether the extra construction costs (capital costs) can be afforded, and whether the staff and supplies for bed patients (operating costs) can be afforded year after year.

CONCLUSIONS

It is, of course, possible to have a health center staffed by a doctor and not to have any beds. In fact, it is quite common. If a midwife is available, it is also quite reasonable to consider labor and delivery beds without basic medical beds, whether or not there is a doctor. Or basic medical beds and labor and delivery beds may be set up at the same health center.

A reasonable range for beds is from zero to 30. If the number of beds of all types is more than 30, the health center becomes so much bigger and more

complex that what is being built is a small hospital, not a primary-care health center. A hospital is a major undertaking. Planning, designing, and operating a hospital is a different and more complicated process than the one described in this guide.

Hospital services focus on "in-patient care," or the care of hospitalized patients, with walk-in services complementing this basic function. Just the opposite is true of a primary-care health center. Such a center emphasizes walk-in care (or "out-patient care") and community services, and it sometimes includes a few beds to complement these activities.

SUMMARY

Beds can increase the usefulness of a health center to the population only if the following statements are true:

- Staff members are not being diverted from primary-care and outreach services in the community.
- There is a high likelihood that the beds are needed and will be used.
- Appropriate staff and supplies are available. Definite plans have been made to train and pay the staff. Supplies can easily be purchased and delivered.
- The additional capital and operating costs can be afforded.

9. THE PROJECT BUDGET

MAIN POINTS

CAPITAL COSTS

Factors Affecting Capital Costs

Estimating Construction Costs

OPERATING COSTS

THE RELATIONSHIP BETWEEN CAPITAL AND OPERATING COSTS

SOURCES OF REVENUE

Revenues for Capital Costs

Revenues for Operating Costs

PREPARING PROJECT BUDGETS

SUMMARY

PROHIBITED FROM REPRODUCTION

9. THE PROJECT BUDGET

MAIN POINTS

Throughout the process of establishing a primary-care health center, the planning and design team must estimate as precisely as possible the probable costs of the project. They should also be familiar with the sources of revenue. Costs fall into two basic categories: capital costs and operating costs. The two types of costs, together with revenues, make up the project budget.

- Capital costs are usually fixed and are very high at the beginning of a project. They are expenses for such things as land, buildings, construction, vehicles, and equipment.
- Operating costs are variable and periodic, and they continue over the life of the program. They include expenses for the staff salaries, supplies, drugs, repairs, electricity, water, and maintenance.

From the beginning, the team must identify and progressively refine their estimates of capital and operating costs. In addition, they must understand the relationship between the two types of costs. Decisions made about the design (such as the building size and construction materials) determine capital costs. They can also affect the operating costs of maintaining and replacing parts of the building.

CAPITAL COSTS

Preparing, monitoring, controlling, and updating the capital budget (the detailed presentation of capital costs) is crucial to managing costs effectively. Typically, the cost of constructing the building is the biggest item in the capital budget. Other costs, such as land acquisition, architect's or engineer's fee, and equipment, are also important.

Factors Affecting Capital Costs

Some of the factors to be considered in estimating capital costs are:

- The general rate of inflation for the national economy
- The inflation rate for the construction industry in particular
- The costs of transporting materials to the construction site

- The type of materials to be used (local, mostly local, or imported)
- The complexity of the construction methods
- Local taxes and customs duties
- The labor costs (note any variations due to availability, skill level, seasonal fluctuation, and degree of specialization required)
- Adverse climate conditions that may affect the transportation of materials and workers, storage of materials, and work on the site
- The type of design and architectural details
- The estimated length of time necessary for construction, plus the length of time needed for planning, design, preparation of materials required by bidders, evaluation of bids (if a competitive contracting process is used), negotiating a contract, and reviews by outside officials or others
- Applicable building codes, standards, and guidelines
- The possibility of changes in the design after construction begins
- The customs and traditions of the area
- The nature and conditions of site

CHECKLIST II lists the major components of capital costs.

Estimating Construction Costs

Construction costs (whether for renovation or for a new building) are usually the major item in the capital budget. How precisely these costs can be estimated is directly related to the amount of information available about the planned building. Cost estimates made early in the planning stage will be cruder than those that accompany the layout or preliminary drawings. Once the final drawings and specifications are completed, the costs estimates should be detailed and more accurate.

For purposes of estimating costs during the planning stage, a unit cost for building one gross square meter (m^2) of floor area is calculated. A typical amount might be \$100 per m^2 . Factors affecting the unit cost are the quality of construction in the area, the current price of materials, the particular construction industry, and anticipated inflation up to the time the construction is expected to begin. The unit cost is usually estimated on the basis of similar buildings constructed recently.

At this early stage, the separate costs included in the estimated unit cost might be:

- Land acquisition
- Site survey
- Site preparation
- Building construction (labor and materials)
- Landscaping
- Architectural and engineering fees
- Equipment and furnishings

A "contingency" is also included in the calculation, to account for unknowns and to compensate for the lack of detail at this early stage. This is a figure by which the estimated cost is increased--perhaps 10% to 15% for new construction and 20% to 25% for renovation. Adjustments are made to the "contingency" figure as more details are known.

During the design stage, many more details of the design are definite than in the planning stage. This greater accuracy can be reflected in the cost estimate. To estimate costs at this stage, it may be useful to multiply the unit cost not only by the expected size of the building but also by a figure that depends on the type of cost. This method will work for new construction as well as for renovation.

For example, it costs more to build a square meter of laboratory space than an equal amount of public or storage space. If $\$100/\text{m}^2$ is the basic unit cost, then the unit cost of public or storage space might be 0.7 times $\$100/\text{m}^2$, or $\$70/\text{m}^2$. A laboratory's unit cost might be 1.3 times $\$100/\text{m}^2$, or $\$130/\text{m}^2$.

Some of the factors that affect the accuracy of this calculation are the reliability of the unit cost, the quality and size of the project, the local, national, or international markets, the factors used for each kind of space, the time at which the actual work will be done, and the extra administrative work that may be required by funding agencies.

Detailed cost estimates are usually made later, when working drawings and specifications are prepared (the final steps in the design stage). Normally, this estimate is the most accurate, because the design is fully developed.

Components of final costs include: site acquisition, site development, demolition, utilities, surface improvements, wells, landscaping, equipment, and building construction. Construction work is often broken down into separate segments according to building trades, such as electrical, mechanical, and plumbing, or by a list of discrete items like covered walkways, new roof, exterior plastering, and fixed equipment.

If the building is being renovated, separate estimates can be prepared for areas needing minor, moderate, and major changes (see CHAPTER 5). Expansion

can be treated as new construction. Detailed estimates for equipment, furnishings, and supplies can be made at this time. "Contingencies" for both construction and equipment must be provided.

Construction costs are typically underestimated at all stages of planning and design, and even during construction. This results in one or more of the following very undesirable results:

- An unfinished building
- A poorly constructed building
- A hastily modified building with space deleted

Thus great care should be taken to estimate costs accurately. Generous margins should always be allowed for the nearly routine errors of underestimation.

OPERATING COSTS

Throughout the process of establishing a primary-care health center, careful attention must be paid to future operating costs. Too often, planners concentrate on the initial capital costs and give little thought to how much it will cost to sustain the center.

Attention must be given to items such as salaries, supplies, drugs, and maintenance. Some of the questions that should be asked at this stage are listed below:

- How many people will work at the center?
- How many staff members are needed? How many are available?
- What is the usual salary for each type of staff member?
- Will it be necessary to train any staff members? How many? How much will training cost?
- Is money for the purchase of furnishings and equipment in the capital or operating budget? (Sometimes it is omitted, with disastrous consequences.)
- What types of supplies will be needed?
- Does any of the equipment require special supplies, such as bulbs for lamps or batteries for generators?
- How often must these supplies be replaced? How much do they cost?
- Will drugs be dispensed at the health center? What kinds of drugs? In what amounts? How often? How much do they cost?

- Will a full-time worker be needed to maintain the building (clean, make minor repairs)? Is such a person available? How much will this person be paid?
- Is there money for spare parts and periodic replacement of equipment and furnishings that wear out?
- If the center includes beds, will workers be needed to do laundry or cooking? How much will these people be paid?

These are only a few of the many questions that need to be asked about future operating costs.

THE RELATIONSHIP BETWEEN CAPITAL AND OPERATING COSTS

For ease in planning, capital and operating costs are often treated separately. But they must also be considered together, since they are closely related. Decisions made about the design and construction of a health center often have a direct effect on future operating costs. In the same way, the availability or scarcity of future funding should directly influence the design and construction methods chosen for the health center.

For example, it may be desirable to buy more expensive and durable construction materials or equipment (higher capital costs) in order to minimize repair and maintenance once the health center is in operation (lower operating costs). Or, if labor is not expensive, it may be more appropriate to use less durable and perhaps less expensive materials (lower capital costs) and make arrangements for maintenance and repairs in the future (higher operating costs). This does not imply, however, that higher capital costs will always mean lower operating costs.

The challenge to the planning and design team is to keep both capital and operating costs as low as possible. To accomplish this, the team needs to explore the cost implications of different design possibilities.

SOURCES OF REVENUE

Revenues for Capital Costs

Identifying sources of revenue is important in estimating the overall costs of a primary-care health center. Funding from central government, local government, and non-governmental sources must be specified. If local materials are to be donated, their value must be accounted for in the budget. Current or future donations from foreign governments, international agencies, or missions also need to be noted.

When planning and designing the center, it is advisable to be familiar with all restrictions that may be imposed under the various financial arrangements.

For example, an agreement with a donor may prohibit using the money for new construction. Or time limits may be imposed as a condition of certain funding. For example, half the money may have to be spent by a certain date, or professional consultants may be required to review certain documents before the money is made available.

The sources of revenue can affect the process of establishing a primary-care health center in a variety of ways:

- Effects on Schedule. To insure their investment, foreign donors or public funding agencies may want to approve activities during the planning and design stages. This requirement often slows a project down more than expected. Such delays can be very costly.
- Effects on the Team. If the source of revenue is a foreign donor, foreign technical consultants often become part of the planning and design team. If there is a good deal of turnover in technical experts, lack of continuity may be a problem.
- Effects on Construction Costs. The additional paperwork and administrative responsibilities imposed by foreign donors or public funding agencies often results in higher cost estimates from contractors.
- Effects on Construction Contract Terms. The contractor often needs some money before construction begins. Often this requires special permission, particularly if funds from a foreign donor are being used.

Revenues for Operating Costs

Operating costs are most commonly met by the national government. It is therefore very important for estimates of operating costs to be reviewed to make sure they fall realistically within the government's capacity to meet such costs. Such a review, to be meaningful, must usually be done by someone who has responsibility for planning and controlling government health expenditures. Often such people are outside the Ministry of Health and in such ministries as Finance and Planning.

Operating costs may be met partially or entirely in other ways. Some of the sources of revenues for operating costs are:

- Fees collected from patients
- Local government subdivisions
- Payments by industry
- Private foreign donors, such as missions and foundations
- Public foreign donors, through bilateral and multilateral funding arrangements

It is important to remember that foreign donors, particularly foreign government agencies, usually do not support operating costs. If they do, it is usually only for a limited period of time.

The key point to remember is that no construction should begin until estimated capital and operating revenues equal or exceed estimated capital and operating costs.

PREPARING PROJECT BUDGETS

One useful way to get an overall picture of the financial situation of the planned health center is to prepare project budgets showing specific sources of revenue, capital costs, and operating costs. CHECKLISTS 12 and 13 show sample capital and operating budgets. Together, these make up the Project Budget. These are not accounting budgets but rather tools with which to view at a glance future financial resources and obligations of the planned health center.

SUMMARY

For cost estimates to be accurate and useful, careful attention must be given to the details of capital costs, operating costs, and sources of revenue, and to the influences each has on the others. It is vital that all costs associated with construction, equipping, supplying, staffing, and maintaining the health center be estimated realistically and that they be affordable.

10. THE CONTEXT FOR PRIMARY CARE

MAIN POINTS

THE LARGER HEALTH CARE CONTEXT

MAJOR ISSUES

Referral

Supervision

Balancing Preventive and Curative Services

Integrating Services

The Public and Private Sectors

SUMMARY

PREVIOUS PAGE BLANK

10. THE CONTEXT FOR PRIMARY CARE

MAIN POINTS

This final Chapter raises some general issues and considers the larger context of health care within which primary-care services should be planned and delivered. All participants in planning and designing health-care centers should be encouraged to identify and question the traditional assumptions on which primary-care programs are based.

THE LARGER HEALTH CARE CONTEXT

No country in the world has a health-care system that is free of history and tradition. Generally, the context of existing services is rather complex, with a mixture of traditional and modern, public and private, health workers and facilities. The combination of services stems from the demands of the population, historical accident, unique cultural factors, locally available resources, unusual disease patterns, and pressure from foreign donors.

Many countries have mounted "categorical" programs with varying degrees of success. These are campaigns directed toward treating or preventing a single disease or health problem, such as yaws, tetanus, malaria, or schistosomiasis. Along with the categorical campaigns it is also common to find small "curative" clinics, devoted to treating or curing a range of common health problems. They are usually run by the government or by missions, which also sponsor the development of central, regional, or district hospitals.

Modern medical services may concentrate on a single disease (categorical) or treat a range of diseases (comprehensive). They may aim to prevent disease by such means as education and immunization (preventive services), or they may treat diseases after they develop (curative services). Wherever they fall on this spectrum, health services are typically planned and provided without any real recognition of pre-existing traditional services and practitioners, their meaning to the population, and the extent to which they are used by the population.

Also common in the health-care system are pharmacies, usually privately operated, that distribute modern drugs in a relatively uncontrolled way. Pharmacists in developing countries can be seen as the traditional healers in modern dress. They dispense drugs that are often powerful and expensive, and that vary widely in effectiveness and risks.

Nearly all governments support hospitals, and most have invested heavily in central, regional, and sometimes district hospitals. Thus in many countries of

PHOTOGRAPH BY

the world today, the health-care system can be called "pluralistic." That means it includes many kind of health workers, both traditional and modern, with a heavy emphasis on hospital services that are supported directly or indirectly by government.

It is a rare and unusual country that does not have more hospitals than it really needs. Often the result is that too little primary care is available.

MAJOR ISSUES

Important issues related to primary-care programs are referral, supervision, balancing preventive and curative services, integrating services, and the relationship of the private and public sectors.

Referral

In many settings, referring the seriously ill patient for treatment at another health facility or hospital may be highly desirable. But referral may not be possible because of difficulties in transportation, long distances, lack of a suitable facility to which to send the patient, or shortage of money. This is a difficult problem which cannot be avoided. It results from the need for planners to make hard choices when money to operate health programs is seriously limited.

It is important for both planners and health workers to realize that the possibility of referral depends on the resources available in a specific country. The lack of a higher-level health-care facility to which patients can be referred is not a valid reason for avoiding the provision of primary-care services. Instead, it indicates the need to train primary-care health workers in palliation (lessening of pain or suffering) and consolation.

Supervision

Supervision of primary-care health workers may be only infrequent as a result of the shortage of money and manpower. A doctor may be able to visit the health center only every few days, or even every few weeks. Certainly some kind of on-site supervision is necessary. But workers can be motivated and trained to manage their own activities in a setting where supervision is only occasional.

Balancing Preventive and Curative Services

Primary care, to be effective, must include both preventive services, largely delivered to one patient at a time or in a small group, and curative services. People all over the world, rich and poor, turn to traditional and modern healers for the relief of pain and suffering. Meeting this need is humane and is demanded by the public. Besides, if pain and suffering are ignored, important preventive services largely directed toward mothers and children will not be accepted.

For example, a mother whose child is feverish and crying from an earache is not likely to be receptive to a message about nutrition or even to an

immunization for the prevention of tetanus. But once the child has received curative services for the earache and feels better, the mother is more likely to accept preventive services and health-education messages.

By developing an effective primary-care program, a country may provide:

- Less expensive, more accessible, and more effective relief of pain and suffering for more people
- Broader access to and use of preventive services

The first makes people feel better; the second contributes to improved health. It is important to remember that preventive services without carefully selected curative services are usually not well accepted. Preventive services are simply not a good investment when offered alone.

Integrating Services

Early in the process of planning primary-care services, there is often a discussion of what other programs can be integrated with primary health care. One extreme is to make primary health care a part of a larger development program. This program might involve veterinary medicine, agricultural extension services, adult education, a marketing cooperative, and primary-care services. All services might be provided out of one site, possibly with a common management structure. They might share the use of a vehicle and also share maintenance.

Equally extreme, and far more common, is primary care with a very narrow focus. For example, services might be strictly limited to curative care. In this case, the planners might have no awareness or concern for the needs of the population and no way of identifying gaps in services, either curative or preventive.

In a town or rural area, it is common to find several categorical programs that are close to each other but do not work together. For instance, a maternal and child-health center may be separate from a family-planning center, which may be separate from an adult-health center, which may be separate from the office of local environmental-health workers, which may be separate from the building housing workers and supplies for a malaria-control campaign. All of these separate categorical programs may have separate buildings and separate administrative and storage systems. In many cases, their support services may overlap or duplicate each other.

When planning a new program or improving an existing one, planners must often decide whether or not to integrate categorical programs into a larger or more coordinated structure, and to what extent. The first step in such a process, if it seems practical and reasonable, may be merely to bring workers together into one building or site.

A more difficult step, but one that often has better results, is to move beyond sharing a building to carefully planned, selective integration of services, eliminating overlap and duplication. This kind of integration requires several steps:

1. Defining a program of services
2. Redefining job descriptions for each group of workers
3. Retraining workers already on the staff

The requirements for a building will differ greatly between a program which merely brings together existing services under one roof and a program which truly restructures those services.

The Public and Private Sectors

Often basic questions are not asked when a program is planned. Such questions include: Are the intended services truly necessary? Do they duplicate existing services? Specifically, do they duplicate services offered by doctors, missions, or pharmacists in the private sector? Is such duplication necessary? Is it a good idea?

The questions that planners in government have to ask themselves stem from the public sector's broad responsibility for preventive and curative services. For many preventive services, particularly those delivered on a community-wide basis--such as management of water and sewage, and the inspection of foods--the public sector is the only source of financing and the only provider.

In the area of curative services, in almost every country of the world there is a mixture of public and private services. The extent to which individual citizens of limited income, moderate income, and high income pay for curative services needs to be thoroughly understood. The public budget is always very limited. But by understanding and capitalizing on private expenditures for curative services, it may be possible to do a better job of supporting preventive services, which can only be provided by the public sector and which are almost always underfunded.

For instance, it may be possible to train existing private health workers (doctors and nurses) to provide better maternal and child-health services and to give them financial incentives to provide improved services. This could encourage the private sector to do a much better and more comprehensive job in the area of maternal and child-health services. Such a strategy might be cheaper and more effective than investing in comprehensive primary-care health centers that receive only public funding and are in direct competition with existing private health workers. The public money saved could then be used to provide facilities and services in the areas that are most seriously underserved, or to pay for preventive programs in the community such as basic environmental health and sanitation.

Investments by the private sector are rarely controlled effectively by government today. But the government must be aware of them and plan to invest its own limited public resources in a way that leads to private-sector expenditures wherever possible. This can have the effect of reducing costs to the public sector.

SUMMARY

In planning for primary-care, it is necessary to understand both what is desirable and what is possible, given the limits on available financial and other resources. Planners must continually examine their intended program of services and their proposed building design in order to arrive at a plan for a primary-care health center that is affordable and that will effectively serve the people in the area.

This guide describes the various steps in the process of planning and designing a primary-care health center. Its most important goal is to encourage the people responsible for planning services, designing the building, and providing the primary-care services to work together throughout the planning and design stages.

The planning and design team must make important decisions about these interrelated elements in the program of primary-care services:

- The nature of the services to be provided
- The site where the services will be provided
- The roles of different health workers
- The design of the building to house the services
- The costs of constructing the building
- The ongoing costs of operating the health center

Interaction among all the individuals involved in planning and design helps avoid misunderstandings and problems. The result should be better building designs and better primary-care service programs, which serve the population in the area effectively and at a cost that can be afforded.

APPENDICES AND BIBLIOGRAPHY

PREVIOUS PAGE BLANK

Appendix A. INFORMATION: TYPES AND SOURCES

MAIN POINTS

HOW MUCH INFORMATION IS ENOUGH?

INFORMATION ABOUT THE POPULATION TO BE SERVED

INFORMATION ABOUT AVAILABLE RESOURCES

Manpower Resources

Facility Resources

Financial Resources

SUMMARY

PREVIOUS PAGE

Appendix A. INFORMATION: TYPES AND SOURCES

MAIN POINTS

This Appendix discusses the kinds of information that are needed to plan a primary-care health program and the building to house it. In reality, perfectly accurate and complete data can never be obtained. But more information is usually available than is thought to be the case. Gathering the necessary information from existing sources requires careful observation and asking the right questions of the right people. Lists of information that is useful in planning a primary-care health center are provided.

HOW MUCH INFORMATION IS ENOUGH?

A traditional, academic approach to health planning stresses that obtaining certain kinds of information is a basic first step in planning the program and building. But it is often difficult, if not impossible, for actual planners to meet the standards established in theory.

Planning for primary care does not necessarily require sophisticated information, but it does require some basic data. And it is rarely the case that none of the necessary information is available. Even when resources are limited, there is usually a wealth of information to be had when sources are examined closely.

What is required is asking the right questions, making an attempt to answer each one based on what is already known, and then determining what minimum additional information is necessary. All members of the planning and design team must share whatever information they have with all other members of the team, and all must work together to obtain the necessary new information.

The difficulty of obtaining exact information should not prevent the team from putting together information that realistically reflects the situation. Assembling good information need not involve sophisticated survey techniques. This information can almost always be put together from basic data available from the central and regional government, supplemented by information from local sources.

One useful method is to have the members of the team visit the area and talk with regional administrators, local residents, merchants, community leaders, and health workers. This kind of information-gathering tour means making and recording careful observations.

The rest of this Appendix suggests the kinds of questions that should be asked and the kind of information that is probably available. In many cases, information that is readily available will be sufficient for thoughtful decisions to be made about the primary-care health program and the building that will house it.

PREVIOUS PAGE

INFORMATION ABOUT THE POPULATION TO BE SERVED

Certain information about the culture, economy, and health of the population is very important. It not only reveals a great deal about the health services that are probably needed but also provides some clues about the kind of programs and buildings that will be acceptable to the population and that will therefore be used. CHECKLIST 14 (see Appendix B) shows the kind of social, economic, and health information that should be sought and indicates why it will be useful.

It is best to obtain information about all the factors both for the present situation and for some future date. Then planners can make some allowances for the changes that will almost certainly occur. For example, if trends indicate that the population of certain areas around the capital city is likely to double in the next ten years, this probable change should be taken into account in planning the health center. If migration to these fringe areas seems to be coming primarily from one region, then the likely decrease in the population of that region and the probable changes in its service needs should be noted.

INFORMATION ABOUT AVAILABLE RESOURCES

The major resources to be considered are manpower, facilities, and financing.

Manpower Resources

Before designing a primary-care health program, it is essential to identify the health workers who will provide the services. Some questions that need to be asked when assessing health manpower resources are listed in CHECKLIST 15.

Manpower lies at the heart of a primary-care health program. Thus it is advisable to assess manpower resources--that is, the availability of trained workers to staff the center--in person. It is important for team members to visit the area that will be served by the primary-care health program and determine the actual skills of the present and potential staff members. It is also important to talk with the local health workers, whether they are traditional healers or modern health workers, in order to assess their skills and receptivity to training.

As in the case of information about the population, culture, and economy, formal survey techniques are not necessary. A great deal of insight can be gained by observation and by asking questions like these:

- What is already being done by specific types of workers?
- How well is it done?
- What are workers allowed to do?
 - What is customary for them to do?
 - What needs to be changed to allow for new responsibilities?

- What were their previous jobs?
- Who, if anyone, supervises these workers?
- Is there any training for supervisors?

Asking these questions and analyzing the available manpower in an area, region, or country is a critical early step in planning any program. It is important to be realistic and honest in this assessment. Too often primary-care health programs are designed, buildings are constructed, and community expectations are heightened; then it is discovered that there is no one to staff the health center and provide the services. Or it is discovered that although the program was to include emergency first aid, no one on the staff has been trained to do it.

Facility Resources

Available buildings also need to be identified before a new primary-care health center is designed. As discussed in detail in CHAPTER 6, information must be gathered on existing buildings: their type, location, and the amount of flexibility they allow. If this information is assembled in the early stages of establishing a primary-care health center, unnecessary duplication of facilities can be avoided.

Financial Resources

The major issues related to funding and financial resources are discussed in CHAPTER 9. The importance of these issues cannot be overemphasized, since they affect all aspects of the program by limiting or defining what it is possible to do.

It is especially important to know the limits of the money available for building and running the health center. Planners can then decide the best way to use the available resources. Any time limits set by funding agencies should also be taken into account.

SUMMARY

The issues and questions mentioned in this Chapter and in CHECKLISTS 14 and 15 are not meant to be complete. Instead, they suggest some basic information that needs to be gathered--either at the beginning of the planning process or somewhere along the way. The most important points to keep in mind are these:

- Do not underestimate what you already know.
- Information must be gathered jointly and shared with all those responsible for planning the health center.

116 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

- Complete and perfectly accurate information will never be available.
- Decide how much time and money can be spent to gather information and do the best you can within those limitations.

Appendix B. CHECKLISTS

INTRODUCTION

- Checklist 1. STAFFING PATTERN
- Checklist 2. SERVICES TO BE PROVIDED
- Checklist 3. PATIENT FLOW THROUGH THE HEALTH CENTER
- Checklist 4. EXPECTED UTILIZATION OF
PRIMARY-CARE SERVICES
- Checklist 5. SCHEDULE FOR PATIENT VISITS
- Checklist 6. ADMINISTRATIVE POLICIES AND PROCEDURES
- Checklist 7. ARRANGEMENTS FOR RECEIVING AND STORING
SUPPLIES AND DRUGS
- Checklist 8. REFERRAL LINKS TO THE NEXT LEVELS OF CARE
- Checklist 9. EVALUATING AN EXISTING BUILDING
- Checklist 10. ELEMENTS OF CLIMATE
- Checklist 11. COMPONENTS OF CAPITAL COSTS
- Checklist 12. SAMPLE FORMAT FOR A CAPITAL BUDGET
- Checklist 13. SAMPLE FORMAT FOR AN OPERATING BUDGET
- Checklist 14. SOCIAL, ECONOMIC, AND HEALTH INFORMATION
DESIRABLE FOR ESTABLISHING A PRIMARY-CARE
HEALTH CENTER
- Checklist 15. DESIRABLE INFORMATION ABOUT
AVAILABLE MANPOWER

Appendix B. CHECKLISTS

INTRODUCTION

This Appendix presents all the Checklists referred to in CHAPTERS I through 10 and in APPENDIX A. Planners and designers should feel free to use them as guides, and to adapt them as necessary to particular situations. Not all questions may be relevant to the health center you are planning, and others may need to be added.

The Checklists can be duplicated (on a mimeograph or photocopying machine or by hand) so that individual members of the planning and design team can use them for actual estimates and lists.

In most cases, it is a good idea to include two answers to each of the questions in the Checklists. First, give the answer that is appropriate for the time the health center will open and for the first year. This represents the immediate situation. Then give a second answer for the future, probably for the second through fifth year of operation of the health center. This represents the desirable goal.

PREVIOUS PAGE BLANK

CHECKLIST I

STAFFING PATTERN

Include how many of each type of staff member (doctor, nurse, etc.) will be ready to provide services on opening day and how many staff members are anticipated for the future. For each type of staff member, note specific skills (such as giving immunizations and dispensing drugs) and the time (hours per day or days per week) that each will actually be in the health center.

What types of staff members are or will be available? The following list is only an example. A list that is specific for the types of workers in a country or region of a country should be developed. Indicate whether these staff members will work full-time or part-time, and how many hours or days.

<u>Health Worker</u>	<u>Skills</u>	<u>Time</u>
• Doctor		
• Nurse midwife		
• Traditional midwife		
• Nurse (by type)		
• Auxiliary health worker		
• Sanitarian		
• Malaria-control worker		
• Outreach worker		
• Family-planning worker		
• Ward helper or assistant		
• Cleaner or janitor		
• Others		

Are there any health workers who come to the health center periodically and who require space for tests, seeing patients, or storage?

- Sanitarian
- Outreach worker
- Epidemiologist
- Others

PREVIOUS PAGE BLANK

122 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

Does one person perform many functions? For instance, does one nurse or auxiliary register patients and immunize babies and dispense drugs?

What are the plans for training or retraining staff?

Who manages the day-to-day operations of the health center? Who supervises what other workers?

How much time does it take for different types of staff members to perform the same function? For instance, a doctor may examine a patient in three to five minutes, while a nurse or auxiliary requires eight to ten minutes.

CHECKLIST 2

SERVICES TO BE PROVIDED

Include all services to be provided right away (within the first year) and all services planned for some future date. List any additional services under each heading.

CURATIVE SERVICES

Medical Services

- Treat endemic diseases (such as malaria)
- Treat diarrhea
- Treat rash
- Treat upper respiratory infections
- Treat lower respiratory infections
- Manage tuberculosis
- Manage hypertension and diabetes
- Others

Treatment of Injuries

- Suture a cut
- Treat burns
- Treat insect or snake bites
- Stabilize seriously ill patients, then refer
- Others

Drug Dispensing

- Dispense drugs
- Refill drugs
- Others

Laboratory Services

- Hemoglobin
- Hematocrit
- Stool exam (microscopic)
- Urinalysis
 - Protein
 - Sugar
 - Microscopic
- White-blood count
- Stain and examine for hemoparasites
- Others

PREVENTIVE SERVICES

Maternal and Child-Health Services

- Prenatal and postnatal care
- Delivery services
- Family planning
- Nutrition education
- Well-baby services (check-ups for healthy infants)
- "Under-five" services (check-ups for children under five)
- Child health education
- Others

Immunizations

- Polio
- DPT (diphtheria, pertussis, tetanus)
- Measles
- Others

Health Nutrition and Education

- Individual education
- Group education
- Others

Public Health and Outreach

- Inspect public places
- Inspect water sources
- Inspect butchers
- Visit schools
- Visit homes
- Family planning
- Malaria control
- Others

CHECKLIST 3

PATIENT FLOW THROUGH THE HEALTH CENTER

Does everyone register upon arrival? Who registers patients?

Is registration the same for all types of patients?

- New patients
- Return visits
- Emergency first-aid cases
- Others

Is any screening done when patients arrive to group them by what kind of service they need? Are certain groups sent to particular areas?

- Medicine refill to drug line
- Minor trauma to nurse or auxiliary or to doctor
- Immunizations to nurse or auxiliary
- Others

Is everyone seen by the same nurse or doctor?

Does everyone tend to arrive at about the same time?

Do family members accompany patients through all steps of the process? How many?

Do patients come in and go out the same door?

Is the drug dispensing area the last stop in the process?

1988 APR 21 AM 11:11

CHECKLIST 4

EXPECTED UTILIZATION OF PRIMARY-CARE SERVICES

You should estimate both initial utilization of services (during the first year of operation) and future utilization.

For estimates based on the experience of a similar health center:

- What is the total population served by the health center (service area population)?
- What services does it provide?
- Are different services planned for the new health center that will affect the demand for service?
- What is the staffing pattern of the center? How many health workers and what kinds are on the staff?
- Does the daily registration log include patients who came to the health center but never saw a health worker?
- How many patients, on the average, does the center see in a day, a week, a month, or a year?

For estimates based on population figures:

- Estimate the population within a "reasonable" travel time from the health center.
- What is the distribution of the population by age and sex? Use the following table:

	<u>% Male</u>	<u>% Female</u>
Under 5		
5 to 14		
15 to 44		
45 to 64		
65 and over		

- What are the population estimates for the next five years? How will growth or decline affect utilization figures and long-range plans?

PREVIOUS PAGE BLANK

109 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

- Estimate the number of visits per year for each age group. Remember that children under five and women of child-bearing age (15 to 44) tend to be the most frequent users of services. Be sure to consider any planned services which might significantly increase or decrease use by one group (such as plans for an "under-five" clinic.)
- Based on these assumptions, calculate the expected total number of visits to the health center in a year. This is the expected utilization of services.
- Remember to consider other health workers--either traditional or modern. They will probably continue to be used, so utilization estimates for the new center should generally be adjusted downward (lowered) to reflect health care given by others outside the health center.

CHECKLIST 5
SCHEDULE FOR PATIENT VISITS

Include screening plans for the first year of operation and for the future.

What hours and days will the health center be open?

What hours each day will patients be seen?

What days each week will patients be seen?

Will certain days each week (or hours each day) be set aside for particular types of patients or particular primary-care services?

- Curative services (the most common walk-in visit for the treatment of illness or injury)
- Under-five clinic (check-ups for children under five)
- Prenatal visits
- Postnatal visits
- Immunizations
- Family planning
- Nutrition education
- Others

How many patients can be seen in an hour? In a day?

- Examinations by a doctor (new or returning patients)
- Immunizations
- Laboratory tests
- Examinations by a nurse or auxiliary
- Prenatal visits
- Postnatal visits
- Others

CHECKLIST 6

ADMINISTRATIVE POLICIES AND PROCEDURES

Is there a goal or policy regarding outreach?

- Will any staff members provide care outside the center? Will this work affect the time they can spend at the center?
- Will the outreach services bring more patients to the health center?

What is the policy regarding staff supervision?

- Who supervises what other staff members?
- Is a supervisor present all the time?
- Who is responsible for overseeing the operation of the health center?
- Are there written job descriptions?

What types of medical records will be kept?

- Will there be an entry in the patient's record for every visit?
- Does a record-keeping system need to be developed, or is such a system already provided for?
- Will the patient's records be kept by the patient or at the center?
- How will the records be filed? By individual? By family? How will the staff locate records?

Will statistical and epidemiological data (on births, deaths, selected illnesses, and utilization of services) be collected? Who will perform this task?

What, if any, are the national or regional requirements for reporting births, deaths, diseases, patient visits, community or environmental statistics, or other statistics?

Is there a policy about how many people may accompany a patient?

How will patient flow be organized?

- Will all patients register?
- Will patients be screened and grouped by the reason they have come to the health center?

PREVIOUS PAGE BLANK

When will patient visits be scheduled (what days or hours)?

List other policies that may affect the design or program of the health center.

CHECKLIST 7
ARRANGEMENTS FOR RECEIVING AND STORING
SUPPLIES AND DRUGS

Do supplies and drugs come from a central office?

Do supplies and drugs come automatically, or must they be ordered?

Who at the health center is responsible for monitoring supplies and drugs? For ordering, checking, storing, and dispensing them?

Do supplies and drugs arrive on a regular basis?

- Every week
- Every month
- Every year
- Other

How much of each item is typically received?

How are these items stored? Some possibilities are:

- Refrigerator
- Shelves
- Separate room
- Locked container

In the local climate, do drugs need to be stored under special conditions?

If there is a sanitarian who checks wells and other water supplies, does he or she need storage space for sample jugs or containers? How much space?

Where will laboratory samples be stored?

Do staff members or traveling health workers have any special storage needs?

List any other special requirements related to supplies and drugs.

CHECKLIST 8

REFERRAL LINKS TO THE NEXT LEVELS OF CARE

Is referral practical? Can it be afforded? Is public or private transportation available? Is the next level of care close enough and enough more sophisticated to make referral worthwhile?

What is the referral plan for patients who cannot be treated at the primary-care center? Where is the nearest hospital?

What means of transportation does the patient use to get to the hospital?

Does the center have a vehicle for transporting patients?

Where is the vehicle kept when not in use? Who maintains it?

In the event of accident or other serious illness, how is the patient cared for until more specialized care is obtained?

PREVIOUS PAGE BLANK

CHECKLIST 9

EVALUATING AN EXISTING BUILDING

This checklist can be used as a guide for either a preliminary evaluation or for a detailed evaluation. A preliminary evaluation is often useful and may be all that can be done. The checklist can be used to evaluate an entire building, part of a building, or a room.

- Age or date built _____
- Type of construction _____
- Number of storys _____
- Gross area (each story, determined by measuring outside dimensions) _____
- Gross area (total, determined by measuring outside dimensions) _____
- Structure (type and condition) _____
- Roof (type and condition) _____
- Floors (types and conditions) _____
- Ceilings (types and conditions) _____
- Interior walls (types and conditions) _____
- Exterior walls (types and conditions) _____
- Windows (types and conditions) _____
- Floor plan for each story (attach sketch) _____
- Net usable space per story (determined by measuring inside dimensions) _____
- Net usable space per room (determined by measuring inside dimensions) _____
- Stairways (location and condition) _____
- Heating system (type and condition, if applicable) _____

PHOTOGRAPHIC COPY

140 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

Natural ventilation or air conditioning
(if applicable) _____

Plumbing (type and condition) _____

Electrical capacity and outlets _____

Finishes (paint, tile, etc.) _____

Lighting fixtures (number, location, and type) _____

Fixed or built-in furniture or equipment _____

Size, configuration, topography, and
orientation of site _____

CHECKLIST 10
ELEMENTS OF CLIMATE

Decide which range is typical of the area where the health center will be located.

SOLAR RADIATION AND TEMPERATURE

Be sure to obtain monthly averages and 24-hour ranges:

- cold: below 10° C (below 50° F)
- cool: 10° to 15° C (50° to 60° F)
- temperate: 15° to 30° C (60° to 86° F)
- hot: 30° to 38° C (86° to 100° F)
- very hot: above 38° C (above 100° F)

RELATIVE HUMIDITY

- very dry: 0% to 25%
- dry: 25% to 50%
- humid: 50% to 75%
- very humid: 75% to 100%

PREVAILING WINDS

What is the direction of air movement?

- north
- south
- east
- west

PRECIPITATION

What is the impact of rain or snow on temperature and humidity?

What provisions have been made for drainage?

What is the average rainfall per year?

In what months does the most rainfall occur (the rainy season)?

How long does the rainy season last?

CHECKLIST II
COMPONENTS OF CAPITAL COSTS

COMPONENTS OF COST	AMOUNT
Acquisition of land	_____
Topographic survey	_____
Soils analysis and borings	_____
Site preparation	_____
Building construction	_____
• New construction	_____
• Major renovation	_____
• Minor renovation	_____
Equipment and furnishings	_____
Landscaping	_____
Contingencies	_____
• New construction (10%)	_____
• Renovation (10% to 30%)	_____
• Equipment (10% to 15%)	_____
Architectural or engineering fees	_____
Services and utilities	_____
• Electricity	_____
• Sanitary	_____
• Water connection and source	_____
• Emergency power	_____
Cost factors for inflation and escalation	_____
TOTAL	_____

CHECKLIST 12

SAMPLE FORMAT FOR A CAPITAL BUDGET

<u>Expenses</u>	<u>Source of Funds</u>				
	<u>Foreign Donor</u>	<u>Ministry of Health Budget</u>	<u>Other Government Agencies</u>	<u>Local Contribution</u>	<u>Other</u>
Acquisition of land					
Topographic survey					
Soils analysis and borings					
Site preparation					
Building construction					
Equipment and furnishings					
Landscaping					
Contingencies					
Architectural or engineering fees					
Services and utilities					
Cost factors for inflation and escalation					
TOTAL					

PREVIOUS PAGE BLANK

CHECKLIST 13

SAMPLE FORMAT FOR OPERATING BUDGET

<u>Annual Costs:</u>		<u>Annual Revenues</u>	
Personnel			
Full-time	_____		
Part-time	_____		
Total personnel	_____		
Consultants	_____		
Supplies		Central Government	_____
Drugs	_____	(for instance,	
Dressings	_____	Ministry of Health)	
Linen	_____	Local Government	_____
Cleaning materials	_____	Industry	_____
Gas and oil (vehicle)	_____	Patient fees	_____
Other	_____	Foreign donor	_____
Total supplies	_____		
Utilities			
Electricity	_____		
Water	_____		
Fuel (heating)	_____		
Telephone	_____		
Total utilities	_____		
Rent or equivalent (if applicable)	_____		
Maintenance*			
Building	_____		
Equipment	_____		
Vehicles	_____		
Total maintenance	_____		
Other	_____		
TOTAL	_____		_____

*Include such costs as paint, plaster, spare parts, and fees for workmen and mechanics.

RECEIVED
 1983
 1983
 1983

CHECKLIST 14
SOCIAL, ECONOMIC, AND HEALTH INFORMATION
DESIRABLE FOR ESTABLISHING
A PRIMARY HEALTH-CARE CENTER

USEFUL INFORMATION	WHY NEEDED
<u>Population</u>	
Number in country	Provides base figure for calculating utilization of health services
Number in region	Indicates distribution of population through the country
Number in area to be served (if smaller than the region)	Provides base figure for estimating utilization
Estimated future growth rate	Anticipates future needs
Rough age structure (infants, children, adults, elderly people)	Indicates health-service needs. For example, a large portion of infants and young children means a high incidence of diarrhea, middle-ear infection, and other early childhood diseases
Sex ratio	Indicates health-service needs. Many women of child-bearing age means that family planning and obstetrical services are needed
Crude birth rate	Indicates population growth and future needs
Trends in migration (rural to urban, north to south, mountains to village)	Indicates areas of growth and may help in determining where to locate the health center
<u>Culture and Economy</u>	
Household size (number of people living in one dwelling)	Indicates what constitutes a family and who may be a potential caregiver

PRINTED FROM DATA

150 / PRIMARY CARE CENTERS WITH LIMITED RESOURCES

Household distribution
(How dispersed is the population? Is it nomadic? Is it concentrated in villages? Is it concentrated in cities?)

Helps determine the location of services, health workers, and buildings

Travel patterns
(Are any roads or pathways used more frequently than others, such as the road to the church or market?)

Helps determine location of services, health workers, and buildings

Commercial patterns
(location of the markets, if any, market days)

Helps determine the location of services, health workers, and buildings. For instance, if no markets are apparent, this may be a sign of a subsistence economy, which has implications for the organization of services

Income level and distribution

Indicates the organization of the economy. Helps determine the organization of services

Religious groups
(largest single group, others)

Suggests how receptive population is to modern medicine. May help determine staffing and building design

Health

Infant and maternal mortality rates

Indicates general level of health in the population. Indicates health-service needs

Life expectancy

Indicates general level of health in the population. Indicates health-service needs

Ten most common reasons people in area seek treatment
(morbidity rates)

Indicates types of services, supplies, and spaces needed

Current utilization rates of health centers, clinics (if any), doctors, pharmacists, midwives, hospitals, and traditional health practitioners. Remember to include both public and private health workers

Indicates current demand for health services and need for new services. May indicate acceptable types and locations of services

Estimated utilization rates for the future

Indicates future health-service needs. This information is useful even if estimated rates are speculative

CHECKLIST 15

DESIRABLE INFORMATION ABOUT AVAILABLE MANPOWER

Who is currently providing health care? List types (doctors, nurses, auxiliaries, pharmacists, midwives, and others), numbers, and locations.

Of those currently providing health care, approximately what percentage are trained in modern medicine and what percentage are traditional healers?

What are the current skills of these health workers? Without much training, could they assume more tasks? For instance, a village health worker may currently be providing well-child services, giving immunizations, and registering patients. Will this person require further training to do family planning and nutrition and health education? If yes, how much?

Are any new health workers now being trained? Will they be able to begin to provide health services in the next three to five years?

If health workers are being trained, what will their skills be?

What provisions have been made for supervising health workers locally and regionally?

In this culture, is it considered desirable or undesirable to become a health worker? (This question is concerned with the pool of people who will agree to be trained if such training is planned.)

PREVIOUS PAGE BLANK

BIBLIOGRAPHY

- ADEOKUN, Lawrence A., and Omalade Adejuyigbe, Estimates of Proposed Modifications to Existing Primary Health Care Units for the Implementation of the Basic Health Services Scheme in Ife/Ijesa Area. Unpublished report. Ife-Ife, University of Ife, June 1978. 41 pages.
- AGUNA, Hector R., "Medical Care in Latin America." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 17 pages.
- AHMAD, Shabbir, "Primary Health Care Viewpoint of a Country General Practitioner." World Hospitals 11:108-111, Spring 1975.
- ALEXANDERSON, Karl., "Planning and Building of Health Care Facilities for Sick Children." World Hospitals 11:167-168, Spring 1975.
- ALLEN, Rex Whitaker, "Basic Conditions and Regional Planning." World Hospitals 11:234-236, Summer 1975.
- , "Planning and Building With Regard to Time--Methods and Means of Adaptation to Changing Functions, Requirements and Increasing Standards." World Hospitals 11:74-81, Spring 1975.
- BANTA, James E., "The Health Programs for the Agency for International Development." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 17 pages.
- BAURES, H. G., "Development and Organization of Health Service for Outpatients in a District with Rural and Industrial Population." World Hospitals 11:161-163, Spring 1975.
- BENNETT, J. J., "Primary Health Care and Developing Countries." Social Science and Medicine 13A:505-514, 1979.
- BLANDFORD, J. M., "Organization of the Pre-Design Phase Operational Policies--Methodical Programming." World Hospitals 11:93-95, Spring 1975.

This bibliography originally appeared in "Planning and Building Health Care Facilities under Conditions of Limited Resources," a special issue of World Hospitals 11, nos. 2-3, Spring-Summer 1975.

- BOECKLER, Martin, "Planning and Building of Health Care Facilities in Rural Areas in View of Climate, Building Material and Building Techniques." World Hospitals 11:218, Spring 1975.
- BRIDGMAN, R. F., "Regional Planning of Health Care Facilities and Regional Collaboration Between Health Care Institutions." World Hospitals 11:65-67, Spring 1975.
- BRIDGMAN, R. F., et al., "Health Care Facilities in Developing Countries: Prevailing Concerns and Possible Solutions." World Hospitals 16:38-43, February 1980.
- BROOKE, D. E., "Introduction to Rural Medical Care." World Hospitals 11:197, Spring 1975.
- BROWN, Roy E., and Joe D. Wray, "The Starving Roots of Population Growth." Natural History 83:46-53, January 1974.
- , "Medical Problems of the Developing Countries." Science 153:271-275, July 15, 1966.
- BRYANT, John, Health and the Developing World. Ithaca, Cornell University Press, 1969. 345 pages.
- BURFIELD, John, "Future Development of Health Planning Policy." World Hospitals 11:59-62, Spring 1975.
- BURFIELD, J., and A. Law, Construction Standards and Methods Appropriate for Simple Building Needs. A study financed by the UNDP as Inter-Regional Project No. INT/77/021/A/01/42 with the World Bank as Executing Agency. June 1979, Part 1, Sections 4 & 5.
- BURGUN, J. Armand, "The Planning and Building of Health Care Facilities--Some Principles." World Hospitals 11:73, Spring 1975.
- , "Programming, Planning and Design of Health Facilities in Developing Countries: A Case Study." Paper delivered at the World Trade Institute/ Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 15 pages.
- CENTER FOR DEVELOPMENT STUDIES, Central University of Venezuela, Health Planning: Problems of Concept and Method. Scientific Publication No. III. Washington, D.C., Pan-American Health Organization, April 1965, 77 pages.
- CHRISTIE-SHAW, Susan, Final Report: Rural Community Health Project of Integrated Services in Siliana and Sidi Bou Zid Provinces, Tunisia. Unpublished report for USAID/NE, July 15, 1977. 57 pages.

- DEQUEKER, Paul, "A Bioclimatic Approach to Tropical Architecture." World Hospitals 11:212:217, Spring 1975.
- DJUKANOVIC, V., and E. P. Mach (eds.), Alternative Approaches to Meeting Basic Health Needs in Developing Countries. Geneva, World Health Organization, 1975. 116 pages.
- DROTMAN, Jay S., and William A. Porter, "A Conceptual Framework for Health System Planning in Developing Nations." World Hospitals 15:120-124, May 1979.
- DUNCAN, J. W. Kwamina, "Planning of Environmental Health Infrastructure and Sanitary Facilities in Health Institutions in Kenya." World Hospitals 11:204-206, Spring 1975.
- ENGLAND, Roger, "More Myths in International Health Planning." American Journal of Public Health 68:153-159, February 1978.
- ERAJ, Yusaf Ali, "The Organization of Doctors and the Improvement of Health Services in the Developing Counties." World Hospitals 11:112-113, Spring 1975.
1975.
- FATHY, Hassan, Architecture for the Poor. Chicago and London: University of Chicago Press, 1969. 194 pages plus appendices.
- GISH, Oscar, Guidelines for Health Planners. The Planning and Management of Health Services in Developing Countries. London, Tri-Med Ltd., 1977. 90 pages.
- , Planning the Health Sector: The Tanzanian Experience. Second ed. London, Croom Helm Ltd., 1975. 215 pages.
- GOLDFINCH, D. A., "Effect of Operational Experiences on Future Requirements for Designing and Building of Health Care Facilities." World Hospitals 11:207-211, Spring 1975.
- , "Organization of Planning, Building and Operation of Health Care Facilities Under Conditions of Limited Resources." World Hospitals 11:237-239, Summer 1975.
- , "Planning and Building of Health Care Facilities in View of Operational Techniques--The Nurses' Point of View." World Hospitals 11:122-123, Spring 1975.
- GOLLADAY, F. L., and C. K. Koch-Weser, "The New Policies for Rural Health: Institutional, Social and Financial Challenges to Large Scale Implementation." Proceedings of the Royal Society of London (Biology) 199: 169-178, October 19, 1977.

- GONZALES, Jose, "Aspects of Health Planning in Developing Countries." Unpublished paper. 15 pages.
- HABICHT, Jean-Pierre, "Health for All by the Year 2000." American Journal of Public Health 71:459-461, May 1981.
- HAIJARI, Gideon B., "The Role of the Health Center in the National Health Program in Kenya." World Hospitals 11:198-203, Spring 1975.
- HEIBY, James R., "Low Cost Health Delivery Systems: Lessons from Nicaragua." American Journal of Public Health 71:514-519, May 1981.
- HOOD, Thomas R., "Low-Cost Integrated Health Delivery Systems in Rural Areas in Developing Countries." Unpublished paper. 12 pages.
- JACHOWICZ, Ryszard L., "Problems of Planning and Building of Health Care Facilities in Mongolia." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 11 pages.
- JAENISCH, R., "Some Aspects of the Development of Institutions for Outpatient Medical Care." World Hospitals 11:158-160, Spring 1975.
- JORGENSEN, Thomas A., "The Rural Hospital in East Africa." World Hospitals 11:192-193, Spring 1975.
- KÄPLAN, Walter, "Planning and Building with Regard to National Health Planning Schemes and the Upgrading and Masterplanning of Existing Health Institutions." World Hospitals 11:143-146, Spring 1975.
- KHASSIS, Uri, "Building of Infrastructure for Health," unpublished paper. 14 pages.
- KING, Maurice (ed.), Medical Care in Developing Countries. A Primer on the Medicine of Poverty and a Symposium from Makere. Nairobi, Oxford University Press, 1966. 400 pages.
- KLECZKOWSKI, B. M., "Health Care Facilities in Developing Countries--A Review of Problems from the Viewpoint of WHO." World Hospitals 11: 229-233, Summer 1975.
- KLECZKOWSKI, M., and R. Pibouleau (eds.), Approaches to Planning and Design of Health Care Facilities in Developing Areas. WHO Offset Publication No. 29, Volume I. Geneva, World Health Organization, 1976. 145 pages.
- , Approaches to Planning and Design of Health Care Facilities in Developing Areas. WHO offset Publication No. 37, Volume II. Geneva, World Health Organization, 1977. 145 pages.

- , Approaches to Planning and Design of Health Care Facilities in Developing Areas. WHO Offset Publication No. 45. Volume III. Geneva, World Health Organization, 1979. 149 pages.
- LANGSLOW, Brian, "Commissioning New Hospitals and Health Facilities." World Hospitals 11:104-107, Spring 1975.
- LEE, James A., "Health Needs of Developing Countries: The World Bank." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 10 pages.
- LIBERAKIS, Argyris, "Four Models and Their Prior under Restricted Environmental Resources for Health Care." World Hospitals 11:147-149, Spring 1975.
- LIPPSMEIER, G., "Experiences of Hospital Planning under Conditions of Limited Resources." World Hospitals 11:164-166, Spring 1975.
- LLEWELYN-DAVIES, Richard, "Planning Health Facilities in Developing Countries-- Some Case Studies and Their Lessons." World Hospitals 12:159-163, 1976.
- MACH, E. P., "The Financing of Health Systems in Developing Countries: Discussion Paper." Social Science and Medicine 12:7-11, 1978.
- MANN, George J., "Recommendations for Improving Health in Developing Countries and Practical Experience with the Planning of New Teaching Hospital in South East Asia." World Hospitals 11:183-188, Spring 1975.
- , "Rural Health Facilities in the Developing Countries." World Hospitals 15:129-131, May 1979.
- MEDICAL COMMITTEE OF THE CONFERENCE OF MISSIONARY SOCIETIES in Great Britain and Ireland. A Model Health Center. London, 1975. 61 pages.
- MEIN, Philip, "Planning and Building Health Facilities under Conditions of Limited Resources." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 20 pages.
- , "Rural Medical Buildings in East Africa." World Hospitals 11:194-196, Spring 1975.
- MEIN, Philip, and Thomas Jorgensen, Design for Medical Buildings. A Manual for the Planning and Building of Health Care Facilities under Conditions of Limited Resources. Nairobi, University of Nairobi Housing Research and Development Unit, in association with African Medical and Research Foundation, August 1975.

- MERRILL, Malcolm H., "Planning and Organization of Health Care Services," World Hospitals 11:68-72, Spring 1975.
- MORLEY, David, Paediatric Priorities in the Developing World. Boston, Butterworths, 1973. 470 pages.
- MUTISO, D., P. Brown, and S. Kanani, "The Design, Building and Operation of Health and Hospital Care Facilities in East Africa with Examples from Kenya." World Hospitals 11:189-191, Spring 1975.
- NAVARRO, Vicente, "The Underdevelopment of Health or the Health of Underdevelopment: An Analysis of the Distribution of Human Health Resources in Latin America." International Journal of Health Services 4:5-26, 1974.
- NILSSON, N., and T. Roneus, District Hospitals in Kenya: Type Drawings. Final Report for the District Hospital Planning Group. Goteborg, Sweden, White Arkitekter AB, December 1975. 32 pages.
- OFFICE OF INTERNATIONAL HEALTH, Office of the Assistant Secretary for Health, Public Health Service, DHEW, Guidelines for Analysis of Health Facilities Planning. International Health Planning Methods Series No. 5. Washington, D.C., U.S. Government Printing Office, 1979. 82 pages.
- , Selected Bibliographies and State-of-the-Art Review for Health Facilities Planning. International Health Planning Reference Series No. 6. Washington, D.C., U.S. Government Printing Office, 1979. 43 pages.
- OLGYAY, Victor, Design with Climate: Bioclimatic Approach to Architectural Regionalism. Princeton, N.J., Princeton University Press, 1963. 190 pages.
- OZGUNER, Orhan, "The Organization of Design--Phase Alternatives in Designing Methods." World Hospitals 11: 96-97, Spring 1975.
- PAN-AMERICAN HEALTH ORGANIZATION, Final Report and Background Document of the IV Special Meeting of Ministers of Health of the Americas in Washington, D.C. 26-27 September 1977. Washington, D.C., 1978. 51 pages.
- PARKER, A., "Health Technology and Primary Health Care." Social Science and Medicine 12:29-41, 1978.
- PEREGRINO-BRIMAH, Najab, "A Step in Sanitary Planning for Developing Countries." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 11 pages.

- PIBOULEAU, R. F., "Introduction to National and International Exchange of Knowledge and Experience." World Hospitals 11:63-64, Spring 1975.
- , "WHO Study of Planning, Programming, Design and Architecture of Hospitals and Other Medical Care Facilities in Developing Countries." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975, New York City. 6 pages.
- PUTSEP, Ervin P., "Some Thoughts on Scheduling Design and Building of Health Centers and Hospitals to Be Used for Medical and Paramedical Teaching." World Hospitals 11:169-173, Spring 1975.
- RADTKE, Arnold, "Planning and Building of Health Institutions--The Viewpoint of the Medical Profession." World Hospitals 11:114-116, Spring 1975.
- RANSOME-KUTI, Olikoye, "Innovations in Child Health Services in Nigeria." World Hospitals 15:194-198, August 1979.
- RATOPOORT, Amos, House Form and Culture. Englewood Cliffs, N.J.: Prentice-Hall, 1969. 135 pages.
- RICHTER, Hildegard Bromberg, "Planning and Building of Health Care Facilities in View of Operational Techniques--The Supply System." World Hospitals 11:124-128, Spring 1975.
- ROEMER, Milton I., Evaluation of Community Health Centers. Public Health Paper No. 48. Geneva, World Health Organization, 1972. 42 pages.
- ROEMER, Milton I. (ed.), "Rural Health Programs of Different Nations." Health Care Systems in World Perspective, Chapter 27, pp. 169-175. Ann Arbor, Health Administration Press, 1976.
- RONEUS, I., and L. Hanson, Rural Health Facilities in Kenya: Type Drawings. Final Report of the Health Center Planning Group. Goteborg, Sweden, White Arkitekter AB, February 1978. 31 pages.
- ROSCHIN, A., "Building Medical Care Facilities under Conditions of Limited Resources--A Phased Method of Bringing Them into Operation." World Hospitals 11:142, Spring 1975.
- , "Some Solutions to the Problems of Planning Flexible and Coordinated Health Care Facilities under Conditions of Limited Resources." World Hospitals 11:243-245, Summer 1975.
- ROSENFELD, E. D., "Limitations on Programming for Health Facilities in Various Developing National Situations." Paper delivered at the World Trade Institute/Columbia University Conference on Health Facility Planning and Design in Developing Countries, December 3-5, 1975. 13 pages.

- SAHL, R. J., "Priorities in Planning and Organization." World Hospitals 11:55-58, Spring 1975.
- SHARON, A., "Planning and Building of System Hospitals in View of Building Techniques and Climatic Factors." World Hospitals 11:135-141, Spring 1975.
- SHASTRI, J. D., "Physical Planning and Primary Care: The Problems of Developing Countries." World Hospitals 14:154-156, August 1978.
- SHERIFF, Maria Perez, "Calculation, Tendering, Cost Control and Organization of the Building Phase." World Hospitals 11:98-103, Spring 1975.
- SKUPNJAK, B., and J. Sabljak, "Planning and Construction of Medical Facilities with Reference to Operational Technique." World Hospitals 11:117-121, Spring 1975.
- SMITH, K. P., "Practical Experiences in the Design and Construction of Teaching Hospitals in Countries with Limited Resources." World Hospitals 11:174-182, Spring 1975.
- STALDER, F., "Organization of the Pre-Design Phase, Operational Policies--Methodical Programming." World Hospitals 11:82-92, Spring 1975.
- STIPEK, Jaroslav, "Facilities for Outpatient Care." World Hospitals 11:150-157, Spring 1975.
- , "Models for Health Institutions and Hospitals to be Planned and Built under Conditions of Limited Resources." World Hospitals 11:240-242, Summer 1975.
- VOGEL, L. C., et al., "Operations Research in Outpatient Services." World Hospitals 11:129-134, Spring 1975.
- WEBER, Richard F., et al., Senegal, The ISine Saloum Rural Health Care Project. Project Impact Evaluation No. 9. Washington, D.C., U.S. Agency for International Development, October 1980. 67 pages.
- WORLD BANK, Health: Sector Policy Paper. Washington, D.C., February 1980. 85 pages.
- WORLD HEALTH ORGANIZATION, Alma-Ata 1978. Statements by Participants in the Plenary Meetings. International Conference on Primary Health Care, September 6-12, 1978, Alma-Ata, U.S.S.R. Geneva, 1979. 184 pages.
- YARME, Howard, "Flexible Health Care Facilities for the Developing Countries." World Hospitals 15:125-128, May 1979.