

**PRIMARY HEALTH CARE FACILITIES IN
BANGLADESH - A METHOD FOR PLANNING
AND DESIGN TAKING ACCOUNT OF LIMITED
RESOURCES, LOCAL TECHNOLOGY, FUTURE
GROWTH AND CHANGE**

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ABSTRACT:

This thesis attempts to derive an appropriate method of planning and design of Primary Health Care (PHC) facilities in Bangladesh. The constraints and strategies like limited resources, use of local technology, need for phasing and future growth and change are set as prime considerations for developing the method. A systematic and step by step approach is followed at each stage of development. The aim is to express the method and guidelines in a convenient form which will be useful for health facility planners, designers and users at each level of decision making, from inception to evaluation.

The First Chapter develops a clear idea about the existing situation through an overview of the country's health and health services with particular emphasis on PHC. It shows that PHC has been given priority in the health service planning of the country and various programmes are undertaken to fulfil that target. But there are a multitude of problems arising from existing approaches to planning, programming and designing the facilities. It appeared to be an appropriate stage to develop planning and design guidelines based on the grounds of policies and strategies undertaken and realising the problem areas and mistakes from past experiences.

Before evaluation and analysis of existing facilities, a first attempt was to investigate (Chapter Two) what constitutes a planning and design method, guidelines and guidance. Lessons are learnt from the experience of developed and developing countries, from reviews and analyses of different published material, guidance and research in the relevant field. Based on the acquired knowledge, a theoretical model is developed (Chapter Three) focusing 1) on the essential stages of planning and design, 2) methods, 3) the framework and structure of guidance. The aim was two fold. First to focus the study on particular areas essential for the guidance, and second to prepare a checklist of subject areas for investigation through field surveys so as to gather the required feedback information for future proposals.

To get a clear idea of the physical and functional aspects and successes and failures of the present approaches, an appropriate methodology is developed in Chapter Four for the survey. The methodology set the survey objectives, method of sample selection and outline procedure to be followed. The survey findings, presented in Chapter Five explore physical and functional aspects, the successes and failures in the provision of PHC services and facilities.

Based on the survey findings and feedback information the theoretical model is validated

through developing planning and design guidelines for PHC facilities in Bangladesh. The final outcome is presented in a systematic method in the form of guidance in two chapters. Chapter Six proposes the planning guidance outlining basic information on roles, services and functions, distribution, location and size followed by outline operational policies of Upazilla Health Complex (UHC), Union Health and Family Welfare Centres (UHFWC) and Health Post (HP). The planning and design strategy of limited resources are discussed in this chapter. Chapter Seven presents the design guidance. The strategies and design principles (e.g. growth, change, phasing, building size and shape, environmental consideration, use of local materials and technology and so on) and their design implications took shape in the design concept and design development. Common activity components in individual facilities are identified and presented in a convenient form which is hoped to be useful for the design team followed by exemplar activity clusters and individual facilities.

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LIST OF ABBREVIATIONS:

ADB	Activity Data Base
AFPO	Assistant Family Planning Officer
AHI	Assistant Health Inspector
AN	Ante natal
BNCG	Building Note Consultative Group
BIDS	Bangladesh Institute of Development Studies
BG	Board of Governors
CONCISE	Computerised Capital Intelligence Service & Exchange
DANIDA	Danish International Development Agency
DBS	Design Briefing System
DH	District Hospital
DHA	District Health Authority
DHSS	Department of Health & Social Security
DOH	Department of Health
DPT	Diphtheria, Polio, Tetanus
DRS	District Reserve Store
ENT	Ear Nose Throat
EPI	Expanded Programme on Immunisation
FFYP	First/ Fourth Five Year Plan
FP	Family Planning
FPC	Family Practitioner Committee
FPO	Family Planning Officer
FWA	Family Welfare Assistant
FWC	Family Welfare Centre
FWV	Family Welfare Visitor
GCI	Galvanised Corrugated Iron
HA	Health Assistant
HBD	Health Building Directorate
HBN	Hospital Building Notes
HBO	Hospital Building Operation Handbook
HBP	Hospital Building Procedure Note
HFWC	Health & Family Welfare Centres
HP	Health Post
HI	Health Inspectors
HTM	Health Technical Memoranda
HW	Health Worker
IHF	International Hospital Federation
IP	In-patient
IPD	In-patient Department
MA	Medical Assistants
MARU	Medical Architecture Research Unit
MCH	Maternal & Child Health Care
MCWC	Maternal & Child Welfare Centre

MLSS	Member of Lower Subordinate Staff
MO	Medical Officer
MOH	Ministry of Health
MOHFP	Ministry of Health & Family Planning
MOMCH	Medical Officer (Maternal and Child Health)
MS	Mild Steel
NCPC	National Council for Population Control
NHS	National Health Services
OP	Out-patient
OPD	Out-patient Department
OT	Operation Theatre
PHC	Primary Health Care
PHCU	Primary Health Care Unit
PN	Post Natal
POE	Post Occupancy Evaluation
PWD	Public Works Department
RCC	Reinforced Cement Concrete
RD	Rural Dispensary
R&D	Research & Development
REB	Rural Electrification Board
RHB	Regional Hospital Board
RHC	Rural Health Centre
RIBA	Royal Institute of British Architects
RMO	Regional Medical Officer
	Resident Medical Officer
SDC	Swiss Development Co-operation
SKAT	Swiss Centre for Appropriate Technology
TB	Tuberculosis
TBA	Traditional Birth Attendant
TH	Teaching Hospital
THC	Thana Health Complex
TT	Tetanus toxoid
TFYP	Third Five Year Plan
UFPO	Upazilla Family Planning Officer
UHC	Upazilla Health Complex
UHFPO	Upazilla Health and Family Planning Officer
UHFWC	Union Health and Family Welfare Centre
UNICEF	United Nations International Children's Emergency Fund
USC	Union Sub-centre
UK	United Kingdom
WHO	World Health Organisation

NUCLEUS: A Hospital Building System. The concept of Nucleus Hospital System is that it offers stage development of hospitals from a first phase of about 300 beds with the potential of expansion to about 900.

PART ONE

THE EXISTING SITUATION, THEORETICAL BASIS AND NEED IDENTIFICATION

Introduction

INTRODUCTION:

Background:

Facilities for the delivery of Primary Health Care (PHC) in developing countries have been an area of serious concern all over the world for several decades. The Government of Bangladesh has drawn up five years' plans to provide "Health For All by the Year 2000" in response to the Alma Ata Declaration (127). According to Government plans the proposed health care delivery system comprises four levels (i.e. Primary, Secondary, Tertiary and Specialised level) under a regionalised system of health care. The study area relates to PHC in Bangladesh.

Primary Health Care would form the core of the system and include diagnosis and treatment of common ailments and minor surgery along with measures for the prevention and control of parasitic, infectious diseases and nutritional deficiencies. The plan calls for the provision of PHC through one Health Post (HP) for 5-6 villages, one Union Health Family Welfare Centre (UHFWC) in each union (8-15 villages) for 15000 to 25000 persons and one 31 bed Upazilla Health Complex (UHC) in each Upazilla (sub-district) for 200 000 to 300 000 persons.

In reality few of these targets will be implemented within the stipulated time. Also schemes that are completed remain under-utilised. Fundamentally lack of an appropriate planning and design method has lead to design errors and inefficient functioning of existing facilities. These combined with a lack of money, manpower, equipment and the ignorance of the users leads to under utilisation of the existing facilities. There are no clearly set out planning and design guidelines and hence research for such buildings. In 1985 the Government stated that out of 341 UHCs started, only 100 had been completed. Thus PHC facilities are losing the confidence of the local people. This has led to the by-passing of PHC facilities and the over-crowding of secondary care facilities, a common phenomena all over the world. This results in an increased workload in urban hospitals ultimately affecting the

Introduction

quality of care for all.

Many of the health facilities were planned and built without any strategy for future growth and change and this has lead over time to unplanned additions and upgrading resulting in a falling-off of efficiency.

"There is a crying need for appropriate guidelines for all types of care" (51)

In summary, the lack of design data and methods and the urgency of the existing problems are the reasons for choosing the subject as an area for study.

Aims and Objectives:

To derive an appropriate method for planning and design of PHC facilities in Bangladesh. A theoretical model of planning and design guidance will be formulated from analysis of examples of other countries. This will then be testified through evaluation and analysis of existing PHC facilities. Based on the analysis the aim is to construct a practical and systematic approach to health facility planning and design emphasising the 'real world' constraints of functional suitability, phasing and future growth and change under conditions of limited resources and local technology.

The main outcome of the study will be:

1. A theoretical basis for planning and design guidelines developed from an overview of those used in other developing and developed countries.
2. Evaluation and analysis of existing facilities to test the validity of the theoretical model. This will result in the formulation of a planning guide including outline project brief for the range of PHC facilities which can be used as a base for future development.
3. Common activity components of primary care will be identified in order to develop model units which may repeat at different levels of the facilities. Thus to propose alternative layout proposals for each level of PHC facilities flexible enough to allow phased expansion from lower to higher levels when the need arises and resources are available.

Introduction

In order to research and derive an appropriate method for planning and design the following strategy for the programme is proposed:

Proposed Plan of Work and Methodology:

Stage I : General background, role of existing health centres, examples of PHC facilities in other countries followed by a systematic approach to develop planning and design guide for rural health centres in Bangladesh are covered within MA dissertation.

Stage II i.: An extensive literature search will be made to determine: the general background of health care emphasising PHC, health service strategy, role of PHC facilities in Bangladesh and survey methodology.

ii. A model of planning and design guidelines will be proposed from analysis of existing guidelines and examples from other developing and developed countries.

Stage III : Survey of existing facilities designed by Public Works Department (PWD) and private consulting firms will be carried out to test the theoretical model and to get feedback information. Samples will be chosen to cover typical upazillas over whole Bangladesh. The emphasis will be on establishing user's requirements, functional efficiency and adequacy of built environment.

Stage IV : From this study attempt will be made to develop outline project brief for PHC facilities. Based on all this information and analysis, common activity components will be identified to develop model units to allow phased construction. This will be followed by alternative design proposals for PHC facilities under conditions of limited resources, local technology showing scope for future growth and change.

The study has been divided into two parts. The first part (Chapter One to Five) covers the general background, a theoretical model based on overview and analysis of guidelines from other countries, survey methodology, evaluation and analysis of existing facilities. The second part provides the planning and design guidelines in two chapters. An attempt is made throughout the process to follow a systematic method for planning and designing PHC facilities in Bangladesh.

CHAPTER ONE

GENERAL BACKGROUND OF HEALTH CARE EMPHASISING PHC IN BANGLADESH

Chapter One

GENERAL BACKGROUND OF HEALTH CARE EMPHASISING PHC IN BANGLADESH

1.0 Introduction:

Provision for future health care, planning and design should stem from existing problems, priorities and the need of the population. Health facilities are containers for providing health services to people and performing functions set within the context of an individual country. This chapter deals with general background of health care, present health and health services, planning, design and construction of health buildings in Bangladesh with special emphasis on Primary Health Care (PHC). These are set out as a context for PHC facilities.

Health services are at present provided through different levels of care e.g. Primary, Secondary, Tertiary and Specialised. In the last two decades major emphasis has been put on the development of PHC facilities. All these services and facilities are mainly provided from the public sector. This study comprises public facilities only. Basic background information and country data are given in the Appendix A.

1.1 General Overview Of Country Profile, Health And Health Services, Planning/ Design/ Construction Of Health Care Buildings:

The rapid growth of population (2.7 % p.a.) and uneven distribution in urban and rural areas causes problems of proper distribution of health facilities. At present there is no relation between existing health facilities and the catchment population, also seasonally poor communication systems in rural areas reduce accessibility to the health care system. As 87% of people are living in rural areas better communication systems and a balanced distribution of health facilities are essential. Low per capita income and expenditure on health, limits both the quality and availability of services and facilities. Low rates of literacy and traditional and religious beliefs are also hampering the acceptability of health services. The referral system is not working properly due to ignorance from both the users and providers side. There is a need to improve overall socio-economic conditions and produce better job opportunity, together with

Chapter One

an improvement of the literacy rate by providing more educational services for children and night school for older people.

The demographic characteristics of a community are the essential components in the planning and provision of health care. A clear understanding of demographic characteristics is essential to determine need, demand and provision of health care.

In 1987 with a population of 107.1 million and 742.2 persons per square kilometer , Bangladesh was the seventh largest nation and one of the poorest countries of the world. The population doubling time is 26 years which shows a rapid increase of population.

The age structure of Bangladesh is dominated by the younger group. The percentage of the population under the age of 15 and above 65 is 44 and 4 respectively. The sex ratio of the population was 106 males to 100 females according to the census of 1981. (see Fig.1.1)

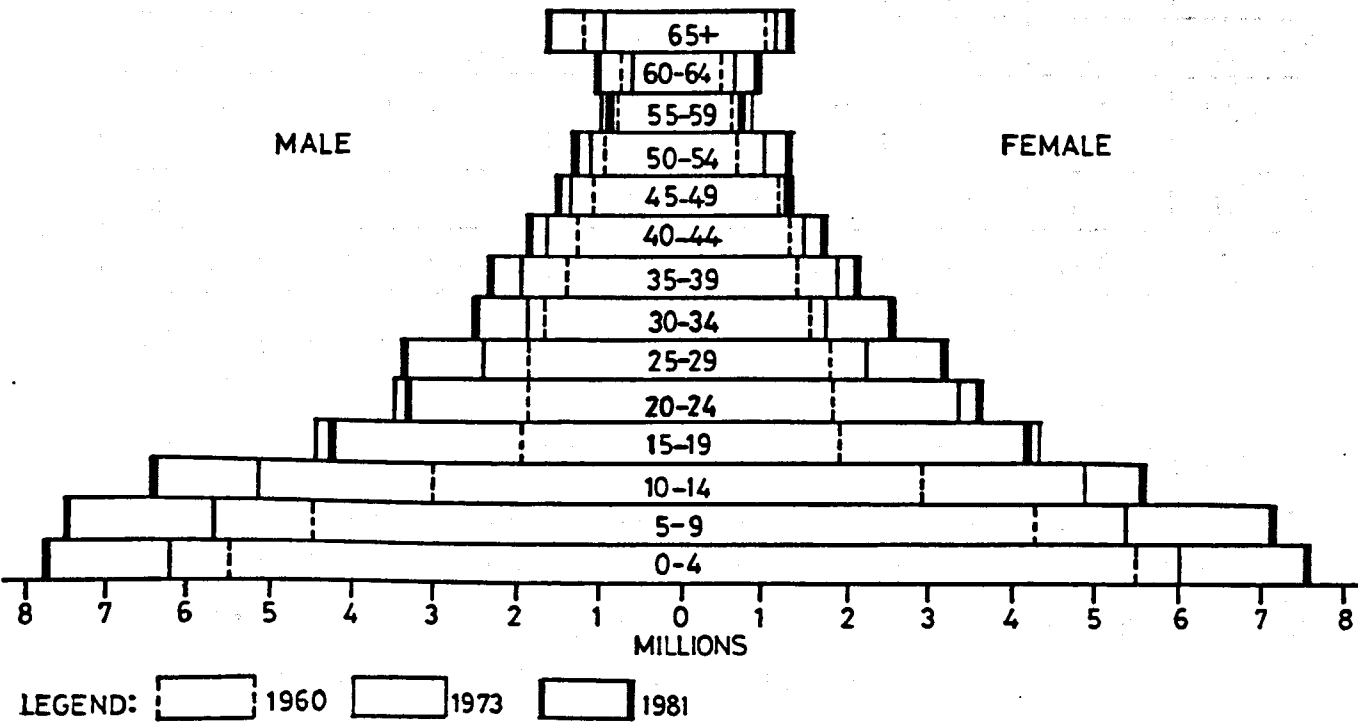


Fig. 1.1 Population by Age and Sex: 1960, 1973, 1981

Source : (42, 72, 102)

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Life expectancy at birth has increased from 45 years in 1965 to 50 years in 1987. In 1985 life expectancy of male was 45.8 years and female was 46.6 years on an average. The crude birth rate in 1987 was 44 and crude death rate was 17 per thousand showing the annual growth rate of 2.7 %. The infant mortality rate was 140 per thousand live birth and maternal mortality rate (the number of mothers die per thousand of live births) was 30 per thousand with the total fertility rate of 6.2. A comparison of demographic and epidemiological profiles among different countries is shown in the table 1-1:

Health Indicators	Bangladesh	India	Burma	U.K.	USA
Crude birth rate/ 1000 pop.	44.0	33.0	34.0	13.0	16.0
Crude death rate/ 1000 pop.	17.0	12.0	13.0	12.0	9.0
Annual growth rate (% per year)	2.7	2.1	2.1	0.2	0.7
Infant Mortality rate/ 1000 live birth	140.0	101.0	103.0	9.4	10.5
Total fertility rate/1000	6.2	4.3	4.4	1.8	1.8
Life expectancy at birth (years)	50.0	55.0	53.0	74.0	75.0

Table 1-1 Comparative Statistics - Health Indicators
Source : (116)

The demographic profile of Bangladesh indicates a high percentage of young and dependent population. The crude birth rate and infant mortality rate are very high compared to other countries. The country needs special attention to improve this situation. There is an urgent need for proper family planning programmes and an increase of acceptability of these programmes among illiterate populations of rural and urban poor.

The main causes of health problems in Bangladesh are a low level of nutrition and social economy which are further deteriorating due to the rapid population growth and high illiteracy. Malnutrition and infectious diseases occupy a high rate etiologically. Malnutrition is wide spread among children and expectant and lactating mothers. Over four fifths of the population are

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considered to be below the poverty level in terms of minimum caloric requirements (2020 calorie per person per day)(43). The average daily calorie intake per person in Bangladesh reduced from 1964 calorie in 1965 to 1899 calorie in 1985. Heavy rainfall during monsoon and inadequate drainage system accelerates the spread of communicable diseases. About one-fifth of the total admissions suffered from the group of conditions comprising injuries, accidents, burns and fractures.

Different health programmes and public health facilities should aim not only to treat commonly found diseases but also to promote preventive health care systems and self help with special emphasis to mother and child health care and need for an extensive immunisation programme.

There is a lack of finance, manpower and in some cases building resources in Bangladesh.

Financial resources:

There is a great scarcity of health resources in Bangladesh. The per capita expenditure on health is probably one of the lowest in the world. In 1976 it was only US \$ 2.00 of which only one fourth was spent by the government. The government expenditure had increased to US \$ 1.26 under the Second Five Year Plan (SFYP) 1980-85, and this is expected to further increase of US \$ 1.70 during the Third Five Year (TFYP) 1985-90 (51). Total expenditure as a percentage of GDP was 0.63% in 1981-82 and had increased to 1.07% in 1987-88.

Manpower resources:

The availability of health personnel such as doctors and nurses is also very poor compared to the developed countries and also many developing countries as shown in the Table 1-2. Nurses are most important component, especially where in-patient services are provided. Unfortunately the number of nurses available is only one per 19400 population compared to 4670 in India and 120 in the UK.

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Countries	Population per physician	Population per nurse	Beds per 1000 inhabitants'84
Bangladesh	9010	19400	0.3
Srilanka	7620	1260	2.8
India	2610	4670	-
Pakistan	3320	5870	-
U.K.	680	120	8-12 in industrialized countries of Europe

Table 1-2: Health Related Indicators for 1981 , Source: (51). Note: - = data not available

The Table 1-3, "The out turn of different health manpower and number of registered medical personnel" shows a rise in the number of manpower though still inadequate in world perspective.

Year	Medical College	Post-grad. med.inst	Register doctors MBBS,BDS	Regist nurses	Regist mid-wives	Regis. lady health visitors
1976	8	3	5723	1434	844	413
1977	8	3	6508	1739	930	413
1978	8	3	7035	2012	1041	413
1979	9	3	7909	2461	1167	432
1980	9	5	9188	3019	1353	440
1981	9	6	10065	3736	2239	449
1982	9	6	10333	4500	2934	473
1983	9	6	11496	5164	3424	475
1984	9	6	13500	5800	3850	450
1985	9	6	14591	6418	4399	-
1986	9	6	16090	6912	5199	1584

Table: 1-3 Out-turn of Health Manpower, Source: (42)

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There are extensive concentrations of doctors and nurses in urban areas. Majority of medical personnel try to stay in urban areas for urban facilities like school, college, private practice and other urban amenities. There is also an acute shortage of laboratory and X-ray technicians in rural health care facilities.

Bangladesh is not fully equipped with facilities for training and research in the various branches of medicine. The targets set within 3 year plan and achievements show only a small increase (4). It is necessary to enlarge and improve medical education facilities. Improvement of nursing education is also urgent to meet the need for adequate number and quality of nurses. The Government of Bangladesh has undertaken initiatives and training programmes to fill up this gap by producing mid level health workers, the Medical Assistants and Family Welfare Visitors, though the number is still inadequate to serve even the existing facilities.

Over 5000 registered practitioners practice traditional medicine, some of them are academically qualified and some are registered on the basis of experience. Most of them work in rural areas. About 6000 registered practitioners of the homeopathic system work in both rural and urban areas. There are private and public government recognised colleges of traditional systems of medicine, which impart diploma level courses.

Building resources:

Health facilities in the public sector consist of those under the Health Division of Ministry of Health and Family Planning(MOHFP) covering 23,306 (1986) and those under Government, Semi-Government and autonomous bodies such as Universities, armed forces, security forces, jails etc. covering 300 facilities (51). The former are open to all but the latter are only for those who are associated with the groups. (see Table 1-4)

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Year	Hospital Gov.	Hospital private	Governm. dispens.	T.B. clinic	Upazilla Health Complex	Maternity & Child W.C.
1976	131	n.a.	1724	44	151	91
1977	131	n.a.	1752	44	179	91
1978	388	36	1752	44	253	91
1979	405	36	1752	44	275	91
1980	510	39	1752	44	275	93
1981	512	164	1468	44	-	93
1982	544	164	1446	44	312	96
1983	560	164	1493	44	319	96
1984	568	164	1559	44	344	96
1985	596	164	1275	44	346	96
1986	600	164	1275	44	356	96

Table 1-4: Building resources. Source : (42)

There are also a number of hospitals in the private sector run either by individuals, groups, international organisations and missionaries.

There were a total of 760 hospitals in the country in 1984 of which 596 were in the public sector and the rest in private sector. The number of beds for every 1000 inhabitants in 1980 and 1984 was 0.48 and 0.3 respectively which is absolutely inadequate compared with 8 to 12 beds in the industrialised countries of Europe in 1981. The reduction in numbers of dispensaries is due their being upgraded and redesigned as UHFWC.

Resources are also unevenly distributed causing under-utilisation of some and over-utilisation of other facilities. Utilisation of existing health facilities in rural areas is very poor. Bed utilisation in rural health facilities is 40% as against 100% or over in urban health facilities. This is mainly due to the poor quality of services arising out of poor management, technical inefficiency coupled with gross inadequacy of supply of drugs, medical and surgical

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requisites. Thus rural health facilities are losing complete confidence of the local people. This has led to by-passing rural facilities and over crowding the urban facilities. Thus equitable distribution of limited financial, manpower and health facility is needed. Health manpower should be trained to work in rural areas for better delivery of health care to illiterate, poor rural population. A greater co-ordination of traditional medical practitioners, health auxiliaries, village doctors and also the community to be served is necessary.

Public Health Programmes are financed through general Government resources or by external resources. Country-wide resources are directed from the central government in Dhaka. There is no local or Regional mechanism for collection and distribution of resources. Total centralisation and lack of administrative direction have hampered efficient distribution of funds and thus many approved programmes remained immaterialized. A restructuring of financial allocation processes are essential to improve health status in cost effective manner.

The structure of the Ministry of Health is highly centralised and all Government health facilities and programmes bear direct responsibility to Dhaka, the capital city. According to Oscar Gish,

" Planning takes the form primarily of individual schemes having little relationship one to the other. For example, the doubling of medical school intake was undertaken even in the absence of any overall health manpower plan or a clear view of the future employment possibilities of the graduates, and major hospital expansion has taken place in the absence of sure knowledge of the capacity of the revenue budget to absorb the ensuing running costs of these institutions." (39, p.270)

There is a lack of organised data, adequate research, planning guidelines and standards in relation to health facilities. There is also lack of communication between user, client, planning and design team. Need to improve this situation is essential for proper development of health facilities in Bangladesh. Proper interaction, communication and programme between private, volunteer and public health services is also needed to avoid duplication of facilities.

The process of the five year development plans has been very slow and remains deficient in many aspects. There is a need to review the total process of planning based on adequate research, data and systematic procedure. Clearly with more resources many improvements would be made , but more resources depend upon the creation of wealth elsewhere in the economy. But

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there is also scope to make better use of the existing investment in resources.

Planning and design practices:

Locally financed PHC projects are mostly designed by the Public Works Department (PWD) under the Ministry of Health (MOH). The old UHCs designed before 1976 and the proposed 50 new UHCs after 1991 falls under this group. Foreign aided projects are designed by a number of private consulting firms which includes both local and foreign firms. The HES consultants (Hammett Rowe Norton Group Partnership, Engineering Consultants and Associates Ltd. and Sithapati Sangsad Ltd.), a consortium of one foreign and two local consulting firms, designed the type plans of a number of UHCs, UHFWCs and training centres after 1976. The selection of the firms depends on the aid giving organisations and to some extent on PWD. Planning and design for private health buildings are mainly decided by owner or private organisations.

There are no standard procedures to be followed by the designers of individual firms or PWD. Initially there were not even any guidelines or standards to be followed by the designers. They were only supplied with a project proforma stating type of building, gross area, bed number and specialty, number and category of staff and at best a schedule of accommodation. Only during the 1st and 2nd Population Project, an attempt has been made to prepare a Master Plan for PHC projects. This was prepared by the HES consultants where an outline was prepared for the proposed UHC and UHFWC stating their schedule of accommodation, cost, material, list of furniture and equipment, staffing and climatic consideration based on one standard type plan for each category. Later on four types of designs were developed for the UHCs, two of these with teaching facilities for medical students. These were built on different sites with little or no modifications.

Presently projects related to PHC are designed based on these standards. Unfortunately the basis for these designs and procedures followed were not recorded which could provide an insight to the needs and requirements of that time. Changes that has taken place after 10-15 years of operation are not recorded which can be incorporated in future proposals. In fact there is no

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attempt to update these once produced designs considering feedback information from existing buildings. The designers either use the whole building as standard type plan or for UHCs use the individual blocks of the building as standard and produce different layouts.

Usually a feasibility study, especially for foreign aided projects, is conducted prior to commissioning the project. After site selection a land use map is prepared by surveyors/ survey team arranged from consulting firms or PWD showing existing land use, contour, approach road and orientation. Site analysis is done by the designer, mostly without visiting the actual sites. The designers of PHC buildings mostly develop the designs based on personal experience, existing practice similar to any other public buildings or previous designs on health care. Most of the information are assumed by the designers on space standards and organisation. They remain unaware and uninformed regarding actual users of the facilities, nature of their work, operational policies, activities and their sequences, regional context, user's need, original intention and purpose of individual spaces. The designers have to determine detail building requirements themselves and get it approved in the joint meetings with other members from donor agents/ health ministry, PWD and Planning Commission.

The designers produce site plan, preliminary designs, detail designs with furniture layout and working drawings by themselves. Based on which other structural, service drawings and tender documents are produced.

Practically the designers, planners and users maintain no contact among themselves. Lack of communication causes problems like designers have to anticipate user's need and user's have to anticipate designer's intentions. As a result planning decisions have no relation to the user's need and provide inadequate information to the designers. The health administrators, clinicians and other users of the facilities have no part to play in the preparation of project brief.

There are no systematic procedures to be followed for recording data, collecting information and planning and designing PHC facilities. As mentioned in the Master Plan (8) that site visits were made by members from aid organisations, consultants and Government Departments, but no record is available in published form for planners and designers. Although money is spent and different programmes are undertaken by different organisations at different

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times, neither these are available for general use nor used by planners and designers for preparing future proposals. Moreover no feedback information is available and no physical survey is carried out from existing buildings to determine successes and failures, changes that have taken place and to determine new needs and demands.

Designers and planners are not supported by any current or published guidelines, guidance or design data for PHC buildings. For each new project designers either start from scratch or merely copy previous designs. There are no established standards and guidelines against which value of these buildings can be judged.

Standards and guidelines are essential to make the design process convenient and to develop logical designs. Although certain standards are recommended for hospitals, as for example bed distribution according to specialty, staffing pattern, floor area and so on, no such standards are available for PHC buildings. The only available standards are the type designs developed so far to be repeated in different sites. There lack thorough studies before developing these type designs.

Guidelines are not available on floor area, layout, room size and shape. No studies are undertaken on the type, number and sequences of activities to determine room size and organisation of spaces. Often inadequate and complete lack of information on the organisation of activity spaces, operational policies and proper project brief to guide the designers compel them to produce designs which do not serve the intended purpose of the buildings. Guidelines are not also available for location of the units within catchment area, accessibility, capacity according to population density, design considerations, standardisation of functional and circulation areas, service standards, furniture and equipment. For example all the UHCs and UHFWCs are assumed to be same size irrespective of catchment population. Growth and change are considered but without considering its nature, real growth plan and flexibility for changes.

If these designs need to serve the actual purpose and the time, money and manpower used in this area to be fully utilised, some efforts should be given to guide all these efforts and activities in a systematic way. This will not only serve present need but also serve as a ground work for future planning and design of PHC facilities.

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1.2 Health Service Strategy and Trends

1.2.1 History :

Ayurvedic was the earliest form of medicine since recorded history. Under Muslim rulers the Unani form of medicine was developed. Ayurvedic and Unani are the two prevailing systems of traditional medicine and both are based on indigenous herbs . Western medicine started during the British colonial period and was practiced side by side with the Ayurvedic and Unani forms of medicine.

In the 19th century a formalised health care delivery system was started. Health care facilities and training facilities for medical practitioners were established during that period. Historical evidence shows some of the present day hospitals were started as a dispensary and later on developed into a hospital (e.g. Pabna and Serajganj hospital) (51). The first medical school to train L.M.F. (Licentiate Medical Faculty) doctors started in 1889.

During colonial rule (1757-1947) a number of health facilities were established by local wealthy elites. Absence of central authority for planning and facilities provided by private, local and other public initiatives resulted in inappropriate size and distribution of these facilities.

After partition in 1947, during the Pakistan period, several preventive health programmes were undertaken i.e. Malaria Eradication Programme, Small Pox Vaccination and Cholera Inoculation programmes. The family planning programme was started in 1965. At the beginning of the Pakistan period the emphasis had been almost totally on urban based curative health care. Later in order to improve access of the rural population into the health care system, a few programmes were undertaken, which included construction of 4 to 10 bed rural health centres in each Thana (now Upazilla). The scheme was undertaken in 1961 to provide comprehensive health care service to every Thana through one Rural Health Centre (RHC) and three sub-centres attached to each RHC. The RHC would serve the sub centres administratively and functionally. By 1971 around 1200 Dispensaries and 151 RHC had been constructed. Along with these 8 medical colleges with an attached nursing school, a number of specialised hospitals and expansion and construction of sub-divisional hospitals were undertaken.

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After independence in 1971, the Government of Bangladesh formulated a new health care plan to complete many ongoing schemes. Different policies and programmes were undertaken under three Five Year Plans. A Thana Health Complex (THC) scheme was approved and the implementation commenced in 1972.

During the First Five Year Plan (1973-78), much emphasis was paid on building a network of THC, but hindered due to diversion of funds to other projects, financial constraints and construction difficulties. A revised project proposal for the THCs was prepared and approved in 1976. It was intended to provide 356 THCs, one in each of the rural thana and 1068 sub centres during FFYP period.

The Malaria Eradication Board was abolished in 1976 and all their activities including their domiciliary staff were integrated into the THC.

A review of statistics (59) of 1980 reveals that 290 THCs including 150 RHCs with 3800 beds were made operational, as against a target of 356 THCs with a total of 11036 beds. This indicates a target achievement of 84.3% for construction/ conversion of THCs and only 34.4% of operational beds. During that time 1990 health sub centres were in operation. The Second Five Year Plan envisaged to provide one Upazilla Health Complex in each of the 397 rural upazillas and one Union Health and Family Welfare Centres in each union.

1.2.2 Concept of Primary Health Care in Bangladesh:

Prior to the independence of Bangladesh, health care was mainly curative rather than preventive. After independence an endeavour was made to provide comprehensive health care emphasising rural health care. In response to the 1978 Alma Ata Declaration of "Health for all by the year 2000 " Government of Bangladesh has drawn up four Five Year Plans(1973-78 plus a two year extension plan, 1980-85, 1985-90 and 1990-95) which provides the planning frame work for health sector. The concept of Primary Health Care was started after First Five Year Plan following the Alma Ata declaration in 1978 which defines Primary Health Care as :

" Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and

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country can afford to maintain at every stage of their development in the spirit of self reliance and self determination." (127, p.8)

There is no formal document embodying National Health Policy.

1.2.3 Government Policies regarding Primary Health Care (43, 44), Objectives and Strategies for the three Five Year Plans:

First Five Year Plan (1973 - 78 and two year extension plan)

Broad objectives were the following :

- creating a rural health infrastructure
- strengthening Mother and Child Health services
- increasing the number of hospital beds
- developing training facilities

In 1976, 31 bed Thana Health Complex (now Upazilla Health Complex) was approved to emphasise rural health care and to provide comprehensive health care. The objective of the Two Year Plan (1978-80) was to provide "Minimum medical care for all". During the plan period a new category of field level personnel, the Palli Chikitshak or village doctor, one for each village was introduced.

Second Five Year Plan (1980-85)

- provision of primary health care for all.
- support for population control measures.
- training of health workers and their equitable deployment.
- strengthening of epidemiological surveillance and control of all communicable diseases.
- self-reliance in the production of basic pharmaceuticals.
- collaboration with other Government agencies concerned in the provision of safe water supply and disposal of waste.

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Third Five Year Plan (1985-90)

- to continue to provide PHC.
- to extend total support in the implementation of population control measures.
- to promote the development of appropriate health personnel to meet the need of the entire population.
- to strengthen and integrate national epidemiological surveillance.
- to improve specialised services.
- to strengthen legislative and administrative support for the elimination of spurious and substandard drugs and reduce cost.
- to encourage indigenous system of medicine
- to provide health care services to industrial workers -to encourage community participation
- to encourage intersectoral collaboration

Fourth Five Year Plan (FFYP, 1990-95):

The FFYP is drawn up to provide a comprehensive health and family welfare system capable of attaining Health For All by the year 2000 and a Net Reproduction Rate of One by the Year 2005.

The specific objectives include : improvements in health status of the population, particularly of mothers and children; strengthening of the Family Planning; impacts of health interventions; improvements in nutritional status of the population, particularly of mothers and children; improvements in the quality, quantity, and range of services at all levels of the health system, based on the PHC approach, including referral system; prevention and control of major communicable and non communicable diseases; strengthening of the management capabilities in the health system, including optimisation of manpower production, quality and utilisation; and promotion and strengthening of the health system and bio-medical research (40).

But the implementation process of the broad health objectives has been slow due to the lack of an operational plan delineating a specific goal-oriented programme ; lack of efficient

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administrative mechanism; lack of financial as well as manpower resources and also due to lack of government commitment to the health sector (72). (see Table 1.5 for different targets set for achievement by the year 2000)

Health care delivery		Benchmark	To be 1985	achieved 1990	by the 1995	year 2000
Health Posts	Each serving 6000-7000 people	-	-	2700	6500	13500
Union.H.Family W.C.	One per Union of 20000 people	1990	4500	4500	4500	4500
Thana Health Complex	One in each rural Thana	290	356	380	380	395

Table 1-5: Different Targets Set for Achievement by the Year 2000, Source:(10)

1.2.4 Health services and Health Organisation:

At present health services are delivered in three distinct patterns: (72)

- The centralised public system based upon the concept of the Regionalized Health Care with a system of referral from the small sub-centre all the way to the urban based hospital.
- Scattered private services ranging from community co-operative health insurance plans to individual private physician care, private clinics and nursing homes.
- Traditional services based upon folk beliefs and herbal treatment.

The public system :

The health care system in Bangladesh consists of four levels of care i.e. primary, secondary, tertiary and specialised health care built up on a regionalized model. Each of the regions with the teaching hospital at the apex of the organisation has similar facilities and is expected to be self sufficient as far as primary, secondary and tertiary care are concerned. (see Fig 1.2)

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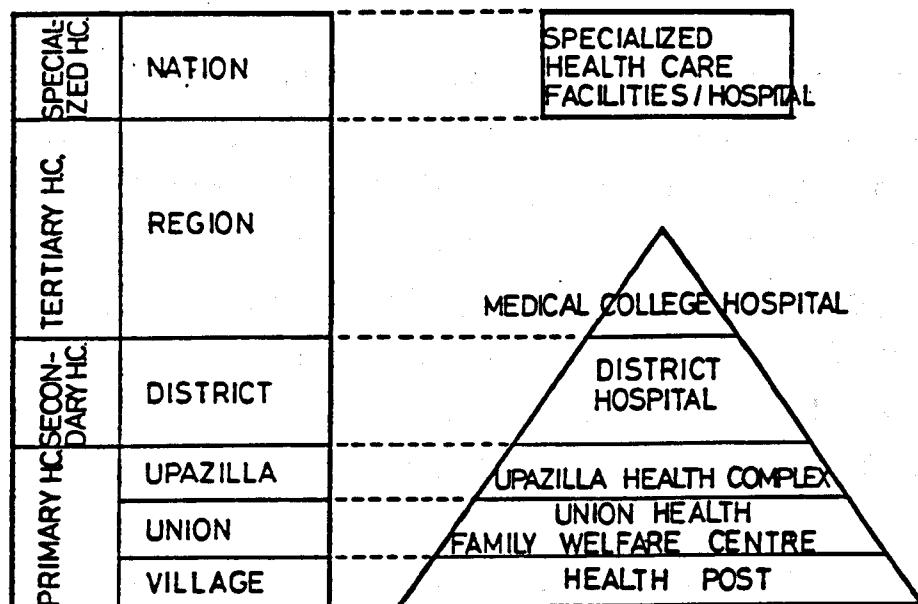


Figure 1.2 : Levels of care

Primary Health Care / Upazilla Level:

Primary Health Care, the nucleus of health care delivery system, is intended to provide promotion of health, prevention and control of parasitic and infectious diseases, mother and child health care and treatment of common ailments and minor surgeries at village, union and upazilla level. The health service plan for PHC includes 1 Upazilla Health Complex (UHC) for each Upazilla and 1 Union Health Family Welfare Centre (UHFWC) in each union and one health post (HP) for 5-6 villages.

Secondary Health Care:

Secondary health care is comprised of District hospitals of 100 beds for each district providing services in a limited number of specialties such as internal medicine, gynaecology, surgery, ophthalmology, paediatrics along with clinical pathology and blood transfusion and also act as referral centres for the rural facilities. Along with the district hospitals infectious and specialised hospitals such as T.B. hospitals, leprosy hospitals and mental hospitals also act as referral point of PHC. Civil Surgeon is responsible for District Health Administration.

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Tertiary Care:

Tertiary Health Care would mean a much wider range of specialties including among others radiotherapy, complex surgery and treatment for other difficult and complex ailments. These would be available at the Medical College Hospitals at the regional levels and the Post Graduate Institutes at the National level and act as referral centres for the district hospitals.

Specialised care in cardiology, nephrology, neuro surgery, cardiac surgery would be made available in hospitals attached to the teaching institutes. Specialised services for dental, chest, cardiac, diabetic, orthopaedic and cancer cases would be made available in existing institutions or near ones which would then act as referral centres for the teaching hospitals.

1.2.5 Catchment Population, Distribution And Referral System

Catchment population:

The catchment population for UHFWC and UHC is between 15,000 to 25,000 and 200,000 to 300,000 persons respectively. There are altogether 460 upazillas, 4,500 unions, 12,500 wards and 85,650 villages in the whole country. Four or five villages constitute a ward which is identified as the lowest administrative tier with a population of about 7000. Each village consists of around 1000 people . (see Fig.1.3)

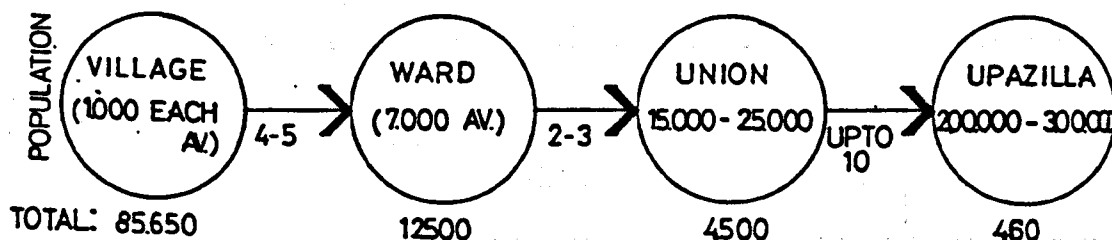


Fig.1.3 Catchment population

Distribution:

Following table 1-6 shows the distribution of health, maternal and child health and family planning facilities (1985-86) by districts:

Primary Health Care Facilities in Bangladesh

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Division/ Region, Former District	Population Density (in Sq. miles)	Number of UHC	Facilities Dispensary/ USC/UHFWC	FPC/ FWC/ UHFWC
CHITTAGONG DIVISION	-	86	210	328
Bandarban	-	2	17	9
Chittagong	1907	19	60	49
Chittagong H. T.	148	7	22	28
Comilla	2701	20	55	96
Noakhali	1810	11	31	76
Sylhet	1152	27	25	70
DHAKA DIVISION	-	89	197	337
Dhaka	3472	26	23	115
Faridpur	1793	21	38	52
Jamalpur	1896	9	18	35
Mymensing	1760	26	47	69
Tangail	1860	7	71	66
KHULNA DIVISION	-	76	128	256
Barisal	1656	24	27	53
Jessore	1584	16	41	74
Khulna	922	19	24	76
Kustia	1726	9	19	32
Patuakhali	1166	8	17	21
RAJSHAHI DIVISION	-	93	206	359
Bogra	1817	13	66	79
Dinajpur	1262	17	41	36
Pabna	1874	14	30	72
Rajshahi	1443	24	26	65
Rangpur	1757	25	43	107
BANGLADESH	1567	344	741	1280

Table 1-6: Distribution of Health Facilities by Districts, Source: (42)

Though policy decisions have been taken for even distribution of health facilities throughout the country, there is a wide variation in the number of facilities, catchment population, geographical areas and topography. The table 1-7 shows the comparison between several upazillas :

Upazilla	UHC: No of beds	No. of UHC	Area km2	Population 1981
Shibpur	31	1	205	200,000
Shakhipur	31	1	415	177,000
Debhata	31	1	169	81,000
Naikangchhari	31	1	453	28,000

Table 1-7 Comparison of Bed Number, Area and Population between diff. Upazillas Source: (51)

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Referral system:

Health care delivery system in Bangladesh has been developed based on the concept of Regionalization of health care. According to this concept health care delivery system will start at the household level and from health centres. Patients will be referred to upper level from primary to secondary followed by tertiary level according to patient's health need. Under referral system patients requiring complex medical treatment like major operations, long-term care and rehabilitation are referred to medical colleges and specialist hospitals rendering tertiary and specialised level of health care. (see Fig.1.4)

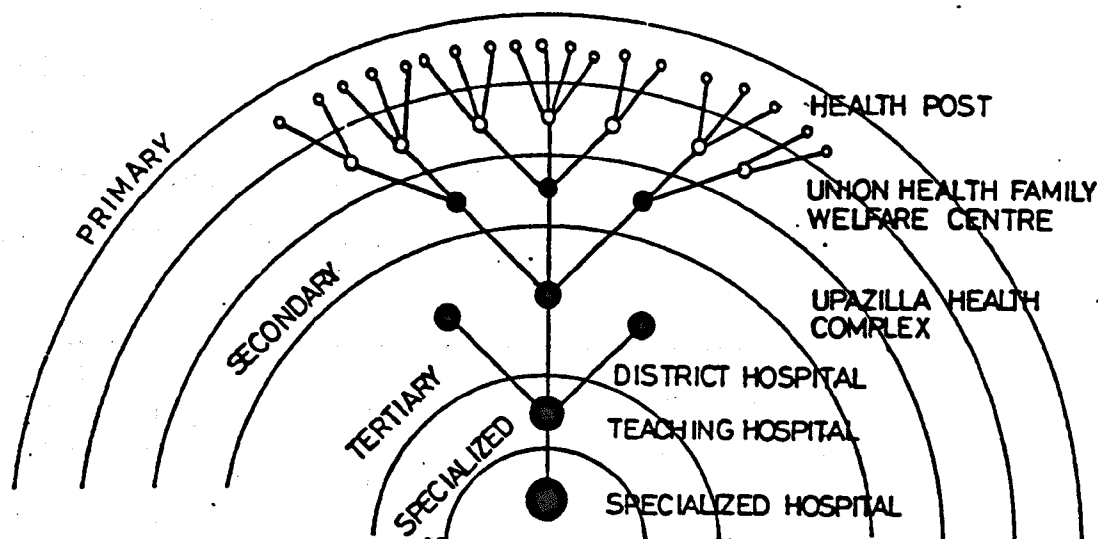


Fig. 1.4 Referral system

1.3 Primary Health Care Facilities And Their Role:

1.3.1 Different levels of care and position of PHC in the system

Health care delivery system of Bangladesh has four different levels for service delivery with the emphasis on Primary Health Care (PHC). These levels are as follows :

Primary Health Care Facilities in Bangladesh

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- 1. Primary :
 - a. Household / community level domiciliary services and rural health post.
 - b. Union level: Union Health Family Welfare Centre (UHFWC)/Sub centre, Rural Dispensary (RD), Maternal and child welfare centre (MCWC). Under different names, these are providing primary care.
 - c. Upazilla level : Upazilla Health Complex (UHC), the primary referral hospital.
- 2. Secondary:
- a. District level : District hospitals, the secondary referral level.
- 3. Tertiary:
- a. Medical college hospitals.
- 4. Specialised:
- a. Specialised hospitals.

The following figure (Fig. 1.5) shows different levels of care showing position of PHC facilities in the overall health care delivery system.

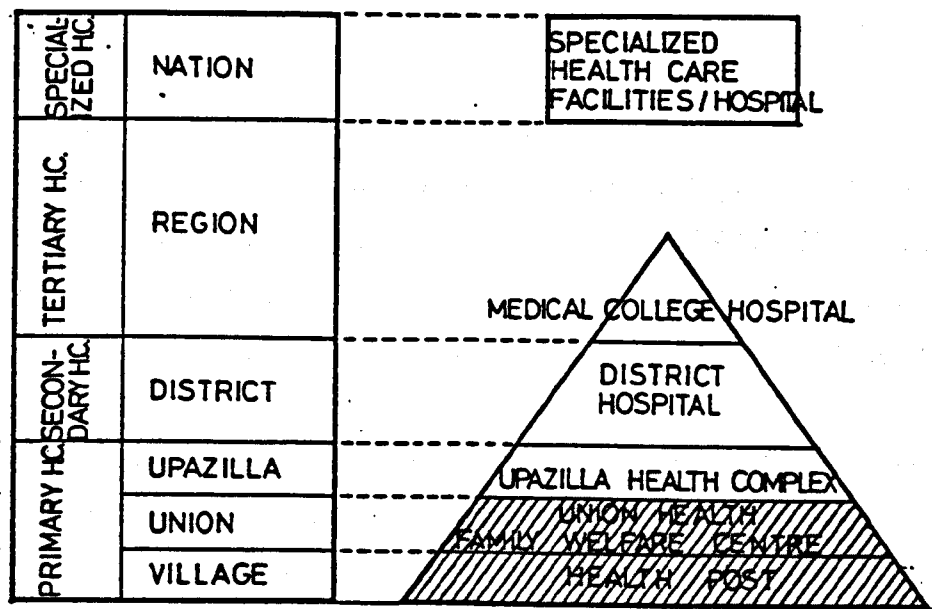


Figure 1.5: Levels of care showing position of PHC facilities

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1.3.2 Services and Manpower Of PHC Facilities

Services at Household Level (domiciliary services)

Services delivered at household level include the following :

- a. Health Education
- b. Family Planning
- c. Maternal and Child Health Care
- d. Immunisation and Control of Communicable and other endemic diseases.

Manpower:

The services are provided by two paid workers per geographical ward, one male worker known as the Health Assistant (HA) and one female worker known as Family Welfare Assistant (FWA). Only two workers for 7000 people are inadequate to provide efficient services. In a survey carried out by NIPORT (73), it was found out that the field level workers could hardly fulfil the jobs and number of visits assigned to them. They are expected to deliver both health and family planning services on domiciliary basis. The HAs are supervised by Assistant Health Inspectors and Health Inspectors and the FWAs by Family Planning Assistants based at health centres.

Service and manpower proposal for rural health post has not yet been formulated.

Services at Union Level : Union Health Family Welfare Centre

The services rendered at Union level are mainly medical care for treatment of common ailments, prevention of contagious diseases, Maternal and Child Health Care, Nutrition and Family Planning Services. All these services are provided through Union Health Family Welfare Centres and Rural Dispensaries, which are conceived as the first institutional health care facility.

Manpower:

The UHFWC is staffed by a medical assistant, a family welfare visitor, a pharmacist and a medicine carrier. The Assistant Health Inspectors and Family Planning Assistants use the centres for their official work along with field workers. Each RD is headed by one medical officer (MO) along with one medical assistant, a pharmacist and a support staff.

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Services at Upazilla Level: Upazilla Health Complexes (UHC)

The UHCs are intended to provide comprehensive health and family planning services with 1. out-patient services for general, maternal, child and family planning patients, 2. inpatient, 3. diagnostic and treatment and 4. domiciliary services by Health Assistants in health sector and Family Welfare Assistants in population sector. These are provided with 31 beds including 6 beds for maternity and F.P. patients.

Manpower:

Altogether 9 doctors are sanctioned for each UHC which includes one Upazilla Health and Family Planning Officer (UHFPO) who is in-charge of the UHC. Among them there will be 3 specialists in medicine, surgery and gynaecology, one medical officer for MCH services (MO-MCH) and one dental surgeon. The Family Planning side will be staffed with Upazilla Family Planning Officer (UFPO), Assistant FPO, Family Welfare Visitor (FWV) and the MO-MCH. The UHC will also have 2 laboratory technician and X-Ray technician, 1 pharmacist, 5 nurses and other paramedical and support staff to provide comprehensive health services.

1.3.3 Building Programme:

The Second Five Year Plan envisaged the establishment of one UHFWC in each of the 4,500 unions in the country by 1995. It is also visualised that by the year 2000 a mini health centre in the form of health post would be established in each of the three wards of a Union (10).

At the beginning of the Third Five Year Plan there were 2329 UHFWC, 347 UHC and 57 District Hospitals. Only 347 rural upazillas of the 397 had been provided with physical facilities at various levels. Of the original 87 MCWC's at different levels, 25 union level MCWC's were categorised as UHFWC and leaving the remaining 62 as MCWC. According to building programme (1980-85) the number of UHFWC would be increased to 2800 and another 250 UHFWC would be established through renovation and extension of rural dispensaries (9).

The following table (1-8) shows targets and achievements under subsequent development plan. These targets are seldom achieved within the stipulated time.

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	UHC: No. of facilities	UHC: No. of beds	UHFWC: No. of facilities
BENCH MARK(1972-1973)	151	900	Nil
FFYP(1973-78) Target	356	11036	1068
Built	225	2400	48
TYP(1978-80) Target	325	3800	442
Built	290	4811	1773 (a)
SFYP(1980-85) Target	356	11036	4500
Built	341	8813	2329
TFYP(1985-90) Target	460	11036	4500

Table 1-8: Targets and achievements, Source : (42, 51)

1.3.4 Cost :

Proposed Government Allocation For Health Care Under The Third Five Year Plan:

Programme Area	Allocation in Taka	% of total
1. PHC+ ancillary services	2750.80	30.02
2. PHC supportive programme	1295.70	23.56
3. Health manpower development	558.30	10.15
4. Hospitals+clinics	804.30	14.62
5. General	90.90	1.65
6. Total	5500.00	100.00

US \$ 1 = Taka 33/-

Table : 1-9 Proposed Government Allocation for Health Care under the TFYP

For health and family planning programme , dependence on foreign aid has increased from an average of 28.5 % during 1975-80 to 48.4 % during 1980-84 and 58.0 during 1984-88.

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1.3.5 Organisation and Management of PHC Facilities:(9,40,43,44)

Health and Family Planning Services are the overall responsibility of the Ministry of Health and Family Planning. The Government has decided to functionally integrate health and family planning services at the Upazilla level and below.

The National Council for Population Control (NCPC) chaired by the President of Bangladesh is the apex body for policy formulation, approval of programmes strategies and for providing policy guidance for Family Planning Services. Other Ministries (i.e. education, labour and agriculture) are directly concerned with the co-ordination and implementation of Family Planning Programmes. The separate Directorate General in the Family Planning Wing of the Ministry is supported by Functional Directorates responsible for operational aspects of the programmes. Offices at district and upazilla levels support the directorates.

By now 1,103 UHFWCs are under the supervision of the Director of Population Control and another 1,289 RD are run under the management of Director of Health Services. Dual administration persists in the management, control and supervision of the rural health centres.

1.4 Problem Areas Identified:

Different problem areas related to primary health care and the need to alleviate those problems are identified from previous studies and literature search . Classification of problem areas used in a joint UNICEF/ WHO study (38) have been used as broad headings.

1.4.1 Problem of Broad Choices and Approaches :

Community Participation:

There is a lack of community involvement in planning, organisation and delivery of health services. Community involvement is essential to make primary health care acceptable and accessible to the people and also in the assessment of need and evaluation of their success.

Training of health personnel:

There are 16 different workers delivering PHC at Upazilla level, trained in different institutions with different curricula and in different places. Evaluation of training programmes

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reveals serious technical and administrative problems, which cast doubts on its effectiveness or impact. These include the lack of selection criteria, poor training of trainees (FWVs), too broad and imprecise curriculum, insufficient practical training and unsatisfactory teaching methodology. Comments by the World Health Organisation are,

" Major problems concerning these categories of field level workers relate to inadequacy of training, supervision and management support. Lack of adequate career development opportunities, travel facilities and supplies adds to the dimension of the problem".(129, p.51)

The following needs are identified for the training of health manpower:

- more communication skills
- refresher courses and on the job training
- proper supervision
- inter-personal relationship
- a larger proportion of female workers. Curative care given by male workers often impedes female patients to avail care offered by them.

Poor coverage:

As against a 100 % Primary Health Care coverage targeted, only 30% of total population could be covered by facilities at the beginning of Third Five Year Plan.(54)

Expanded programme of immunisation could not produce significant results as the overall coverage is very low. The WHO/ UNICEF study (1977) made on the coverage of diarrhoea diseases shows that only 10% of 11,500 respondents consulted a Government facility at the time of serious illness.

Inadequate referral system:

There is no established and well-defined referral system. Patients are free to go to any level as they desire. This ultimately causes over utilisation of urban hospitals and under utilisation of rural health facilities. Problems related to self- referral give an unbalanced workload for any facility, over/ under utilisation of resources, mis-utilisation of manpower, wastage of time and money. These are merely organisational difficulties resulting from lack of proper supervision and delineation of individual activities. If patients were restricted from using higher level of services without screening /referral from local primary health care facilities, the

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problem could be reduced.

Under utilisation, accessibility:

Utilisation of rural health facilities is very low due to different problems related to accessibility (physical, social and financial) of the facilities. Long travel distance due to unplanned distribution and inadequate number of facilities is one of the reasons for low attendances. Poor transportation and communication systems cause more travel time. Due to long travel distance, time and expenses, villagers often prefer to go directly to District Hospitals or other hospitals for better service.

The majority of the rural health facilities lack necessary drugs, instruments etc. which force the health personnel to refuse patients. Ultimately patients lose confidence in these facilities and prefer to go to the higher level.

Culture and tradition also play a major role in reducing accessibility to the facilities. In muslim dominated rural society, female patients are often restricted from coming out of their houses and availing the facilities offered for maternal health care. Belief in traditional and religious healers is another cause of poor utilisation of the facilities. For example Mosley (2) reported that 2/3 of pregnant women refused to accept tetanus toxoid, even under home delivery. Bhardwaj and Paul (2) found that health sub-centres were rarely used by the parents of deceased infants.

Rudimentary service, ineffective medical care, peoples' culture, poverty and ignorance are the most common causes of under utilisation. To alleviate problems related to accessibility, special attention should be given to integrated health care planning and delivery of services and to locate the facilities within a referral system so that maximum utilisation of the facilities is possible.

1.4.2 Problem of Resources:

Manpower:

- inadequate health manpower both qualitatively and quantitatively
- due to shortage of manpower many programmes are omitted and domiciliary

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outreach services can not be extended.

Supplies:

- shortage of drugs
- medicine
- other essential supplies

Expenditure:

The trend in public expenditure in health care is such that the revenue expenditure in health and family planning to the total national budget has declined from 2.9% in 1985-86 to 2.42% in 1989-90 and development budget increased from 5.0% to 8.1% within the same year. The revenue budget determines the operation and maintenance of health facilities. More than 50% of the total allocation for health in SFYP (1980-85) were spent on PHC. Around 40% of all health and F.P. costs came from external funding mainly provided by WHO, UNDP, UNICEF, FAO, IDA, ADB and so on. Most of the external budget are spent on construction and personnel.

Facilities:

According to BIDS survey (1985), of the sample 12 UHCs which covered 111 unions, 39% of the unions had no sub-centre.(59) About 50 % of the existing centres were in bad condition, where 28.4 % of the centres were newly built, 12.5 % were in old structures remodelled, 6.8 % of the centres were currently under construction and another 6.8 % were remodelling from old structures. 60 % of the centres had inadequate number of rooms. There is a need to improve physical facilities.

1.4.3 Problems Related to General Structure of Health Services:

Lack of effective planning machinery:

Improvements in health care facility alone cannot bring total physical, social and mental well-being of people. Goals and targets have been set in the last three Five Year Plans, but following problems are identified :

- slow implementation of different primary health care projects.
- lack of overall/ integrated health policy covering all related sectors.

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-lack of planning and design guidelines and planners in the relevant field.

Weak development of the "total system" concept :

There is a lack of co-ordinated effort between government and other agencies and even different types of projects undertaken such as village improvement schemes. These different public and private initiatives have caused duplication or over emphasis in certain areas and neglect of other areas. An integrated approach of health care utilising simple and effective technology and inexpensively trained manpower for mass scale is essential. This requires sound managerial decision which is rarely evident.

1.4.4 Technical Weakness:

Health education:

Many of the diseases, specially childhood diseases, can be prevented through health education. Public awareness regarding health problem is important. Health education can be done utilising communities own resources like teachers, traditional and religious healers, agricultural extension workers etc. Health education should focus on environmental health like water sanitation and excreta disposal.

Need of basic sanitation:

Large percentage of rural population are without safe water. Solid waste disposal system is also rudimentary. Basic sanitation should aim at safe water, safe environment, un-contaminated food and a decent place to live. The development of sanitation measures should be linked with economic and social development and community action.

Poor transportation and communication:

Health care delivery is affected by poor transportation and communication. Roads in rural areas are mostly unpaved and become inundated during rainy season. The situation impedes not only patient's attendance but also staff movement, delivery of outreach services , supervision of health personnel, consultation and referral services. Due to lack of proper supervision staff feel isolated and neglected.

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integrated planning of services, more effective use could be made of the existing system if the quality of management at all levels in the system could be improved.

With all these problems a system of priorities and option appraisal is necessary in order to develop a Health Care Programme.

1.5 Conclusion:

With a growing population and uneven distribution of population and facilities in rural and urban areas, the prime task is to improve the overall health situation of the population within the resources (money, manpower and facilities) the country can afford. It was primary health care which had been neglected for a long time and after liberation special emphasis has been given in this area in the country health plans and programmes. Though particular emphasis has been given to PHC, the facilities could not achieve the desired result. These could not still cover the whole population. Different problem areas relating to broad choices and approaches in health policy, allocation of resources, structure of health services and technical weaknesses are identified. To overcome these problem areas a fresh thought needs to be given to planning and designing these facilities so that the same problems will not repeat in the future.

CHAPTER TWO

OVERVIEW OF PLANNING AND DESIGN GUIDANCE IN OTHER COUNTRIES

Chapter Two

OVERVIEW OF PLANNING AND DESIGN GUIDANCE IN OTHER COUNTRIES

2.1 Introduction:

The purpose of this chapter is to review the planning and design methods and guidance from developing and developed countries so as to develop a theoretical model for PHC facilities. An enquiry was made into aspects like types of guidance, intended users, structure, format and to some extent content of guidance and methods used to provide planning and design of health care facilities with particular reference to PHC. The lessons learned would be useful to develop a clear understanding of the methods already tested and suggested, those that have undergone substantial development and to identify those parts that might have universal applicability and those areas that need to incorporate local variations.

At present no such published guidance is available for planners and designers in Bangladesh. In the absence of any specific guidance, it is considered important to acquire knowledge in this specialised area from the practical experiences, research projects and published guidance of other developing and developed countries. The developed country example chosen is the U.K. due to its ready availability and the knowledge gained during studies for MA in 'Health facility planning and design' at the Medical Architecture Research Unit (MARU), London. Among the developing countries those which have relevance to the study area and particularly directed towards PHC facilities are chosen, e.g. "Approaches to Planning and Design of Health Care Facilities in Developing Areas" by WHO, "A Model Health Centre" by Medical Committee of the Conference of Missionary Societies, "Primary Health Care Facilities in Developing Countries" by German Research Society. The design examples are selected from developing countries, mainly those covered under guidance section, to get a clear understanding of their impact on design method and guidance.

2.2 THE PLANNING AND DESIGN GUIDANCE IN BRITAIN

2.2.0 Introduction

The purpose of this section is to review the development of both planning and design guidance and the main methods used to promulgate it. The case for standardisation, scope for

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growth and change and the use of available resources and technology will be covered within the review section.

2.2.1 A brief history of guidance in the U.K.: (before 1948)

In 1930, The Report of the Departmental Committee on Hospital Standards (88) considered general standards, where they existed, for the structure, equipment and maintenance, staffing, method of heating, lighting and ventilation covering hygienic standards of public buildings including hospitals. The report included the number of beds per thousand population, type and size of hospitals, form of planning and individual department's planning and design. This was probably the basis for the later development of hospital guidance. In 1937 The Report of the Departmental Committee (88) covered the Construction and Maintenance Cost of Hospital and other Public Buildings provided by Local Authorities. It stressed the 'standards' and 'standards of accommodation' rather than the process of approving schemes or the cost reference. Guidance was given on internal communication, but no standard layout was recommended. Also no recommendation was given on the formulation of a building programme and the process of approving a scheme. Hence this report was concerned with ends rather than means.

2.2.2 Different guidance material and procedures/ methods used: (after 1948)

After the setting up of the National Health Service (NHS) in 1948, responsibility for planning and providing hospital services in England and Wales was given to 15 newly created Regional Hospital Boards (RHB) and Boards of Governors (BG) and the funds were provided and schemes approved by the Ministry of Health (MOH).

A. Hospital Building Operation Handbook (HBO):

The Hospital Building Operations Handbook (1953) was the first document after the passing of the NHS Act which addressed itself to the question of the approval of building schemes. This was in 9 parts:

1. Outline of Building Control Arrangements generally
2. The Hospital Building Programme

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3. Planning and Bye-law Controls.
4. Starting Date Procedures.
5. Definition of Capital and Maintenance Work.
6. Works Financed from Non-Exchequer Sources.
7. Housing Proposals-New Works and Conversions.
8. Materials.
9. Contract Procedures.

Section 2 is important for the first reference to building organisation and the approval process in terms of the ongoing and expanding expenditure of a hospital building.

The HBO set out that for schemes equal to or less than 10,000 pounds, no formal approval was required but above this level formal consent was required. The approval procedure incorporated four stages: Stage One covered the need and nature of the proposal and approximate starting date for a new or extension project; Stage Two covered the requirement to prepare and submit sketch plans and a cost estimate. After approval of Stage Two the scheme could proceed to Stage Three covering working drawings, bills of quantities and invitations to tender. In Stage Four, approval to accept the tenders was given. Guidance was also given concerning the cost of schemes and the preparation of a programme and the proposed provision was judged on a cost and area basis, no reference was made to operational data.

In 1961 the Minister of Health asked RHBs and BG's to submit proposals for capital developments over a ten year period in order to orient immediate need to the ultimate comprehensive pattern of health care and to determine priorities for development. This marked the beginning of systematised planning of a 'programme' of hospital building on a National scale. With a growing hospital building programme, the architect's department at the Ministry of Health (MOH) was enlarged and put, for the first time, under the control of its own chief architect. He decided to have an advisory cum standard setting service to RHBs and BGs backed up by a research and development (R & D) programme.

B. Hospital Building Notes (HBN):

The Hospital Building Note (81) series, which was a product of the R & D group was aimed at assisting hospital authorities including architects, doctors and engineers in the conduct and planning of a building programme and dealt with "the preparation of a programme, the

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assessment and control of the cost of building, the design of the various departments of a hospital and the relationship of one department to another"(81). The first three building notes

- are:
1. Buildings for the Hospital Service (1961) (81)
 2. The Cost of Hospital Buildings (1961) (82)
 3. The District General Hospital (1961) (83)

The HBN:1 comprised of the following sections and subsections:

- i. Preparation of a Building Programme:
 - a. Assessment of existing resources: data on existing RHB's hospitals were suggested to be included in this section.
 - b. Assessment of the need of an area: here area was considered to have direct relation to population served. Also study of bed needs and their number/ 1000 population was given importance.
 - c. Compilation of the programme : includes bed numbers providing a comprehensive service and supplemented by all the diagnostic and treatment departments including OPD's and casualty services. Here flexibility and some possible changes were indicated.
- ii. Schedule of Accommodation: suggested for setting the nature and extent of various departments.

It also includes a section on design-in-use and suggested a check list for information collection.

HBN:2 'introduced a method of assessing the cost of new hospital buildings, whether on new sites or as part of the redevelopment of existing hospitals' (88, p.24) and HBN:3' gave guidance on general design principles such as departmental relationships and overall area guides' (88, p.29). Other HBNs, each concerning an individual department, have the following content:

- i. Scope
 - ii. General considerations
 - iii. List of rooms
 - a. basic accommodation and functional unit
 - b. additional accommodation
 - iv. Description of rooms
 - v. Engineering services
- Appendices: critical dimension and ergonomic studies and calculation of functional unit e.g. bed nos., C/E rooms etc.

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The HBNs are prepared based on evaluation and analysis of existing premises and provides a common base for all architects to work saving briefing and approval time. Most of the HBNs are concerned with hospitals. Being large scale project each department is dealt in individual guidance and generated problems like integrating different parts together. There is a lack of guidance on whole hospital, communication, traffic, supplies and operational policies. Schedule of accommodation appears as a basic briefing documents in HBNs. Schedule of accommodation is necessary but not tight fit along with operational policies.

C. Hospital Building Procedure Notes (HPBN):

In 1963 on the strictly building front Wooster et al proposed a 'Plan of Work' for the building design team to use from inception to completion and evaluation (46). This was adopted by RIBA in 1964, modified by DHSS in 1971 for incorporation into its hospital building procedure and published essentially under the title of CAPRICODE (Capital Project Code).(46)

CAPRICODE is a management system and the key to sources of reference for all concerned with the planning of health care buildings and contains all the procedural and financial guidance issued by the DHSS in relation to the building programme. The DHSS's Hospital Building Procedure Notes first appeared in 1969. The individual notes of Capricode are: HPBN 1, Procedure; 2 & 3, Planning Policies and Assessment of Functional Content; 4, Site appraisal and selection of building shape; 5, the Development Control Plan; 6, Cost estimate and control; 7, estimating staffing requirements.

The procedure was divided into the following eight stages:

- | | |
|-----------|--|
| Pre stage | A. establish need and regional policies |
| | A. functional content, site and shape, cost and phasing |
| | B. programme, project policies, development plan, budget |
| | C. departmental policies, space and cost plan, room data, sketch designs, equipment and component lists, design cost |
| | D. detail design and specification |
| | E. contract and construction |
| | F. commissioning (concurrent with D & E) |
| | G. evaluation. |

Department of Health and Social Security (DHSS), RHB and Project Team were all to be involved with the procedure. While approval was needed from stage A to C, to save time and

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cost the project team could proceed with the project before formal approval was received (46). Associated with the reorganisation of NHS in 1974, Cruickshank was appointed in 1973 by DHSS to produce a report on improving the management of the hospital building programme. He suggested 6 stages : outline intentions, planning, design, contract and construction, commissioning and evaluation. He stressed on evaluation of design and method of evaluation to reduce the time spent on briefing and to use experience of professional staff (i.e. doctors, nurses etc.)

D. Other guidance:

The DHSS produced the following guidance other than those discussed :

1. Hospital Design Notes
2. Health Service Design Notes
3. Hospital Building Bulletins
4. Commissioning Manuals
5. Technical Memoranda.

By 1985 the DHSS Health Building Directorate (HBD), as it was now called, comprised teams of architects, surveyors, engineers and administrators responsible for standards and cost control in the NHS building programme. The objectives of HBD covered : (1) maintaining cost control and parliamentary accountability for procuring health buildings; (2) assisting NHS managers to secure value for money by performance monitoring and the promotion of Nucleus; (3) promoting integration of capital and service planning through development of strategic planning system; (4) setting cost effective standards in terms of space, environment and safety for health buildings; (5) ensuring that the facilities comply with relevant statutes and regulatory codes of practice.(28)

Health Building Notes'(HBN),originally known as Hospital Building Notes (1960), give guidance on the planning and design of new and existing health buildings. The purpose of the notes is to set out the standards of accommodation and services for health buildings giving information on the needs of a particular department or function. Cost allowances are also given based on exemplar designs using ergonomically tested activity data, and on standards of construction and finishes.

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These notes are preferred not to be used in isolation, rather supported by other relevant documents. They are accompanied by a Design Briefing System (DBS) notebook and supported by Activity Data Base (ADB) and Health Technical Memoranda (HTMs). They are the basis for the Departmental cost allowances. There are also four volumes of HBNs on the "Common Spaces" giving detailed design information on rooms that commonly occur in many departments, corridors and related spaces, vertical circulation and design requirements for disabled people.

Activity Data Base (ADB) (45) is a briefing guide for health building design teams and health administrators, designed to be used along with the relevant HBN. It comprises a range of activity data relating to each room or space:(45)

A-Sheets contain text information recording the functional and technical requirements of an individual activity space within a health building. Each A-Sheet lists B-Sheets stated for use in conjunction with it. (see fig.2.1)

ADB		ACTIVITY SPACE DATA SHEET		B0301
ISSUE NO: 5.0			DATE JAN 1989	
ACTIVITY SPACE NAME ADULT: SINGLE BEDROOM, ACUTE.				
ACTIVITY UNIT	1 BED/COT CARE:Piped medical oxygen and vacuum.			A26AM
SELECTION	1 BASIN:wash/clinical, shaving, towel rail. (seated user)			B27AS
	1 HOOKS:Hat & coat, wide spacing. 2.			C03DA
	1 CHAIR:Upright, stacking.			C04CA
FUNCTIONAL DESIGN REQUIREMENTS				
Facilities needed for the following activities				
a) Patient may arrive on foot.				
b) Patient may arrive in a wheelchair, on a stretcher trolley or in a bed.				
c) Transfer patient to/from a bed, stretcher trolley, or wheelchair.				
Personnel				
01 x Patient				
04 x Others				
Additional Equipment or Engineering Terminals				Qty
LAMP indicating call system (other than patient/ staff)				1
SOCKET outlet switched 13amp single				1
SOCKET outlet switched 13amp double				2
SOCKET outlet television aerial, single				1
SOCKET outlet telephone				1
RAIL, curtain, glazed screen/door vision panel.				1
RAIL, curtain, window.				1
RECEIVER, television.				1
Planning Relationships				
a) Close to staff base.				
b) Close to ancillary rooms.				

Figure 2.1 Activity Data Sheet:
A-SHEET, Source:(45)

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B-Sheet records the functional requirements of a particular activity (e.g. clinical hand washing) and both lists and illustrates the equipment or components needed to carry out such an activity.

D-Sheets are lists of all the components extracted from individual B-Sheets.

Design Briefing System (DBS), a series of documents for each department or function, is designed to be used by briefing team to identify user's requirement and prepare the design brief. The check list approach and frame work used is useful to consider organisational and planning options leading to a list of activity spaces or rooms.

A 'Computerised Capital Intelligence Service and Exchange' (CONCISE) supports the monitoring function by keeping information on the progress, cost and contents of schemes. CONCODE is another guidance for the procurement of building and engineering works and maintenance which sets out types of contract, tender procedures and regulations. The Works Guidance Index lists and describes all guidance on planning, design and maintenance of health buildings and so on.

The department felt the need for updating the HBNs to take account of changing needs, departmental function and technology.

Method used to prepare HBN:

The team working on each HBN consists of a chairman, secretary, doctor, nurse, architect, engineer and quantity surveyor. When necessary the team is supplemented by specialists from the relevant department. A Building Note Consultative Group (BNCG) is set up with the assistance of Regional General Managers to conduct the consultation process and this consists of NHS representative of all disciplines together with staff from the Department responsible for the management of the programme. There are two stages of consultation. The first draft covers policy, general design requirements and cost estimates and excludes engineering requirements and solutions, costing chapters and activity data list. The HBNs are accompanied by the appropriate DBS note. The draft HBN is circulated to all concerned for comment, later amendments are incorporated into the draft.

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E. Comments on the use of guidance:

In 1983 Medical Architecture Research Unit (MARU) was commissioned for one year to evaluate the DHSS 'Works Guidance' published for the NHS. The purpose of the evaluation (57) was to determine whether the scope, form and content of the guidance met needs adequately and to suggest ways of improvement. The range of guidance was collected from the "Works Index" (36). Information was collected at three levels: a. Regional teams of Officers, b. those involved in liaison between Regions and Districts for Capital Projects and c. District Project teams. They interviewed 96 respondents including Works Officer, Architect, Engineer, Quantity Surveyor, Treasurer, Administrator, Nurse (Capital Planning), Doctor (Capital Planning).

In general all respondents accepted the Works Group's role in producing and disseminating guidance and a number considered that without such a central body, duplication of effort by the Regions would result. Many of them felt that the large number of building guidance publications issued by DHSS "were too great and frequently bewildering" (57, p.4). Some of the guidance like Health Service Design Notes, Hospital Building Bulletins were rarely cited as reference documents or sometimes remained unknown to the respondents.

They also felt the need for Building Guidance to be kept up to date and suggested reducing the scope of its activities and concentrating upon ensuring that a smaller amount of guidance was kept relevant. About one third of the respondents raised the issues of status of out of date guidance material and draft guidance and whether it is mandatory or advisory. They suggested that the Department should issue statements regarding guidance status.

A number also questioned the role of DHSS and NHS in producing guidance. Around 25% demanded that the NHS be given a greater say in identifying needs for and production of guidance. The reason for this difficulty was identified as being problems of communication. The study group recommended that the NHS should be consulted to assign priority and need determination. They also recommended clarification of the status of building guidance and to revise partially out of date building guidance and thus to reduce time taken for updating.

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2.2.3 Guidance On PHC Facilities:

A. Official Published Guidance:

DHSS. Health Building Note 46: General Medical Practice premises (35).

This Health Building Note "aims to assist all those concerned in the design of premises for general medical practice in understanding the problems and principles involved in building, converting or refurbishing such premises." (35, p.3) The note is intended for the use by the General Practitioner (GP), other members of the Primary Health Care Team, the Architect, the Family Health Service Authority (FHSA), the District Health Authority (DHA) including Building Contractor.

The publication provides outline PHC policies and services, brief synopses of the work flows and systems of organisation in GP premises. It has suggested the stages through which a project should follow from inception to completion. To provide a clear understanding of the nature of the organisation it explained the following aspects of PHC in Chapter Two:

Primary Health Care:

1. The Primary Health Care Team
2. The Administration of Primary Health Care Services
3. General Medical Practice
4. Different members of the PHC team and their nature of work and responsibilities
5. The Organisation of Practice Services (including Consultation, Clinic, Class/ Group and Other). Under each service it covered scope of work, working process, sequence of activities, persons involved, requirements (e.g. privacy, confidentiality etc.)

Chapter Three discusses the step by step procedures required for building, improving or altering practice premises for a cost rent scheme from the feasibility studies to the occupation of the premises.

Step 1: Problem perception (the reasons for deciding the need for new or improvement of existing premises, problem identification and procedures to be followed and the persons involved with the activities)

Step 2: Option generation (to consider all viable alternatives in a systematic way and come to a single option and ' a strategy defined for the execution of the project' (35, p.14)

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Step 3: Option Appraisal (the objective is to ' identify the best option based on one site or building'(35, p.14). Also to assist the architect with a step by step procedure and building strategy and the GP with financial strategy.)

Step 4: Sketch Design (It will be based on a brief decided by GP, PHC team, Architect and FHSA. It will be considered as a part of the feasibility study and adjusted during the final design stage and afterwards financial arrangements will be made.)

Step 5: Scheme Design (Based on sketch design the architect and PHC team prepare detailed requirements for the brief. Detailed design should be developed in connection with other building professionals comprising material, finishes and overall appearance.)

Step 6: Technical Development (For approval under the Building Regulations and for builders to tender involves the production of drawings, schedules, specifications, calculations and other technical documents.)

Step 7: Building Works

Step 8: Completion (completion of construction certified by architect and commissioning of the building.)

Chapter Four considers the Briefing and Design Principles encompassing privacy and confidentiality, securing circulation and supervision, growth, change and efficient use of space. Spaces are divided into three distinct types:

1. Public spaces (e.g. reception, waiting etc.)
2. Clinical spaces (e.g. consultation, examination, treatment etc.)
3. Staff spaces (e.g. records, supply, disposal etc.)

Chapter 5 to 7 deals with functional requirements of the various activities covering the following information:

-scope of activities within the space, persons involved, sequence of activities and related spaces, space quality, environmental requirements, equipment and furniture, preferred size and shape and their underlying reasons for choice.

Sizing or Area guides for each individual space are covered in chapter 8 and Building Services like heating, lighting, ventilation and so on are covered in chapter 9. Several appendices

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are given on Sites and Buildings, the Building Team and Financial Feasibility.

The HBN 46 does not include any schedule of accommodation, room data or any exemplar plan as it is assumed that the premises may vary in size and organisation to large extent. Space planning is more emphasized than coming through operational policies. This has emphasized detail description of individual spaces, activities with less diagrammatical presentation. The advantage of this guidance is that the whole building is dealt in one guidance, which is handy and concise.

B. Other Research Projects/ Guidance

I. Cammock, R. Primary Health Care Buildings : Health Centres, Neighbourhood Clinics and Group Practice Surgeries: A Briefing and Design Guide for Architects and their Clients (17)

The handbook suggests an alternative method to planning and design of health centres taking account of user's need and future changes. It offers design guidance for primary health care buildings all over the world and a briefing method for health care buildings of all types. The health centre is defined here as a primary health care facility providing general medical, dental, mother and child care and other services like X-ray, physiotherapy and some out-patient consultant sessions. Though this definition of a health centre may not be appropriate for all developing countries.

The study is directed for the use of the project team consisting of G.P.s, dental practitioners, director of nursing services and of social services etc. from the centre including architect. For it's presentation the book used ' a common language of diagrams' (e.g. activity charts, link diagrams and activity sheets) for the benefit of both designer and users enabling easy communication between the parties involved.

The whole book is divided into four different parts covering the following contents:

- Part I:
 - a. Current activities and personnel.
 - b. Few basic activity sequence
 - c. Role relationship.
- Part II: Accommodation required for each activity and their underlying pattern.

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- Part III: Relationship of spaces and zoning.
Part IV: The future.

The sequence of activities are grouped according to the main participants as Clinical Sequence (professional staff and patients), other professional staff (with each other and with students and supporting staffs), non-professional staff with patients and their 'backstage' supporting activities. These are needed by the architects and users to determine user's intended and anticipated activities. These answer the question of 'what people will do'.

The study stressed the need for multi use of spaces by clinical sessions using timetable. It identified three basic patterns of activities in terms of space use i.e.

i) The personal care sequence: where patient is responsible for seeking help for individual problems. Here important consideration is given to appointment systems and privacy of consultations.

ii) The pipeline process: patients attending for routine tests, supervision or prophylactic care all following the same basic pattern e.g. ante natal care. Efficiency, hygiene and speed of service is given importance.

iii) The class: patients who need 'the stimulus of competition or the reassurance of discussion with others like themselves', e.g. parent craft - talks, films, demonstration. The need to accommodate varied activities withstanding wear and tear are stressed.

From the activities analysed it is suggested to provide list of accommodation for different activities, unlike the Official Design Guide, which was commented on as follows:

" They made no attempt to analyse the users' needs, or to forecast any changes likely to result from the merging of the previous types of accommodation. The release of funds for building was dependent on the acceptance of these recommendations, so architects and clients found themselves limited to a ready-made schedule of accommodation: their skills in briefing and design were neither required nor permitted any scope".(17, p.8)

The book demonstrated that data sheets can be constructed out of activity analyses each describing one activity from a sequence. The sheets are suggested to be used as a base for discussion and as a check list/ format for collecting information and stressed the need for their constant revision. The following information is covered in the data sheet: (see fig. 2.2)

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- 1. the required space
- 2. vertical and horizontal dimensioning of space.
- 3. direction of light source and access
- 4. environmental consideration.
- 5. services.
- 6. list of furniture and equipment.
- 7. participants.
- 8. duration and frequency of activities.

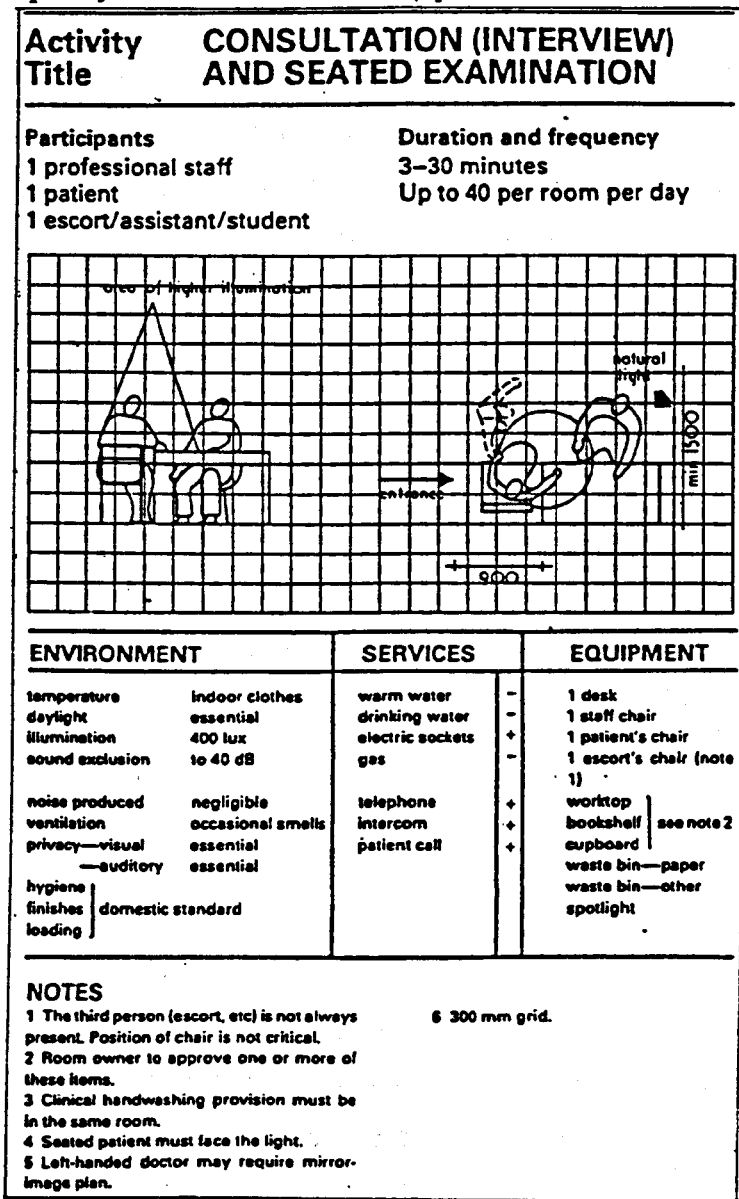


Figure 2.2: Data sheets, Source: (17)

In the part iii, the study stressed the need to distinguish between two kinds of health

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centre users, patients and staff, in the provision. Thus it has divided the activity spaces into three distinct zones: (see fig.2.3)

" The Joint use zone, including the individual clinical rooms, class room and reception areas. The Staff zone, including the stores, workrooms, communal rooms, cloakrooms and toilets. The Public zone, including the entrance lobbies, waiting areas, pram park and public toilets." (17, p.67)

It is felt important to consider the relationship between zones as well as within the zone. Inter-zonal relationships are discussed for smaller (A) to larger health centres (B and C) and their limitations. The smallest health centre have separate staff and public entrance to relevant zones and both communicate separately with the joint use zone. For the larger centres this relationships are constrained by the size and number of the joint use zone.

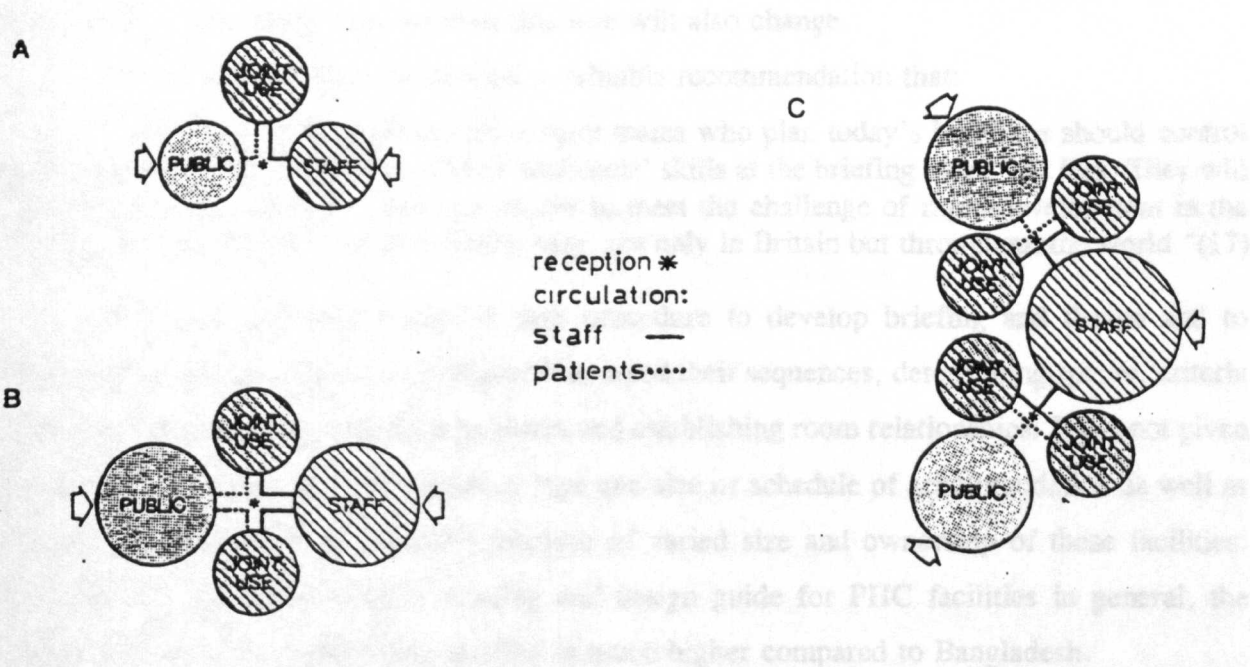


Figure 2.3: User zones, Source: (17)

Within the zone relationship several guiding factors like distance from waiting to clinical room are cited with diagrams or exemplar plans. It also preferred grouping of similar activities in order to enhance multi-use of spaces and to accommodate future changes.

The Part IV considered 'The Future' aspect in the planning and design of health centres. Three distinct aspects of changes are identified:

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1. Unchanging aspect: needs of the users as human beings such as environmental needs will be unchanged e.g. Temperature, Light, Sound, Ventilation, Team size, Reassurance, distraction and relaxation, Privacy, dignity and status.

2. Cyclical changes: changes which recur, either planned or predictable changes.

a. Planned changes

b. Probable changes.

3. Progressive changes: changes which continue in the same direction e.g. increase of catchment area for better communication. So the centre must be planned to accommodate the changes without disrupting the existing functions.

Team size is considered here under unchanging aspect. But due to changes in population size, medical technology and services this size will also change.

Ruth Cammock has put forward a valuable recommendation that:

" Surely the multi-professional project teams who plan today's buildings should control their costs by making more use of their architects' skills at the briefing stage, not less. They will after all, need all the skills they can muster to meet the challenge of rapid development in the provision of facilities for primary health care, not only in Britain but throughout the world."(17)

The book followed a step by step procedure to develop briefing and design and to determine future needs from analysing activities and their sequences, determining spaces, criteria of each space, preparing activity data sheets and establishing room relationships. It has not given any guidelines on location, distribution, type and size or schedule of accommodation as well as any exemplar plan. This is possibly because of varied size and ownership of these facilities. Although it is intended to be a briefing and design guide for PHC facilities in general, the standard of facilities, equipment, staffing is much higher compared to Bangladesh.

II. KEEN, J. WHITTLESTONE, P. SALE, R. Briefing Guide For General Practice Premises. (56)

The purpose of the document is to outline the stages involved in the execution of a cost rent project and to collect information regarding activities and spaces that the architect will use to design the new premises. The recorded information will thus act as a base for discussion with

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the architect and for design evaluation.

The document consists of four main sections:

Section 1 'asks for basic factual information about the parties who will be involved in the briefing and approval of the scheme as drawn up by the architects.' (56, p.1) e.g. name and status of persons in the client and decision making group. It is felt important to consider the best alternative in terms of site and design to convince the Family Practitioner Committee (FPC). This suggests option appraisal for site and building by owner consulting with FPC, District Health Authority and local planning authority.

Section 2 'asks for basic information about the practice, the staff employed and the services offered; this will be used in determining the numbers and types of rooms required by the practice.' (56) Such information covers present and projected size of patients and their characteristics; access to premises; present and projected staff.

Section 3 'asks about the particular policies operated by the practice, and describes the factors which have been found by MARU to be important in translating those policies into a working design.' (56) They suggest the recording of present and projected Operational Policies for future discussion. Three factors are considered important based on MARU research:

1. Privacy and Confidentiality
2. Patient movement and Supervision
3. Efficient use of space/ Growth and Change

The section also includes Monitoring and Preventive Services of GP premises covering information like list of services, clinical staff involved, length of session, frequency of session, present and projected operational policies, time table and finance.

Section 4 'asks for specific information that will be used in the design of individual rooms.' (56) The section covers Room layout and Interior Design, Location of rooms and distance preferred by users, Activities (list, spatial requirements according to nature of activities)

This has the advantage of using the checklist of important information needed to be collected from the users group.

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2.3.0 PLANNING AND DESIGN GUIDANCE FOR DEVELOPING COUNTRIES

2.3.1 WHO Publications of " Approaches to Planning and Design of Health Care Facilities in Developing Areas" (65 to 69)

Recognising the various problems and inadequacies of health facilities in developing countries, the World Health Organisation (WHO) has undertaken a comprehensive study (65) in 1972 of planning, programming, design and architecture of the facilities to bridge the gap between existing knowledge/ experience and their practical utilisation/ application. The studies were intended to assist decision-makers, health or public works ministers, health planners and architects in the following aspects:

- " defining a co-ordinated medical care facilities system within the integrated community health services;
- programming long term action to adapt, modernise, and co-ordinate existing medical care facilities, and to rationalise planning and construction of new institutions;
- planning individual medical care facilities in developing countries"(65, p.4)

It intended to make the team aware of limited resources (i.e. money, manpower, facilities), allocation of priorities, kind, type and location of facilities, phasing, use of reliable statistics and general pitfalls to be avoided.

The final aim of the study was to lay the basis for a health care facilities technology appropriate to developing countries in the form of clear and practical advice covering a wide range of topics from area-wide planning to equipment. The study recognised the fact that-

" guidelines are needed to promote the better use of scarce resources, distinguish those parts of developed technologies (1) that are suitable, (2) that can be adapted for developing countries, and (3) that are inappropriate and must therefore be replaced by a technology to be developed in the particular areas".(65, p.5)

A synoptic table has been used to cover the following areas:

- (1) prerequisites for planning
- (2) area-wide planning
- (3) tools for planning
- (4) planning of individual facilities

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- (5) planning of parts of facilities
- (6) construction
- (7) operation
- (8) case studies.

The contents of individual papers by different specialists from different countries cover practical advice in the field of planning and design of health care facilities and indicates the main pitfalls to be avoided.

The broad areas covered are (1) legislative and administrative framework (2) planning and programming (3) architecture and technique. The study was conducted with a hope to clearly set out "the steps to be followed, the facts to be weighed, and the components to be considered in order to arrive at a correct planning solution." (65, p.6) In the five volumes they have tried to cover a wide range of facilities, but for this study an attempt will be made to review and analyse those which are relevant for the planning and design of primary health care facilities. The main emphasis will be given to planning, programming, architecture and technology.

1. Prerequisites for Planning:

A. Legislation:

In the study by Bridgeman on " The importance of legislation and administration for medical care facilities with special reference to the developing countries" (13), the legislative framework is considered as a "dynamic instrument for development and a guide exerting a more or less firm restraining influence" (13, p.11). It's main aim is to serve as an inspiration for developing countries.

It is recognised in the study that there is no standard legislation to be followed by a developing country. In general it encompasses the following aspects:

- technical provisions concerning equipment and facilities.
- socio-cultural aspects i.e. male-female segregation, mothers staying in paediatric ward.

The administrative structure/ management of health care establishments should ensure all the supervisory facilities and executive powers and capability of implementing laws. According to his suggested method the standard legislation should comprise of the following sections:

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Section 1: Definition and Functions of Health Care Institutions.

Section 2: Ownership and Classification of Medical Care Establishments.

Section 3: Administration of Medical Care Establishments.

Section 4: Staffs of Medical Care Establishment.

Section 5: Financing.

Section 6: Relationship between Medical Care Institutions and other Health and Social Welfare Institutions.

Section 7: The Planning of Medical Care Institutions and Establishments.

Section 8: Medical Profession.

Section 9: Allied Health Profession.

Lastly the developing countries are suggested to proceed in stages starting with an outline law and gradually with more detailed ones to provide themselves with an effective legislative and administrative framework. Overall it stressed the need to fix the status, administrative structure, and functions of medical care institutions for the benefit of majority of the population and to prevent haphazard growth of facilities.

B. Standards :

The paper on " Standards and Technical Requirements" by Richter (106) deals with standards applied to health care facility buildings in developing countries. The meaning of standard and standardisation is covered in the following statement:

"Standardisation means the unification of materials, methods or equipment according to a predetermined model with exact technical specifications to be followed; standards indicate minimum requirements to be satisfied when action is taken towards a certain goal." (106, p.82)

It stressed the need for teamwork, who should set standards in a systematic way following several steps in a rational sequence. The methodology for preparing standards are outlined below:

1. Identification of Scope:

- a. decision on what should be regulated.
- b. which decisions should first be subjected to standards.
- c. by whom.
- d. under what conditions.
- e. what type of orientation required and most appropriate to desired action.
- f. whether broad guidelines or specific rules.

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The scope covers the kind of standard, priority setting, elements of standard, detail programme and time.

2. Data collection:

Collection of data using all background material, relevant statistics, books, manuals, regulations etc.

3. Analysis and research:

To assess applicability and implication of above suggestions and to search for alternative approaches, needs information gathered through observation, interview or through experimentation. These help to determine environmental conditions, behavioural patterns, customs, religious and ethnic factors and economic constraints. It also helps to decide which standards to be retained and which to be discarded; which are essential elements, dimensions and features and which are optional.

4. Graphic studies:

To list all movable and fixed equipment taking account of local, technical and economic possibilities. Data on equipment and traffic flow can be transferred to room data sheets to calculate minimum space required. It also suggested to use generic layout, traffic charts and functional sketches.

5. Preparation of draft papers:

- a. Introduction: explains specific approach.
- b. First chapter: scope of standard/ requirement and aim.
- c. Second chapter: explains terminology used in the text.
- d. Third: general requirements, stating functions/ activities in each unit, space required, basic equipment necessary.
- e. Other: specific requirements covering programming and architectural solutions.

6. Review of the draft text.

7. Approval and dissemination of the final document.

These are suggested to improve the quality of health care facilities in developing countries, to save cost and to provide a safe environment for patients and staff.

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C. Machinery for Planning:

While outlining Planning Team Machinery Moss (89) stressed that a procedural code is necessary for efficient management of a project. To complete a project within time and cost, all the stages need to be defined with target time. A number of countries including the U.K. have developed a capital project management code, the purpose of which is to "provide a 'route-map' through the project for all parties involved and at all levels; a series of stages in the development of a project are established and their relationship to generally applicable data pointed out." (89, p.75) This code, known as a plan of work and later under the code name "Capricode", divides the project into certain stages from inception to completion. But for its use and development it needs a great deal of expert knowledge and back-up data. In his opinion developing countries should develop their own capital project management code relating to their available manpower, technology and economy.

D. Training for planning:

The paper on "Education for Planning and Design of Health Care Facilities" by Moss (90) identified some of the desirable characteristics in planners and subsequently suggested a basis for the development of an education and training programme.

The gaps between the various design team professions would be filled in part by a common language, in part by a knowledge of the planning and design process, in part by theoretical exercises, and in part by practical experience.

E. Management of a building project:

Based on internationally accepted procedures Nilsson (94) has advocated some general guidelines for management of health facility projects in developing countries. The Project Management, as defined by him, is the process of planning, executing and controlling a project from inception to completion in a given time, at a given cost, for a given end-product in accordance with available technical and human resources. It is a continuous activity involving revisions, modifications and alternative solutions to new problems as they arise.

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The working process for a health facility project from inception to use of completed building involves different stages (i.e. briefing, design, construction and commission), various activities and involves many individuals and organisations. Parties involved in the working process, organisational structure and their inter-relationships and individual's activities/functions are clearly defined.

" By clear definition of the purpose of each stage, the tasks to be undertaken, and decisions to be reached, the entire planning process can often be shortened, a measure that can mean considerable savings." (94, p.226)

In order to define clearly the individual's responsibilities, functions/ activities in each stage, he proposed the use of check-list and included the following information for each stage:

- purpose of each stage.
- individuals/ organisations activities.
- participants/ individual team members.
- specific recommendations for each stage.

To organise management functions there is a need for 'Work Plan/ Programme' which should spell out the followings:

- how the various activities should be carried out.
- in what order.
- to what extent.
- in what way.
- by whom.

Thus the purpose of the 'Capital Work Plan' is to provide general guidelines within which the project teams could relate their tasks to those of their colleagues. It provides a definitive guide for clients and consultants regarding the procedures to be followed and identifying the points where consultations, cost checks and approvals are required.

In the planning stage he preferred the use of check-lists, bar charts, schedules and network plans showing interrelationships of different activities. Bar charts can be prepared as follows:

- "-make a check-list of the appropriate activities to be undertaken.
- analyse each item in the check-list, considering when, in respect to other activities, it

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needs to be carried out, and what length of time it requires.

-indicate all activities in chronological order on a time - schedule in bar-chart style."(94, p.234)

In the study an attempt has been made to define the various stages of project management i.e. planning, procurement and control in as much detail as possible under specific headings. The common structure is:

- clear definitions of objectives
- participants
- methods
- different activities/ tasks related to each stage.

F. Mechanism for community involvement:

The Global strategy for "Health for all by the year 2000"(63) adopted by WHO, specifies the role of individuals, families, communities, professionals and facilities delivering health care at primary and supporting levels and other sectors which have impact on health. It is felt important to ensure "social control of the development of the health infrastructure and health technology through a high degree of community involvement." (63, p.144)

The role of PHC facilities (i.e. health centres, front line hospitals etc.) will change the establishment of primary health care programmes and they should be integrated into community health care system with clearly defined functional requirements. The study "Humanisation of Health Care Facilities in the Light of Global Strategy for Health For All" (63) by Kleczkowski stressed the need to use local materials and skills to solve the problems of inappropriate brief, medical and construction technology, inappropriate training of designers/ foreign experts which caused expensive building and running costs. Different case studies show that community involvement through self-help projects was extremely helpful.

2. Area-Wide Planning:

A. Regionalisation:

Regional planning of health facilities is an important concept.

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"through its application, it is thought that construction of new hospitals, health centres, etc. can be tailored to the requirements of the users and that the necessary rational distribution of buildings will be obtained, enabling health services to be delivered according to a system in which different levels of complexity, adapted to the needs of the patients, can be distinguished and the point of entry to the health system can be identified." (12, p.10)

For its application there is a need for detailed study of the objectives and functions of the health system and the role of the health care providers (medical, nursing) and receivers (community and trade leaders).

"Co-ordination of institutional resources, administrative decentralisation, regionalisation and sectorisation to correspond with levels of care, functional programming and rational architectural design are the components of regional planning, which in turn is an integral part of the national planning of the health system." (12, p.10)

It has also been suggested by Alfredo Leonardo Bravo (12) that for preparing functional programme and architectural plan as a part of the regional planning process, one has to consider the following facts other than those mentioned already:

- best possible use of available scientific and technological knowledge.
- standards corresponding to average standards of living of the population served.
- appropriate referral system.
- services delivered by the "health team" of different professional, technical and auxiliary staff working at different levels and co-ordinated through an effective system of communication and supervision.
- dynamic and changing role of health care facilities.

These are suggested from the point of view of the health planners, while the architects views are given by J. de los Rios Mazure. His study (76) set forward a methodological guide for planning and programming of health care establishments. The approach is presented in three parts:

- (1) Phases to be accomplished,
- (2) Most important actions or activities to be performed and
- (3) Objectives to be attained.

Guidance is given in the following areas/aspects:

- optimum size
- organisational details

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- use of minimum resources and cost control
- plan for different stages of erection and equipping the building.
- staff training to establish requisite co-ordination
- administrative organisation for its operation
- provision of economic resources for its functioning.

B. Area-Wide Planning :

The groups and institution delivering health care services, according to Marian W. Miskiewicz (84), should be co-ordinated into an organisational and functional system.i.e. Horizontal Co-ordination: institutions delivering primary, secondary, and tertiary care to the population of a defined area, e.g. district or province.

Vertical Co-ordinations: organisations co-ordinated from one level to another e.g. national-regional-local co-ordination to control communicable diseases.

Both Area-Wide Planning and Functional Programming are the essential stages of the planning of health care facilities.

" Area-Wide Planning for medical care facilities is the part of health care planning that aims at the most effective distribution of facilities to provide complex medical care." (84, p.44)

It is a long term programming over not less than ten years. According to her suggestion the following factors are needed to be considered for area-wide planning:

- (1) available manpower:
 - a. number
 - b. type- available and projected
 - c. attitude and motivation.
- (2) utilisation:
 - a. expectation of the population
 - b. financial considerations
 - c. health or administrative policies
 - d. physical accessibility
 - e. behaviour of the medical and auxiliary personnel
- (3) socio-political conditions:
 - a. public administration
 - b. socio-economic development plan
 - c. public opinion
 - d. sociodemographic factors

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The scope of area wide planning includes number and types of facilities influenced by social, political and economic systems. The task of the planners is simple when the health care system is financed by the government or the social insurance system.

3. Tools for Planning:

A. The Planning Team:

In order to define the role and functions of the proposed hospital and prepare a programme, Moss (89) has suggested in his study "The planning team and planning organisation machinery" that one should consider establishing a small, compact and centrally located research unit. In his opinion a multi- professional planning team, consisting of doctor, nurse, architect, engineer, quantity surveyor and administrator, on the basis that their combined knowledge and experience can produce a loose-fit design capable of responding more easily with the changing medical, nursing and management requirements. It is an accepted fact that designing for flexibility requires a deeper knowledge of user's needs and it is the user's representatives of the team (i.e. doctor, nurse, administrator etc.) who can provide this knowledge.

One of the important tasks for the planning team is to prepare a detail brief which should spell out the followings:

- role of hospital
- scope of function
- operational and management policies
- schedule of accommodation
- environmental design
- cost target.

He also pointed out that when organising multi-professional planning teams to undertake project/projects, it is necessary to consider the following factors:

- the role and responsibilities of team members.
- the structure of the team.
- the position of the team in the building finance and decision making hierarchy.
- the development of a plan of work to ensure efficiency, economy and continuity.

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B. Functional Programming:

"Functional programming denotes the collection and analysis of information on all medical care facility functions and required services, and the drawing of conclusions useful for the design. It follows that the functional programme specifies the aims, scope and functions of the project." (84, p.48)

The following tasks of functional programming are identified:

(1) To define elementary (e.g. scrubbing up) and complex (e.g. preparations for surgical operations) functions as well as complete procedures (surgical operations from anaesthesia to recovery), and to describe all the different steps in each function and procedure.

(2) To explain the nature, scope, and forms of relationships between functional elements or groups of elements of a given facility, and to indicate where interactions occur and their extent. This may even entail clarifying the links between the facility under study and other facilities at the same or different levels.

(3) To adjust the architectural design of the facility according to the aims, scope, basic functions, and location assigned to the facility in the area-wide plan.

Allowances must be made for changes in epidemiology, demography, policy, services, role, medical science, technology, and so on to the programme. It should indicate precisely what should be done, where and by whom, by a team consisting of medical and design professionals. The medical professionals should explain functions to design professionals to help to formulate the best possible space use, relationship and communication pattern.

C. Standardisation and Rationalisation of Both the Process and Product:

The paper by Delrue on "Rationalisation of Medical Care Buildings in Developing Countries" (27) supports standardisation of both buildings and processes as against the concept of unique solution of individual buildings. He advocates to rationalise the process of functional programming, design and building of medical care facilities following a "System Approach". The aims and objectives are to provide a framework for developing the building programme and to propose some generic ideas for further development.

Modular Co-ordination, the key to systematised building, is suggested for use in

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standardising dimensions for open industrialised buildings. Here the co-ordinating dimensions of all parts of the building are multiples of one basic dimensional unit or module.

D. Type plans:

A type plan is defined as an arrangement of spaces to satisfy certain functional needs identified by the user and which can be repeated in different sites. The advantages of using type designs are to save cost and time to produce designs and drawings for individual buildings using skilled man-power. So that they can improve the quality of design by concentrating more on briefing and design stages. Cost can also be reduced by bulk ordering of materials and equipment for several facilities. It also in theory permits faster staff orientation when they move from one facility to another. It has several disadvantages too.

"Usually, type-designs are not sufficiently adaptable to meet regional variations in climate, local customs, building materials, and health service requirements." (62, p.10)

Several suggestions have been made to overcome the disadvantages of type plans (62, 6).

These are:

- to produce a range of sub-types of various sizes in order to avoid over building in sparsely populated areas;
- to construct and evaluate a particular type plan before constructing a large number to avoid mistakes in the first one;
- if any changes need to be made in the original type plan, a functional programme should accompany the plans in order to clearly understand the implication of design changes.

4. Planning of Individual Facilities:

A. The Front line Hospital:

Philip Mein has defined the role of Front line hospital as follows:

"The traditional role of the rural hospital has been that of the farthest outpost for organised health care to which the sick were expected to come. The modern concept of the front line hospital is that of a facility where some activities take place that could not be conveniently performed at another level or in different settings." (77, p.194)

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His paper "The front line hospital" (77) deals more with the physical facilities based on the "long life, low energy, loose-fit" concept, rather than socio-organisational aspect of health delivery system.

The setting/ location of the front line hospital should be based on geography, economy, climate, available material and communication network. The front line hospital should have PHC facility near to it and high quality medical care should be restricted for those patients for whom it is crucial. That is to say it needs a strict referral system.

A Project Brief is essential to provide relevant guidelines, a sound basis for suitable project planning system. The following stages are identified:

- (1) evaluation of the existing space use of the facility to determine whether it needs reorganisation, renovation, conversion or new construction.
- (2) appraisal of alternative solutions e.g. either extension of existing or new in a different site.
- (3) a detail brief is necessary for a new facility to define the overall goals and detailed requirements of the facility. In that respect a standard brief or programme may be used effectively as a basis for detailed programming.

The brief should describe the followings:

- the range of services that the facility is expected to provide.
- showing diagrammatically how these services relate to one another for patients/clients and staff.
- amount of services required on the basis of
 - a. catchment area.
 - b. epidemiological factors.
 - c. size.
 - d. population density.
 - e. available financial and manpower resources.

Thus to determine:

- a. number of patients/ clients to be catered for.
- b. number of staff required.
- c. size of waiting areas, service areas, inpatient facilities etc.
- d. diagrammatic layouts of the related spaces with dimensions for planning purposes.

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The brief will be given to the project planning team consisting of medical officer, senior nursing officer, hospital administrator, a member of local administration, a representative of the local population and building professionals. They will make decisions on location, size, construction standard of facilities.

B. Health Centres:

For the Planning and Design of health centres Abu Zeid Rajeh (101) has given emphasis to the following areas:

1. Survey of general conditions in the developing countries encompassing sociological change, demographic pattern, traditions, culture, religion and health, health conditions, environmental and public health conditions are considered the essential first step to determine.

2. The health centre in a co-ordinated system of health services: Here the Rural Health Centre is considered "as being that part of the front line of an overall integrated health programme where all curative, preventive and public health services are grouped together under one roof." (101, p.121) It should be co-ordinated administratively and functionally with other facilities at higher levels and also should have appropriate referral system. The health centre activities^{are} linked with education, social service, agriculture and co-operative society.

The next important aspect is to decide the size of health centre considering catchment area and population, its functions, co-ordination with other services in the area, available staff, means of communication and the system of co-ordinated health services for the entire region.

3. Functions of the health centre: Maternal and Child Health Services; School health programme; Family Planning; Nutrition; Control of communicable diseases; Launching mass campaign; Environmental health; Health education; Medical care; Maintenance of records for statistical purposes; Training activities.

4. Personnel and pattern of activities: Here important is to consider their availability, kind and duties/ activities in health centres.

5. Design and architecture of health centres

- a. Areas and spatial relationships: The grouping of closely related activities in one area

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and flexibility and expandability of the structural system is emphasized here.

b. Operational policies determining functions and related spaces, workload in each unit, number of staff, individual's output and the number of elements needed in each unit, flow of activities of users, administrative policy, supply system, room size and shape, and schedule of accommodation.

c. Architectural Programme

Among other factors site and location, building materials, climate and architectural character are emphasised.

5. Planning of Parts of Facilities:

This section covers Inpatient areas, Out-patient services, Operating departments, Laboratory and so on. As the areas covered are vast only Out-patient services are taken as an example which is common to all levels of PHC facilities, differing only in scale.

A. Out-Patient Department - L.C. Vogel (118)

This paper is intended for the use of out-patient department manager, the planner/administrator of the health services and the architect providing them with relevant operational and various other aspects of out-patient department. It can be used for designing new facility or re-designing an existing one taking into account limited resources, excessive demand for services, social, political and organisational constraints.

The writer also suggested to carry out specially designed survey and operational studies for collecting relevant information. The following requirements are identified as important:

Concepts, parameters and data base :

Concepts:

- a. The right of every citizen to health care
- b. Demand, utilisation and coverage: data required to calculate them are:
 - annual number of patients visiting the medical institution
 - distance in km from patient's residence to the institution

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- population of the catchment area

- size and population density of the catchment area

c. The flow concept: e.g.. patients are processed in a system where they attend one or more units arranged in a series according to need. This needs information to calculate daily workload per unit.

Parameters:

a. Operations: e.g. arrival pattern of patients, input-output rate per unit of time, waiting time etc.

b. Quality of care

c. Cost and efficiency

d. Expectation and satisfaction of patients.

Policy maker, health planner and administrator have to decide on population growth, expected demand, available resources and their use, patients expectation and their behaviour, operational policies, procedures and so on. This requires considering various "alternatives, determining criteria for choice between alternatives and deciding which to select." (118, p.54)

It is felt important to have a hierarchy of facilities and a referral system to make sure that everybody demanding care will get it at the level medically required. It also necessitates distributing service points to meet demand for primary care so that it is accessible to the people bearing in mind distance, travel time, communication and cost of transport. Demands, as suggested, can be estimated on the basis of catchment area, population density and expected number of visits per person per year.

The study offered a check list of information on Operational Policies, Administrative, Medical, Nursing and Technical procedures and Resources in terms of manpower, money and material. It stressed that the policies and procedures must be described explicitly at the Operational and the Supervisory level in manuals. For each operational unit (e.g. administrative, diagnostic, therapeutic units etc.) the functional analysis should include:

- A definition of the function of a unit;
- Daily and hourly capacity required;
- Service time;

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- Number of staff working in the unit at the same time;
- Tasks of various staff members;
- Flow of work and patients;
- Requirements of furniture and equipment;
- Layout of the unit, taking into account positioning of staff, patients and furniture;
- Required links with other units." (118, p.64)

The study also offered some elementary points to be included in the architect's brief and in the appendix, a check list for assessment of an out-patient department.

6. Construction:

A. Methods: Advanced building techniques and their utilisation in developing countries - W.F. Vetter (117)

The study describes the existing situation in developing countries and highlights the difficulties of adapting advanced techniques to the needs of developing areas. It sets forward some examples to show how the choice of advanced or local building technique influence health building design and stressed the consideration of local needs and construction possibilities.

The examples:

1. General Conception of Buildings : earlier construction with local technique suits better than the advanced building technique from developed countries which are costly and difficult to maintain.

2. Prefabrication: preferred for a large number similar units like health centres, but for large hospitals it will be difficult to remodel or extend with local craftsmanship.

3. Sources of energy: Solar energy, winds and tides- 'these unconventional energy sources are inexhaustible and their utilisation causes no pollution or refuse problem'. (117, p.118)

4. Ventilation and air conditioning: appropriate building orientation, layout and location of openings for cross ventilation allows economy and artificial means can be reserved for those parts where it is indispensable like the Operating Theatre (O.T).

5. Vertical construction: for developing countries horizontal or low rise buildings are preferred for cost saving, maintenance and to suit local custom and habits.

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It offered a valuable suggestion to choose 'the simplest and most economical solution, not only for the initial investment but also for running costs, and to avoid unnecessary elaboration in conception and realisation.' (117, p.119) It also suggested to evaluate existing building techniques periodically and decisions about levels of building technology to be taken at the planning stage.

b. Environmental Aspects: Influence of climate on Buildings- J. Shastri (111)

The influence of climate on design have been reviewed in this paper and an approach to construction proposed. The study discusses climatic elements (e.g. solar radiation and temperature, humidity, prevailing winds, clouds, rain and snow) and their effect on health buildings.

Use of vegetation, appropriate orientation of building, construction of walls and roofs, shading devices, location and number of openings, materials and wall thickness, are suggested, to be judiciously decided to attain comfortable conditions inside the building. The solutions will vary for different types of climatic zone: cool, hot-dry, hot-humid and warm-humid and best use should be made of buildings adapted to the local condition and climate. Choice should also be made of the elements (floor, wall, roof, opening of doors and windows), their material, finishes, durability and form of buildings to suit their micro- climate.

The study also suggests the following important findings:

- buildings to be oriented along an east-west axis in all climatic region, other than in cold and hilly areas where east-west orientation for sun light may be more desirable.
- in humid areas orientation towards the direction of useful wind.
- to create a favourable micro-climate through landscaping, grassing, paving, planting of trees and shrubs, constructing ornamental bodies of water, and creating sunny or shady areas.
- building forms should be according to climatic requirements e.g. square and compact for hot and arid areas, rectangular with wings and courtyards for hot-humid areas.
- thick walls and roofs, small openings, and minimum exposure to the west are appropriate for hot and arid areas. Light, thin walls and a similar kind of roof are better for

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humid areas.

- solutions according to actual use of different buildings and departments.
- building width and internal arrangement to get natural light and ventilation.

7. Operation:

This section covered commissioning, medical and surgical equipment, maintenance and engineering services, evaluation and so on. As the study aims to develop planning and design guides for PHC facilities, these areas are not included within this overview section. Examples from case studies are discussed in section 2.3.3.

The WHO guidelines concentrated on both the planning and design aspects covering all ranges of facilities and stages of work. The experienced practitioners and theorists have in the ensuing volumes, addressed themselves to questions which had previously not been documented. It is useful as a reference, but difficult to synthesise and use as a guidance. It has not maintained any order, in particular relevant to the stages of work. Thus repetition of information and overlapping occurred.

Here the factors given importance for developing countries differ from developed countries e.g. economy, efficiency, safety, social appropriateness, environment as opposed to strict privacy, confidentiality and so on.

These guidelines are applicable for Bangladesh in general and with local adjustment as it is intended for developing countries with limited resources and also as Bangladesh has adopted WHO policies for PHC facilities. All the papers stressed the need for local adjustment e.g. local needs and customs, climatic conditions, population usage as well as available manpower and equipment.

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2.3.2 CONFERENCE OF MISSIONARY SOCIETIES IN GREAT BRITAIN AND IRELAND. A Model Health Centre.(22)

The value of standardising buildings and methods in the planning of health care facilities in developing countries had been considered in the International Hospital Federation's (IHF) 17th International Hospital Congress held in Dublin in 1971. A special committee was formed under Dr. Andersen, who presented the idea of a Model Health Centre to the meeting of the medical committee of the conference of Missionary Societies. In 1972 in the U.K., under this special committee, a Working Party was set up to prepare a report covering the description of the Model Health Centre Building, its staffing pattern and their working procedure, lists of equipment and various other related factors. The Working Party met on twelve occasions and exchanged their views with specialist advisers.

The concept behind the Model Health Centre is that, due to the shortage of money and manpower a community may choose to establish a small clinic which will develop into a Health Centre with the growing population. This is only possible 'with careful forethought in the siting of the first building and the allocation of land.'(22, p.vii) According to the Working Party's opinion the Model Health Centre should serve a population of up to 20,000 people within a 10 to 20 miles of radius. It may also develop into a District Hospital with population growth and improved communication and transport facilities. In the report they also emphasised the need for individual local adaptation of the Model by 'translating the proposals carefully into practice.' (22, p.vii)

The content of the report covered under the following headlines:

CH I: The background, the Model, important areas for further study and the future.

CH II: A description of the Model plan.

CH III: The drawings.

APPENDIX: Covering whole range of activity areas (kitchen, waiting, wards etc.), equipment list, schedule of accommodation(present and future), staffing and their activities, evaluation, disease pattern, structure, cost, services, environment, future growth and change etc.

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In the first chapter they attempted to clarify : why the health centres are needed, their work and working procedure and what they should look like. Thus the aim of the study was to illustrate and describe a Model Health Centre in detail.

It is offered as a design primer and reference book for those engaged in planning, developing and operating health services whether at a national or local level. It also offered useful check lists of important attitudes and ideas. For omissions and additions much of the preliminary work in the appendix was offered for examination.

In Chapter II, the Model Plan has been described covering inter- relationships of different areas, basic organisation, illustration of plan with additional governing factors.

Chapter III explained the drawings and their use, size of building, construction principles, schedule of accommodations with detail plans. The way plans are explained indicates the use of plan by those who can not at all read a plan.

In appendices 1 to 13, the outline operational policies of different activity areas are given without following any structure. The following aspects are covered:

- definition of the area/ scope of work/ purpose/ aims and objectives.
- list of activities to be carried out in the space.
- location
- facilities
- operational policies.
- minimum requirements.
- staffing pattern and their workload.
- sequence of activities, link diagram showing patient flow, movement of people and goods.
- inter-relationships of departments.

Some aspects are covered in greater detail than others. For example, step by step treatment pattern and staffing activities. This possibly reflects the greater number of medical input with experience in developing countries in the Working Party.

The study also stressed the need for multi-use of spaces, shared facilities, shared staff, maximum use of less qualified staff reserving more qualified medical personnel for crucial treatment. It also offered a list for extended rooms and expansion options- typical possible

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extensions. The centre may develop into a 25 bed hospital which can be further extended to 125 bed hospital.

Flexibility, expandability, mass production and standardisation of buildings: The model design is based on definite relationships 'so that the buildings can be systematically expanded into larger centres and even to small hospitals.' (22, p.app.37) It did not support standardised building due to different problems i.e. transportation of parts, mass production (not feasible if it is less than 150 pieces), restricted size of individual parts and above all cost. Thus the Working Party had decided to-

"go for a small span building that uses simple materials, suggests pulling parts of the roof out to get more space, and puts the different parts into different buildings so that they can be expanded without interfering with each other." (22, p.app.37)

The plan suggests standards rather than a standard plan. The model plan is based on 16'x 16' structural grid, which can be constructed from locally available simple structural material (i.e. timber, bamboo or normal brick construction).

Guidance was also given to determine the number of people served, the distribution and grouping of centres and some wider planning problems. This assumed that the centre would serve 20,000 people and considered some other basic assumptions to calculate the above mentioned numbers based on their experience. In the calculation they stressed an important aspect:

"If an increase in the survival rate of children can be tied to a reduction in family size, and as a population gets older, centres originally established on an under five's calculation will be too big. This 'loose fit' should allow for expanding trade in adult out-patients. As out-patient treatment takes longer for adults than for under five's it is not unreasonable to hope that these varying factors will keep themselves in balance." (22, p.44ii)

Among other factors stressed was the need to consider population density, communication network (travel distance and time), geography etc.

Regarding distribution they suggested the following model:(see Fig. 2.4)

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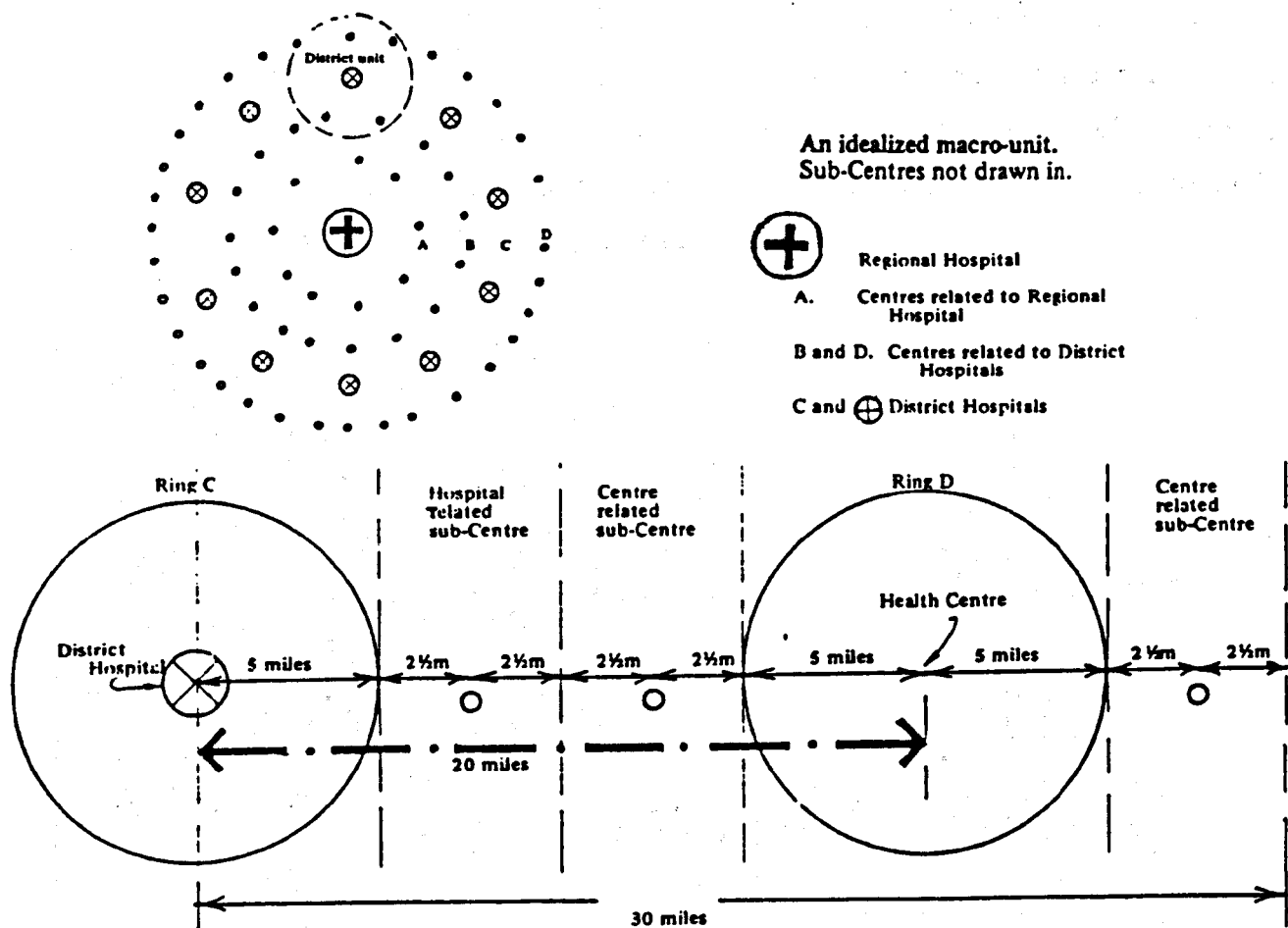


Figure 2.4 Distribution model, Source: (22)

The macro-unit, as suggested in the study, consists of one Regional Hospital relating to ten District Hospitals, each District Hospital relating to ten main centres and a number of sub centres.

The report has also suggested guidance on setting a centre into the country side and the use of the macro-unit to establish an overall outline plan. But the restriction which follows is that the-

"macro-unit works as an idea down to an average density of 77 people to a square mile, and can therefore be used overall as a calculator, but the average results must be readjusted area by area to the facts of geography and population, people and money." (22, p.44xv.)

They suggested drawing a series of macro-units on transparent material and a map of the

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country to the same scale as the units. The units can then be laid over the map without allowing more than 30% of wastage for overlapping and thus find out the number and distribution of hospitals and health centres. The process should also take care of geography, communication network, density of population etc. (see fig.2.5 and 2.6) The approach is complicated and can not be applied easily as a model.

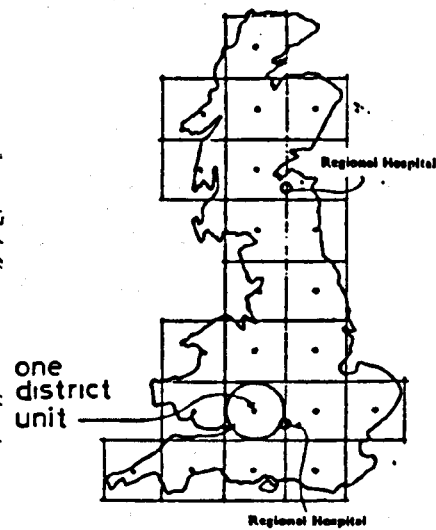
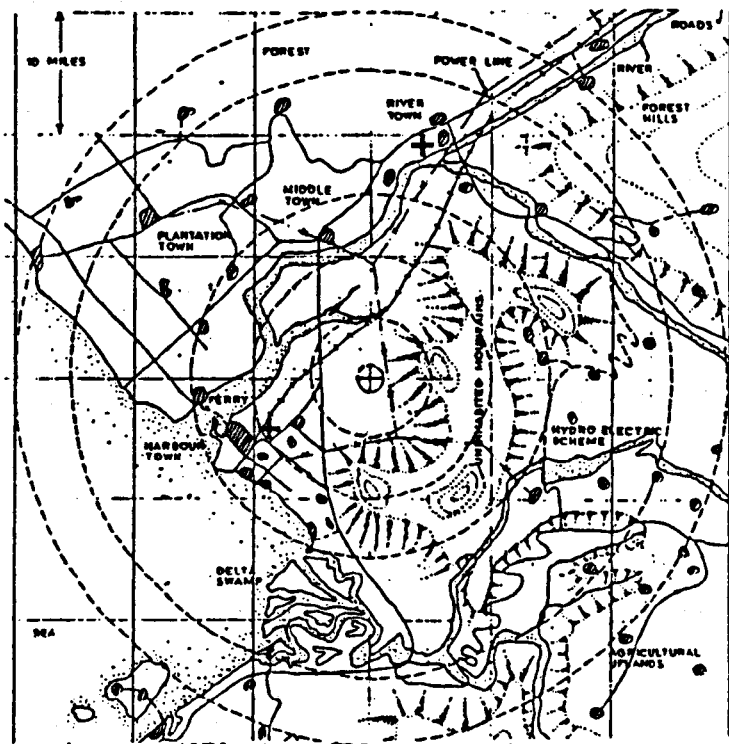


Figure 2.5 District units drawn to scale **Figure 2.6 A map of England and Scotland**
on transparent material round on a map. **satisfied with 22 district units.**

Some check lists are also offered for people with restricted building experience and limited access to professional advice. For example selection of site, step by step working procedure from site selection to implementation including how to conduct meetings etc. They stressed the need for community co-operation in order to reduce cost and enhance meaningful health care delivery.

The report ended with the appendix covering building orientation, construction and

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environmental considerations and description of a small rural health centre for 5000 people.

As the model and supporting guidelines are generalised for all developing countries, it must be adapted to meet local needs. As it is based on a specific model, not flexible enough for varied application. It is mostly descriptive and needed better link between policies and design solution suggested. It has not offered any room data. It has also offered valuable guidelines to calculate present workload and future projections.

2.3.3 MUKERJI, K. Primary Health Care Facilities In Developing Countries.

Report on a Research Project, Report 6. (91)

The aim of the research project was to study the Health and Social Welfare group of social infrastructure and to 'produce a monograph on Primary Health Care facilities for developing countries' (91, p.2). Preliminary research had been undertaken to determine content and range of the study and empirical investigations had been undertaken to ensure practical applicability.

Research Methodology:

Over-view of the variety of designs, functions and problems of primary health care facilities in developing countries had been obtained from examples actually surveyed and from published materials. The lessons learnt from the above study together with standard information from numerous other sources formed the basis of the recommended design guidelines and standards. The report had been addressed to -

"all health planners, architects, aid organisations, financing bodies, educational institutions, suppliers of medical hardware and medical personnel, involved in the planning, designing, financing, equipping, organising and staffing of PHC facilities 'and also intended for new comers as well as for the experts.' (91, p.3)

The study also stressed that the application should be according to individual country's available resources and standards. The following factors were considered as important:

- economy with respect to space, construction, equipment, staffing and maintenance.
- efficiency
- safety measures
- an acceptable working atmosphere

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- social appropriateness
- design in agreement with local custom, aesthetic and values.

The situation in developing countries has been overviewed as a first attempt to outline the parameters of the study. Secondly some Regional case studies of primary health care facilities were undertaken. Prior to that different levels of PHC facilities had been categorised into three groups. (see Fig. 2.7)

Category of Health Facility	Functions
<p>Buildings Limited number of rooms, average total of less than 100 m², exceptions up to about 150 m².</p> <p>Personnel One or more paramedics from the village or urban district (elementary school education plus short basic medical training), as well as several traditional midwives (with basic training and periodic refresher courses). Occasional visit by a doctor.</p> <p>Equipment Simple furniture, basic medical utensils (in exceptional cases, electrically operated equipment), simple tools for maintenance of the technical equipment, limited medicinal stores, not always connected to mains supply and drainage system.</p> <p>Transportation Bicycle, ox-cart, and horse drawn wagons, boat, public transportation.</p>	<ul style="list-style-type: none">- Mother and child care (delivery by traditional midwife, consultation and aid services for nutrition and immunization).- Improvement of environmental hygiene (guarantee of adequate drinking water supplies, drainage and waste removal, control of foodstuffs, pest control).- Health education (for personal hygiene, nutrition, family planning).- Preventive medical treatment (examinations and treatment of minor illnesses, routine examinations, first aid, supplies of only 10- to 15 medicines, referral of complicated cases).- Routine inoculations.

Figure: 2.7 Description and Functions of PHC facilities, Source: (91).

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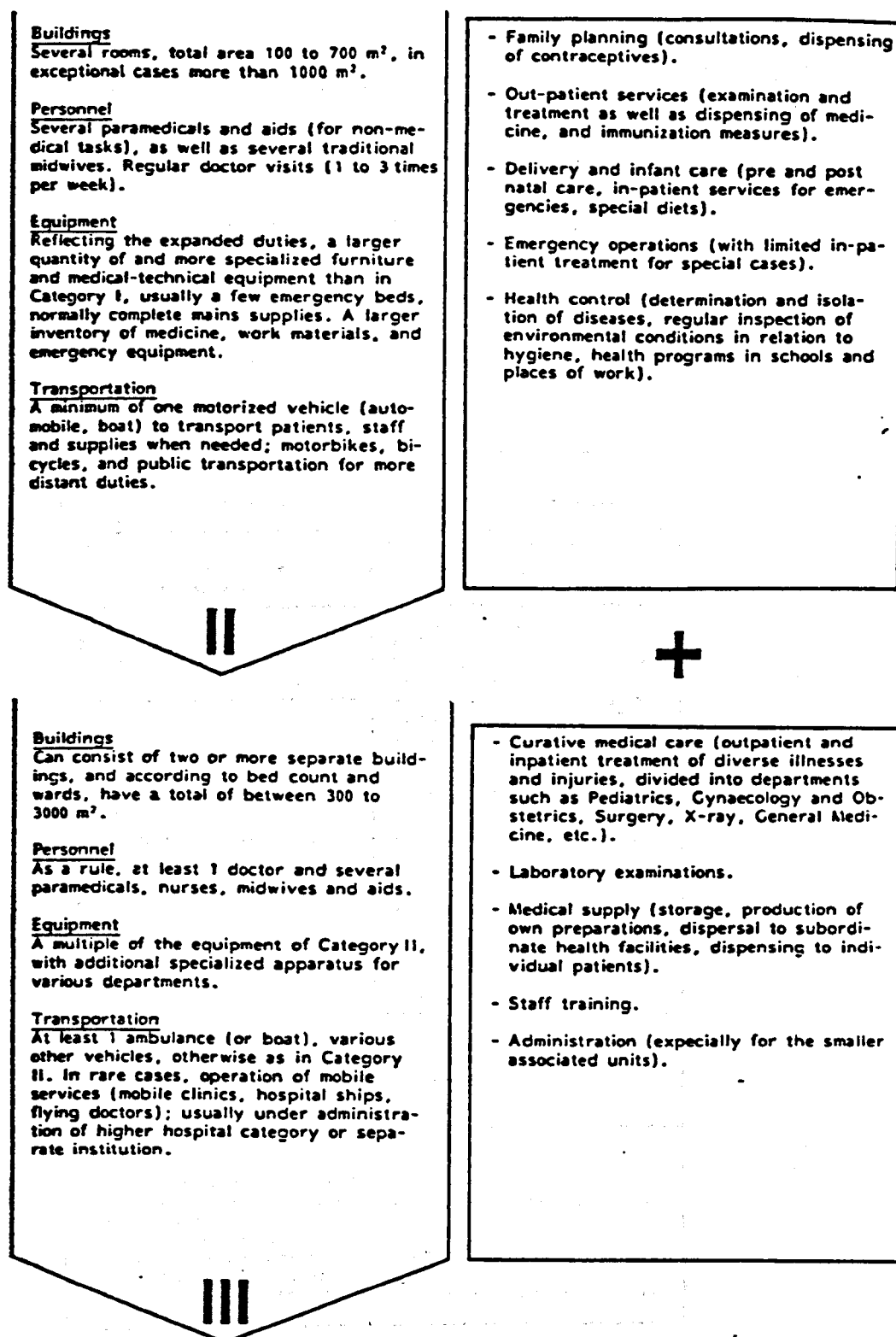


Figure: 2.7 Description and Functions of PHC facilities, Source: (91).

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The structure and contents covered for each region/ country and individual facility is outlined below:

Description of the countries:

- Form of Government: i. Type, ii. division, iii. language
- Population i. number, ii. density, iii. population growth rate. iv. religion
- Geographical Features
- Economy
- Social Welfare and Health Care

Individual country's information: (see Fig. 2.8)

Example No. 3		Country Indonesia	Place/Region Kota Bangun /East Kalimantan	
Cat.No. II	Facility Health Centre (Puskesmas)		Source/Date of Investigation November 1979	
Catchment Area 20 - 30 km radius 17,000 inhabitants Sub-district Kota Bangun			Area of Facility	
			OPD 19 m ² MCH, FP 13 m ² Waiting area 13 m ² Administration 35 m ² Store 5 m ² Total usable area 85 m ²	
Users 30 - 40 per day				
Scope of Services Prevention and treatment of general diseases MCH FP First aid			Staff 1 Doctor (general practitioner) 2 Nurses 1 Health worker 1 Midwife 2 Assistant nurses	
			Technical Infrastructure Electrical mains supply Rainwater tank	
Remarks One nurse is mainly responsible for the laboratory. The doctor is direct from the University, therefore with little practical experience. Reached by foot or boat. Complicated cases are referred to the Regional Hospital Tenggaron (60 km) by boat. Treatment against payment of a small sum - hardship cases free.				

Figure 2.8: Individual Country's Information Sheet, Source: (91)

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The fourth chapter is important in the sense that it is intended to serve as a manual for the design of facilities for basic health care in developing countries. It deals with "organisational principles of health care systems and facilities as well as design criteria for individual departments." (91, p.113) But due to different regional variation (i.e. climate, population characteristic, socio-cultural background and health situation), these standards and design guidelines can not be applied universally. But as the information is based on research from both literature search and a field survey, it has been claimed that "a sufficient practical data can be derived from it to enable the designer to create functionally and technically appropriate health care facilities for the given situation." (91, p.113)

In the study a check list of Planning Criteria of Health System has been suggested which influences type, size and location of a health care unit.

- (1) Population of Catchment area: structure, density and distribution, income and literacy level, cultural and ethnological background
- (2) Health Statistics: disease pattern, birth and death rates, hygienic conditions, availability of health personnel, patient frequencies/ inhabitants.
- (3) Climatic and Environmental Features
- (4) Existing Infrastructure: density of health service network, availability and condition of transport facilities, energy supplies, provision of water and waste disposal facilities.
- (5) Prerequisite for implementation: immediate and long-term plans, financial means, administrative structure, past experience, building codes, available technology, e.g. manpower, materials.
- (6) Type of facility depends on: local disease patterns, nature of existing health services,
- (7) Location: distribution and density of population, geographical features, by-pass phenomena
- (8) Physical features: Climatic and environmental factors, Technical and administrative framework, Consideration for future expansion, Financial constraints
- (9) Size: Financial, Population figures, expected patient frequencies.

Based on four different studies (91) it has established a method for calculating size of individual departments (i.e. consultation/ examination rooms, number of beds, obstetric department, surgical department), staff requirements and workload.

"Due to unreliable statistics, calculations of demand rely on empirical data obtained through local surveys of comparable situations, personal experience, assumptions and guess work." (91, p.117)

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The author suggested that the empirical studies should determine:

- travel time and distances covered by the majority of patients.
- densities and catchment areas.
- average consultation and treatment time for first attendances and subsequent visits.
- percentages of new and return patients.
- average number of visits per inhabitant per year.
- number of working hours per day and number of working days of doctor and medical auxiliary per year.

But it has also been mentioned that "such calculations can only make sense, if reliable statistical data of similar health facilities within the region is available." (91, p.124)

Organisational Principles of grouping and interrelationships of the various functional areas and departments of health care facilities shows how the three categories defined (see Fig 2.9) are structured. The use of schematic diagram is an attempt to form a basic framework into which the various levels of PHC can be fitted and is also expected to serve as a check list from which a design concept can be developed. It also suggests the use of Patient Flow Model as an important design aid on dimensioning and arranging the respective service areas.

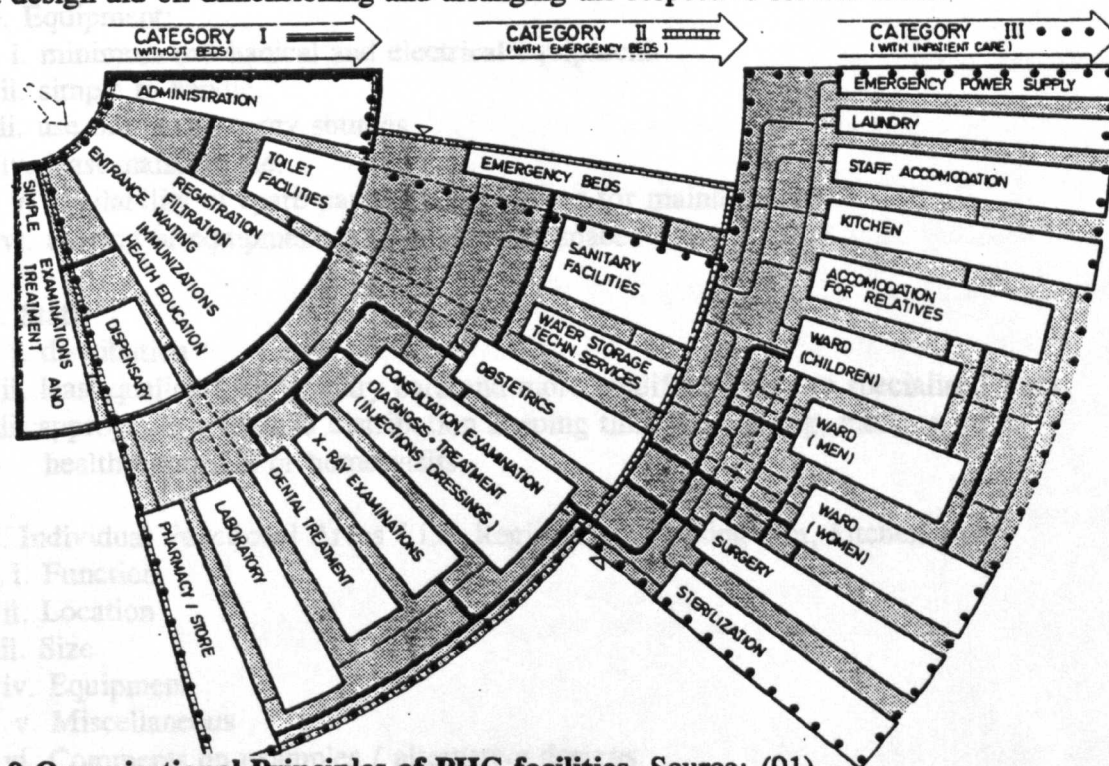


Figure 2.9 Organisational Principles of PHC facilities, Source: (91)

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Design Criteria for various service areas include departmental functions, location, space requirements and equipment sufficient enough for appropriate and functional designs. Other than these the following areas are covered:

- A. Building Site and Layout: new or old site, expansion possibilities, low building.
- B. Dimensions: 12M (M=10cm/ 4 inch) grid is used as a basic module for most building elements and equipment, both horizontally and vertically for the entire building. Several thumb rule dimensions are also used.
- C. Building Strategy:
 - i. climatic appropriateness of material and construction.
 - ii. safety measures against natural hazards.
 - iii. use of locally available, inexpensive materials, labour and energy sources.
 - iv. appropriateness of design for expansion and changes of internal layout.
 - v. minimisation of maintenance requirements.
 - vi. preferred conventional building material as prefabrication is more expensive.
 - vii. self-sufficiency.
- D. Equipment:
 - i. minimum mechanical and electrical equipment.
 - ii. simple to handle.
 - iii. use of cheap energy sources.
 - iv. least maintenance.
 - v. availability of spare parts and manpower for maintenance.
 - vi. sharing of equipment to save cost and space.
- E. Staff:
 - i. distribution
 - ii. least qualified for primary care and more qualified for more specialised work.
 - iii. appropriate workload distribution keeping time for training, meeting other health personnel or home visits.
- F. Individual Functional Areas (i.e. Registration, nursing unit, kitchen etc.)
 - i. Function
 - ii. Location
 - iii. Size
 - iv. Equipment
 - v. Miscellaneous
 - vi. Comments on examples / alternative designs.

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This is particularly directed for PHC facilities in developing countries. The most important part is the design guidelines section. This is useful as all information on function, staff, furniture and equipment, possible arrangement and size are given which is important for architects to know about individual spaces. As it is generalised for developing countries, it is also useful for Bangladesh, especially the design guidelines and method of research. The space standard, equipment and furniture, staffing will vary according to resource available. The levels of units from outdoor clinic to category II with inpatient care has resemblance to Bangladesh. Also it is not specific about overall organisation of spaces or units. It may be concluded that regarding size of the facilities flexibility should be there to add or subtract depending on the resources available.

2.3.4 DESIGN EXAMPLES:

Introduction:

The purpose of this section is to review examples from different developing countries which are considered to attain sufficient achievement in planning and design of PHC facilities, as cited in different publications (22, 62, 84). After the review and analysis of planning and design guidelines and methods, a review of design examples is felt to be important as lessons can be learnt from their experience and achievements to develop guidance for Bangladesh.

The design examples selected fall under the PHC group, mostly mentioned in earlier discussions. These are the 'Model Health Centres', examples illustrated in the WHO studies (e.g. Sudan, Columbia) and Kenya. The following guidelines/criterion are set for reviewing the examples:

1. PHC facilities: (services, catchment population, design concepts, functional areas).
2. Functional adequacy with respect to intended functions and space provided.
3. Design concept for example flexibility for future growth and change.
4. Environmental considerations, construction techniques and so on.

1. Model Health Centre:

In this case an attempt has been made to standardise buildings and methods while

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planning for the provision of health care in developing countries. The working party (22) assumed that for limited resources (staff, money), a country may be compelled to build a small clinic which may expand by stages into a health centre and subsequently to a district hospital with the availability of resources, population growth and improved communication.

A specific layout is proposed where any arrangement, rearrangement, omissions and additions can be made depending on local conditions. It also gives particular emphasis to rural culture and social habits of many tropical countries in the developing world.

In the model health centre the social area, kitchen and hostels are placed between the village and the centre to embed the centre within the community.

The following assumptions are made:

1. Only a part of the Model may be appropriate for a small Centre.
2. More accommodation than shown may be required in large Centres. Some Centres even turn into hospitals and this expansion has been planned for.
3. The buildings are laid out assuming that there is a best orientation for climatic reasons so they are set parallel to each other in the Model.
4. The buildings are designed so that they can be built with unsophisticated means and simple materials. The distance between walls and columns has therefore been kept as small as is practical. Where a bigger room is wanted or extra space is needed the roof is pulled out a little. This gives a complicated outline." (22, p.6) (see Fig. 2.10)

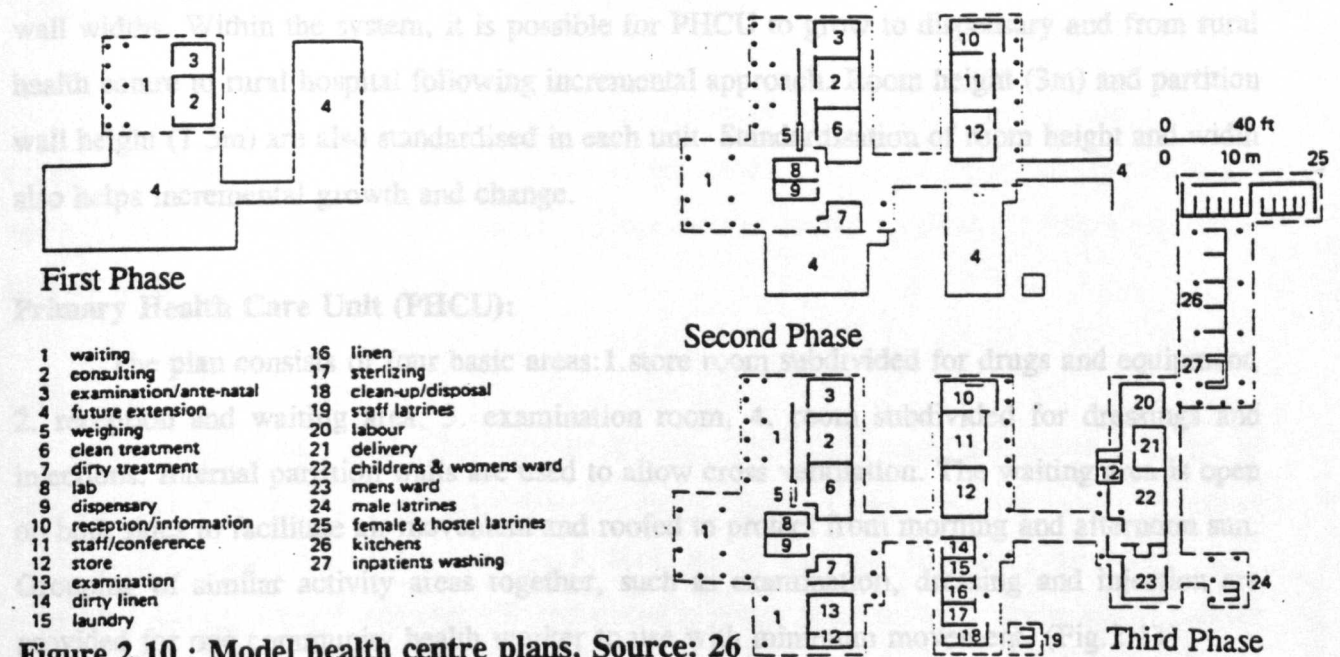


Figure 2.10 : Model health centre plans, Source: 26

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"The example shows(top) an under five's general clinic. It is enlarged (centre) into a bigger clinic with ancillary rooms and more space for staff and storage. It is further extended(bottom) to provide maternity facilities and a few beds for men. Later extensions might enlarge it by increments of 25 beds into a 125 bed District Hospital. There is provision for hostels or dormitories for cooking and laundry. The plans assume that there is unlikely to be water borne sewage.(Architect:Mark Wells)" (25, p.29)

Here stores and garages are placed in the front of the building to prevent pilferage. There are however fairly precise relationships which allow for growth and change.

2. Sudan:

The health services are delivered through Primary Health Care Units(PHCU), Dispensaries, Health Centres, Rural/ District hospitals and Provincial hospitals. A PHC Complex consists of a dispensary with a MA in charge and five PHCUs covers a population of approximately 4000 people. The MA organises and supervises the dispensary and five PHCUs.

The health project unit in the Ministry of Public Works produces type plans and project designs. These projects are then contracted out to private building enterprises and supervised by Health Projects Unit.

Design is prepared on a modular system for each of the functional areas which can grow and change when need arises. The plans are based on multiple grid of 30 cm internally between wall widths. Within the system, it is possible for PHCU to grow to dispensary and from rural health centre to rural hospital following incremental approach. Room height (3m) and partition wall height (1.5m) are also standardised in each unit. Standardisation of room height and width also helps incremental growth and change.

Primary Health Care Unit (PHCU):

The plan consists of four basic areas:1.store room subdivided for drugs and equipment, 2. reception and waiting area, 3. examination room, 4. room subdivided for dressings and injections. Internal partition walls are used to allow cross ventilation. The waiting area is open on both sides to facilitate air movement and roofed to protect from morning and afternoon sun. Grouping of similar activity areas together, such as examination, dressing and injection are provided for one community health worker to use with minimum movement. (Fig.2.11)

Primary Health Care Facilities in Bangladesh

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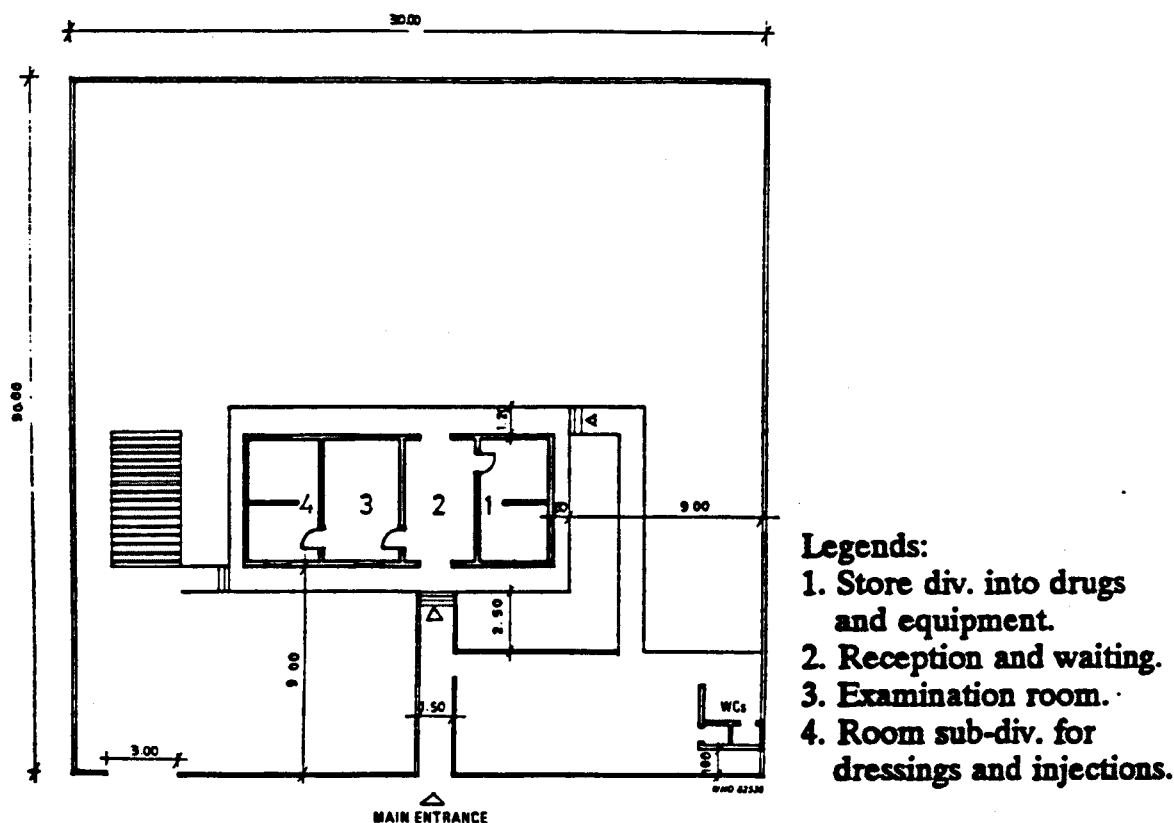


Figure 2.11: Type plan of PHCU- Sudan, Source: (6)

A shed is provided for the use of guard cum cleaner and waiting relatives adjacent to the centre. Two toilets with flush, aqua- privy or pit latrines, as appropriate, are provided for males(1) and for females(1). The site size (30mx30m) is chosen to allow its future expansion into a dispensary.

Dispensary:

The plan consists of the following basic areas (Fig.2.12), contained in two units linked by a covered walk-way. 1. ante natal clinic, 2. reception and waiting, 3. examination, 4. room subdivided into drug store room for MA, 5. room subdivided into laboratory and store room, 6. general waiting area, 7. room subdivided into dispensary and waiting 8. room subdivided for

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injection and dressings.

Room 3 and 4 as well as 7 and 8 are grouped together for easy use by MA and nurse respectively. It is not expected that the dispensary will be developed into a health centre.

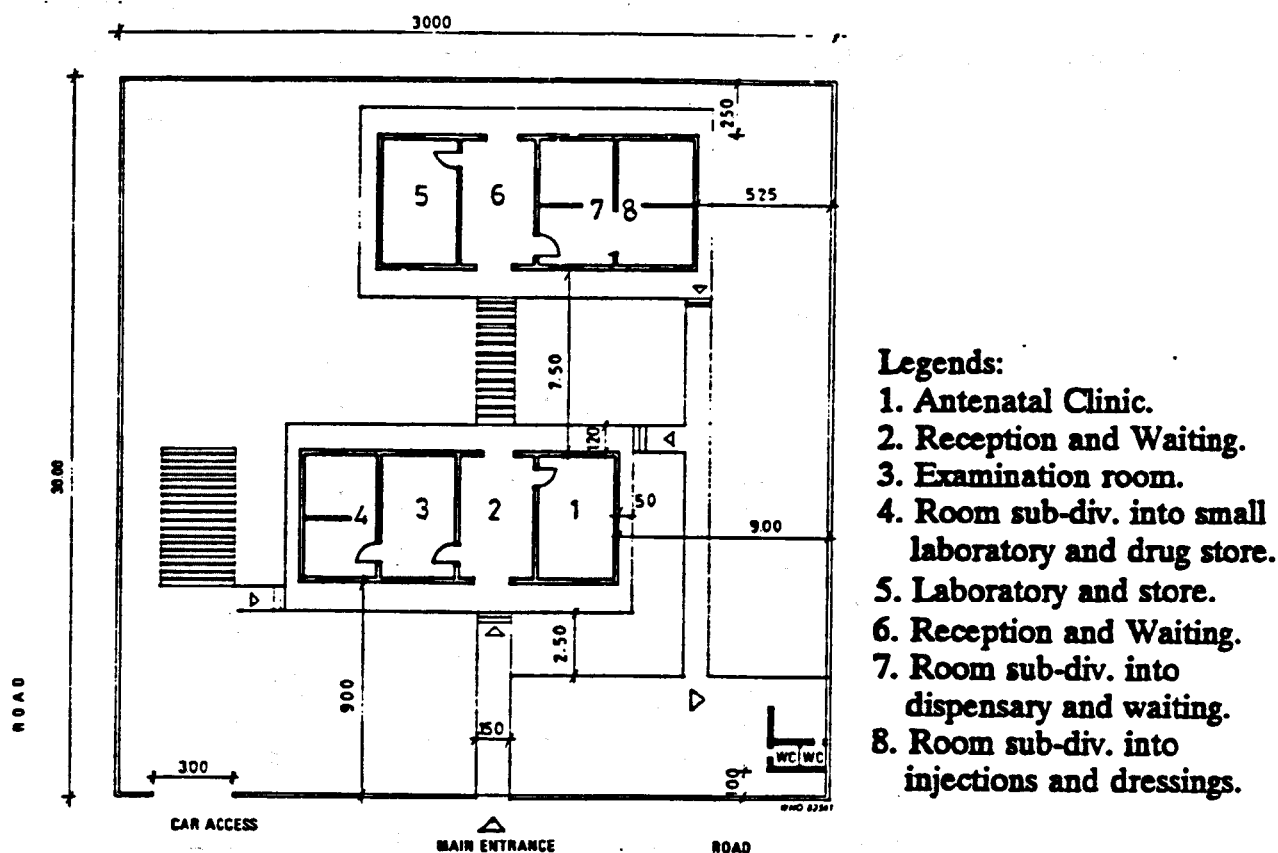


Figure 2.12 Type plan of dispensary, Source: (6)

Rural Health centre and hospital:

Based on type plans (1974), the rural health centre can be developed into a rural hospital by phased construction. It is staffed by one MA and supporting staff serving 50 000 population. The design is based on two considerations:

1. that the centre could be developed by stages and would offer a full range of out-patient care when fully developed;
2. that the centre could easily function as an out-patient department, when developed to

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3. Model a rural hospital.

The plan is divided into four blocks as shown in fig.2.13 The single story blocks are constructed in load-bearing walls with pitched roof. Here the 1 m grid is used internally between wall widths with room depth fixed at 5m clear.

They also attempt to develop type plans for parts of facilities e.g. wards, operating theatre and so on.

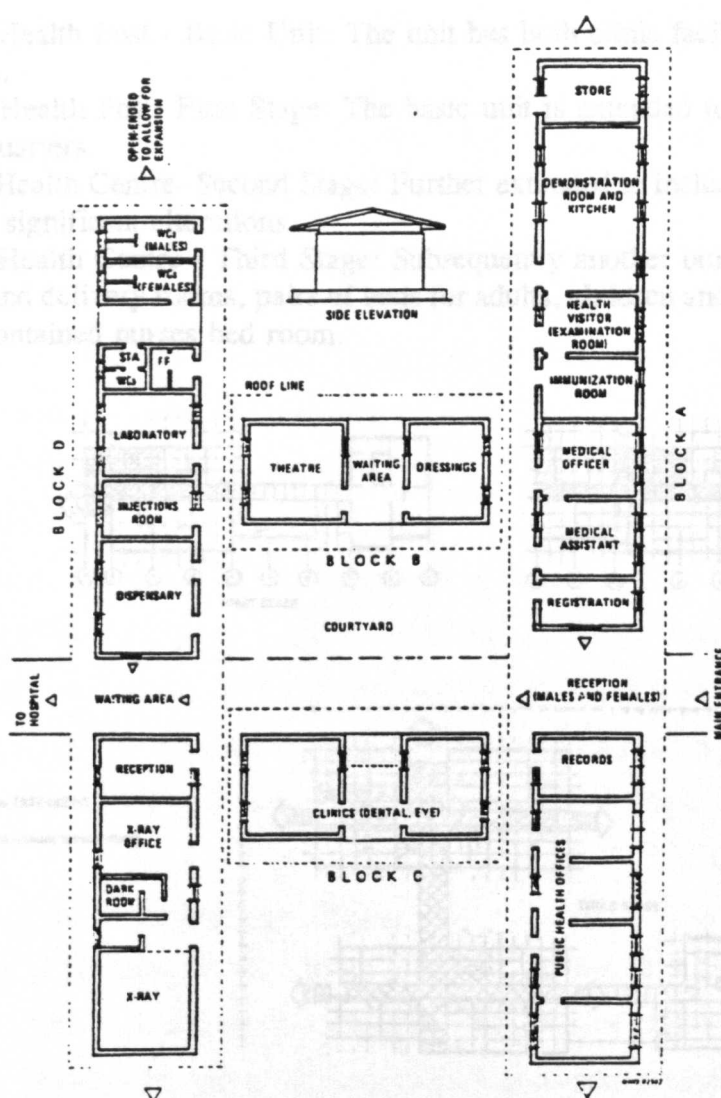


Figure 2.13 Type plan of Rural Health Centre -Sudan, Source:(6)

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3. Model Design Approach in Columbia:

Here flexible planning and design of health facilities are proposed by phased construction, standardised architecture and equipment. The process enhances easy development of a health post to health center which can even grow to a small sized hospital with the availability of resources and in response to local needs. The following figures shows those designs carried out in Columbia by the National Hospital Fund.

- Fig.2.14: Model Health Post - Basic Unit: The unit has both clinic facilities and staff living quarters.
- Fig.2.15: Model Health Post- First Stage: The basic unit is extended to include separate staff living quarters.
- Fig.2.16: Model Health Centre- Second Stage: Further extended to include dentistry and offices without significant alterations.
- Fig.2.17: Model Health Centre - Third Stage: Subsequently another building is added with labour and delivery rooms, pairs of beds for adults, children and obstetric patients, and a self contained nurses bed room.

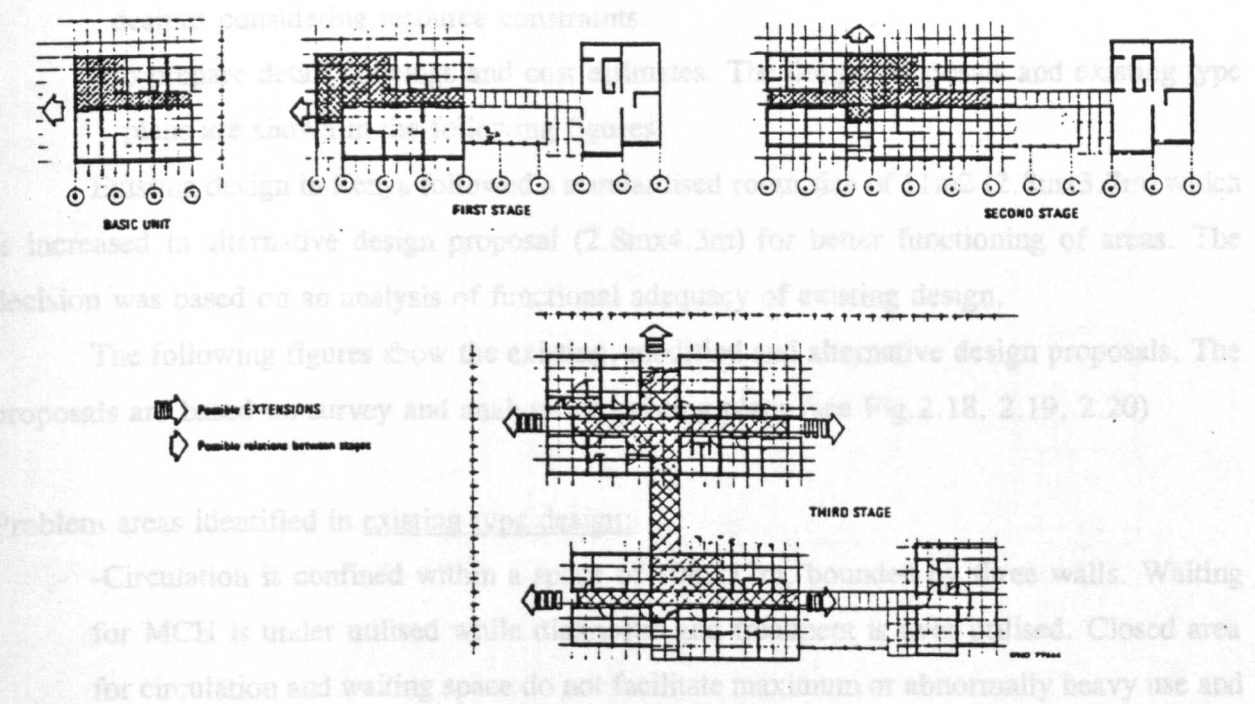


Figure 2.14 to 2.17: Model health posts and health centres, Source: (76)

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4. Kenya:

The Rural Health Service Programme is developed on a framework of "Health Units" and "Health teams" and the concept of "Family Health". A health unit serves a population of 50,000. Each health unit comprises of a number of health clinics and dispensaries. When the number of dispensaries in a area reaches four, the health unit is provided with a "sub-centre". Under the Health Team concept, rural health personnel work as integrated team under the supervision of the senior health officer in the district. Personnel are organised as local teams under the technical and administrative leadership of the senior medical assistant in the Health Unit.

The Danish International Development Agency (DANIDA) had been appointed by Kenyan Government in 1981 for the following works:

- review of existing type designs by White Arkitekter (93) and identify areas of short comings.
- to propose possible modifications for improving existing type designs and/ alternative designs considering resource constraints.
- to prepare detail drawings and cost estimates. The design proposals and existing type plans are shown in the following figures.

Existing design in Kenya followed a standardised room size of 11m² (2.8mx3.7m) which is increased in alternative design proposal (2.8mx4.3m) for better functioning of areas. The decision was based on an analysis of functional adequacy of existing design.

The following figures show the existing, modified and alternative design proposals. The proposals are based on survey and analysis of existing plans.(see Fig.2.18, 2.19, 2.20)

Problem areas identified in existing type design:

- Circulation is confined within a space of 10mx17m, bounded by three walls. Waiting for MCH is under utilised while diagnostic and treatment is over utilised. Closed area for circulation and waiting space do not facilitate maximum or abnormally heavy use and lack future expansion possibilities. Due to inappropriate location of MCH, diagnostic,

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treatment and in-patient areas, cross circulation of patient and staff causes congestion and overcrowding of certain areas (i.e. movement of staff between MCH and inpatient area and between registration and diagnostic and treatment.)

- Waiting area lacks natural light, ventilation and has acoustic problem and from gable end it is exposed to rain water.

- There is a lack of privacy for male and female patients.

- Adaptability to different site conditions(i.e. sloping sites) is problematic due to combination of MCH, OPD and IPD.

- Room size (11m²) is tight for furniture placement and for comfortable working space

- Not suitable under conditions of limited staff. (see Fig. 2.18)

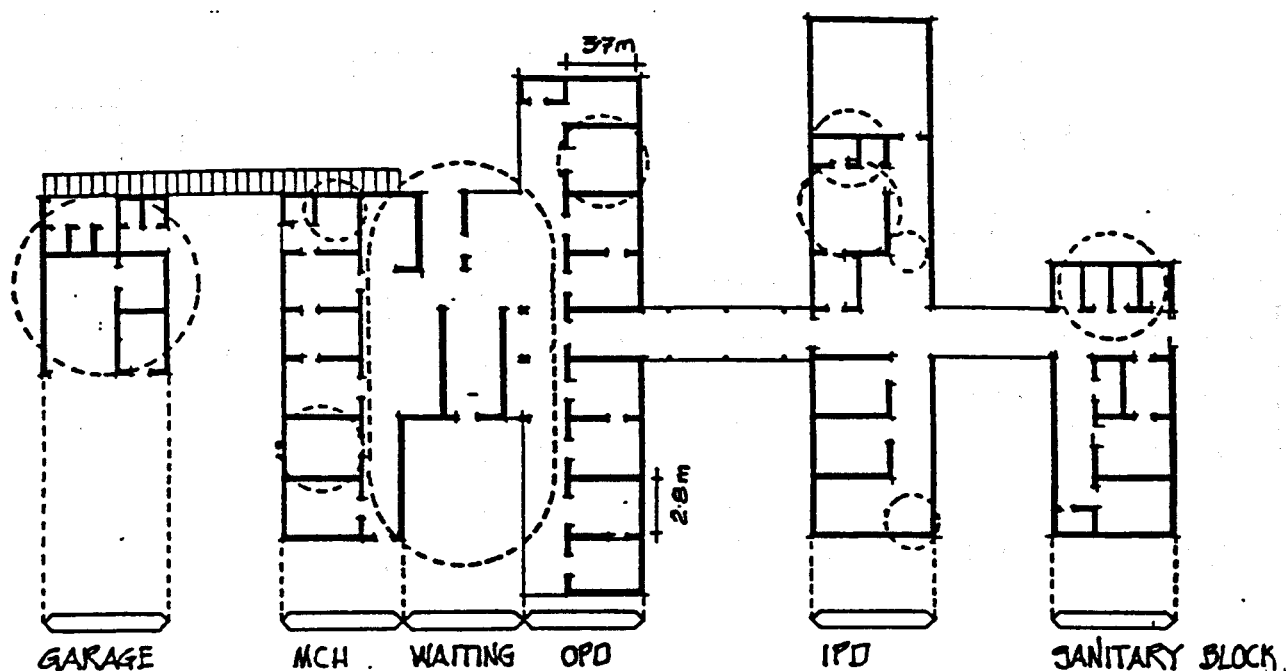


Figure 2.18: Existing Type Design - Kenya

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Modified design:

- Waiting and circulation is separated for MCH and OP.
- Semi-open waiting area provides scope for natural light and ventilation, less acoustic problem and scope for future expansion.
- Separate waiting for MCH, OPD and Diagnosis and Treatment to facilitate privacy.
- Building MCH, OP, IP in separate units gives scope for site adaptability. (see Fig.2.19)

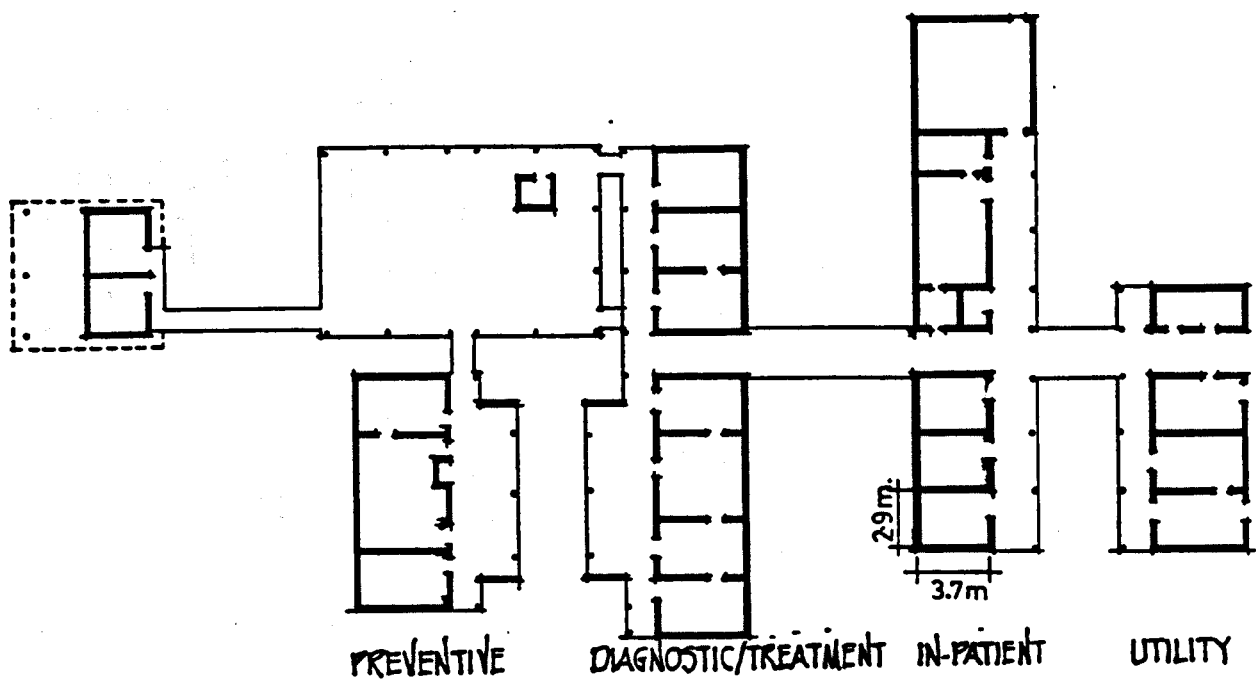


Figure 2.19: Modified type design - Kenya, Source: (93)

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Alternative design:

- No cross circulation between arriving and departing patients.
- separation of male and female patients.
- Registration and waiting area is in a detached structure.
- Increase of room size to 2.8mx4.3m to allow for accommodation of standard furniture and provide space for inter connecting doors.
- Several rooms are added according to functional need. (see Fig.2.20)

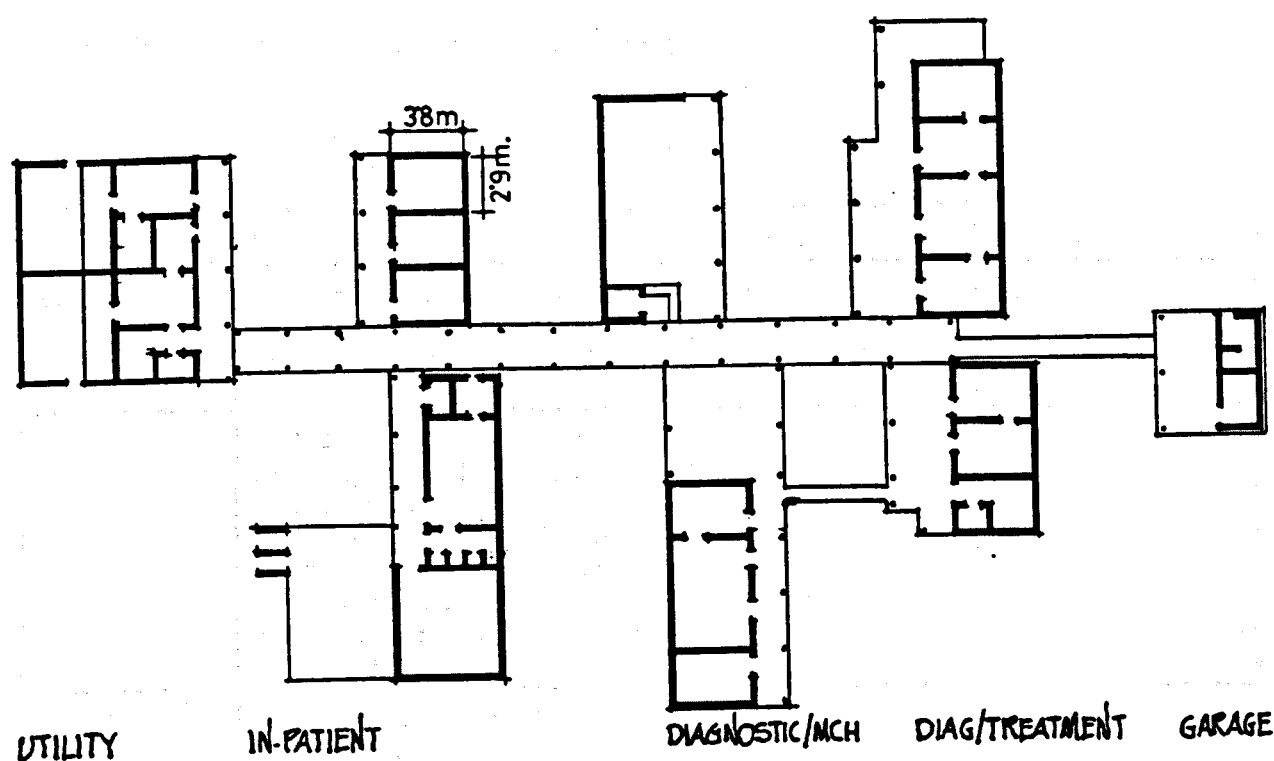


Figure
2.20 Alternative type design - Kenya

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Environmental consideration:

Single bay structure with windows on both sides has been designed in most of the type plans to facilitate natural light and cross ventilation. In Sudan partition wall of 1.5m high (half of the room height) is used within one bay for the same purpose.

Construction techniques:

In all the countries under study use of local material and building technology has been given priority. This is considered important to reduce building cost, use of available manpower, future maintenance and to match with vernacular architecture.

The following table 2-1 and figures (2.21, 2.22, 2.23) show building material and construction details and typical section of each type plan.

	Roof	Foundation	Window
Sudan	Timber or steel trusses fixed to top string course beam. (same detail for PHCU, Dispensary, RHC)	Vary depending on ground condition.	Glass
Kenya	G.C.I. sheeting for roof. Partition wall: 90 mm. Permanent structure: OPD, IPD, sections of utility unit. Improvable structure: auxiliary units (circulation, waiting and garage.)		
Model Health Centre	Zinc, iron, aluminium or asbestos sheet at about 15 pitch; tiles at 30-35 pitch; thatch either on its own or laid over metal sheeting.	Column if of wood mounted on stone or concrete blocks.	

Table 2-1: Building material and construction details

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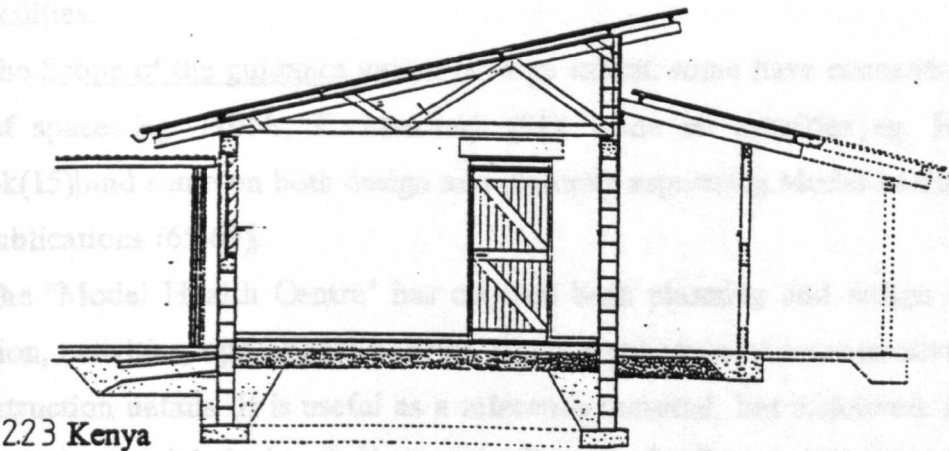
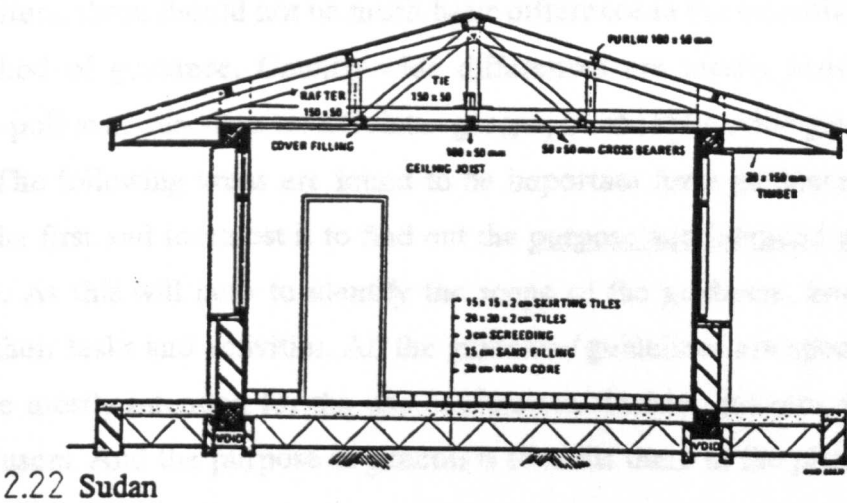
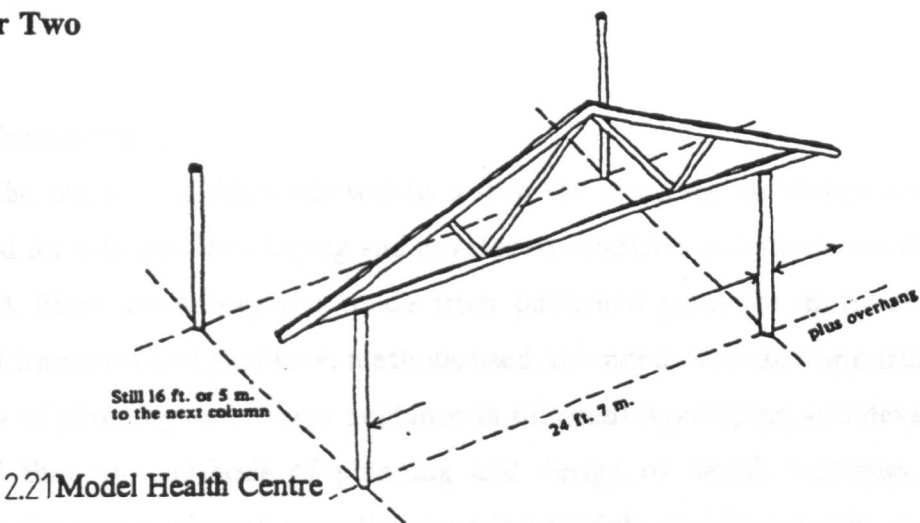


Figure 2.21: Typical section of type plans, Model health centre, Sudan , Kenya

-2.23

Source: (6, 22, 93).

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2.4 Commentary:

The purpose of this study was to review the planning and design methods used and suggested for different developing and developed countries in order to develop a theoretical model. A literature survey was made from published guidance material on aspects like essential framework of guidance, methods used, intended users and important contents. The overview of planning and design guidance in different developing and developed countries revealed that the methods of planning and design of health buildings, their essential contents, the stages of work were the same in principle. Fundamentally, as agreed by most of the writers, there should not be much basic difference in the essential framework, content and method of guidance. Country-wide differences are mostly brought about by socio-cultural, political, resource constraints, geographical, epidemiological and demographic factors. The following areas are found to be important for a guidance.

The first and foremost is to find out the purpose and intended users of the proposed guidance. As this will help to identify the scope of the guidance, how the guidelines will support their tasks and activities. All the guidance/ guidelines are specific about their users which are mostly intended for the use of planners, decision makers, architects and health building users. And the purpose in general is to assist them in the planning, design and use of the facilities.

The Scope of the guidance varied in large extent, some have concentrated more on design of spaces [eg. HBNs, K. Mukherji (91)], some on activities [eg. Health centre handbook(15)] and some on both design and planning aspects [eg. Model health centre (22), WHO publications (65-69)].

The "Model Health Centre" has covered both planning and design aspects, from distribution, activities, operational policies, staffing, schedule of accommodation to design and construction details. It is useful as a reference material, but disjointed. As it is based on a particular model design, it does not offer any flexible and systematic method of planning and designing a PHC facility for wider application. It needed a better link between

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policies and design solution suggested. Similarly the WHO publications covered all ranges of facilities, stages and combined different experiences of architects, planners, equipment designers and so on. It is also useful as a reference, but difficult to synthesize and use as a guidance.

The advantage of HBN46 (35) is that the whole building is dealt in one guidance, which is handy and concise. Options are given for different organisational principles and sizes of facilities. But mostly these are presented as detail description of individual spaces. It is also difficult to use directly from the note to prepare a brief and design a premise without the support of other guidance e.g. DBS, ADB.

For Bangladesh due to the lack of other supporting materials, the guidance should be all inclusive and as complete as possible for better use. Moreover all PHC facilities, being small scaled projects, should be dealt in one guidance in order to link individual facilities. So if a smaller unit is designed or planned at first stage it can grow to upper levels and shrinks as necessary.

The guidelines given by K.Mukherji (91) is generalised for developing countries and it is left open for individual countries to determine size, level of services, staff and design solution and as such no model plan is proposed. Also it is not specific about overall organisation of spaces or units.

Certain checks on the quality of services can be made if it is specified what are the main requirements for a project to get approval as set in the HBO, stages through which a project will pass, cost and area relationship.

The planning and design guidance available in the U.K. are vast requiring a large organisation for continuous updating and producing guidance. The MARU study on the use of guidance shows that project teams rarely use all the guidance materials available and demanded more updating of guidance and to clarify the status of guidance. They have also developed computerised system of activity data bank which is expensive to run and requires skilled manpower when compared to Bangladesh. Also for resource constraints and lack of skilled manpower, the maintenance and updating of the guidance by a centrally organised

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team should be preferred.

Structure/ Framework of guidance is the next important phase to decide. It is necessary to determine the different stages of a project from inception to completion, stage related tasks and personnel involved. The majority of the guidance recognised the phases through which a project should pass like need identification, briefing, design, construction, commission and evaluation.

These phases are specially emphasized in HBPNs. It is a management system identifying the plan of work. These stages are important to identify at the outset of each project so that stage specific tasks can be identified, persons responsible for work and cross check can be made.

Even in the WHO publications these phases are highlighted from management point of view. In Bangladesh these stages are not clearly defined, mostly disjointed, one phase not depending or taking advantage of the other.

The advantage of DBS is the checklist system which offers opportunity to check decisions from options given in order to identify user's requirements. The ADB is useful for the design team as it provides list of all components, illustrates activity areas, functions and activities. Guidelines given by Justin Keen (56) have also the advantage of using the checklist of important information needed to be collected from the users group.

The strength of the "Health Centre Handbook"(15) lies in the systematic method of briefing and design from analysing activities and their sequences, determining space, criteria of each space, preparing activity data sheet, establishing room relationship and future needs. The use of activity charts, link diagrams and activity sheets presents a unique idea of involving different team members for commenting on and deciding the preferred accommodation. These are useful for designers as valuable sources of information. Architects will find it easier to get all information regarding one activity or space in one single sheet rather than detail description of all the spaces as in HBPNs and the "Model health centre".

The important thing which comes out from this analysis is that the guidance should

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be as precise as possible, easily readable and maintain a systematic approach. Detail description of spaces and less diagrammatical presentations in HBNs should be avoided from user's point of view. On the other hand checklist approach or some form of format which generate team work and enhance decision making process should be attempted.

After deciding the purpose, users, scope and structure of guidance, the next phase is to deal with the method of planning and design of the facilities systematically.

Among the stages, problem and need identification is the essential first step to determine. Assessment of need should be based on catchment area and population to be served. For a developing country like Bangladesh it is not possible to provide all services and facilities at one time. Thus it is necessary to set priorities and appraise alternative options to come to an economic solution. A clear formulation of overall strategic plan can avoid duplication of efforts and take account of existing resources i.e. buildings, manpower, money.

Type, size and number of units should be based on overall countrywide basis. The idea of bed numbers per thousand population to identify need has gradually shifted putting more emphasis on population coverage in the WHO studies and other research projects. Selection of location and building sites to enhance accessibility are highlighted in WHO papers. While in the "Model Health Centre" these are regarded as prime criteria for future growth and upgradation to a higher level of facility.

The HBNs also stressed the need identification stage, specially to establish the need for new premises, alteration or extension of existing premises. In HBNs space standards are rationalised based on evaluation and analysis of previous designs. Although evaluation and analysis of existing premises were stressed in HBN and "Model Health Centre", these are not described in the guidance which may be difficult to understand the basis of these proposals. Regarding existing workload and workload projection, no specific guidelines are given in HBN46 as it is assumed that the organisations will vary in size depending on resources available. The guidelines given by K. Mukherji (91) are also based on varied size and workload of facilities. It may be concluded that regarding the size of the

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facilities, flexibility should be there to add or subtract depending on the resources available. The "Model Health Centre" has also offered valuable guidelines to calculate present workload and future projections.

In Bangladesh for public health facilities a generalisation can be achieved due to the fact that these are managed, run and financed by the Government. Ownership is not as varied as expected in the HBN 46. Depending on the resource allocation certain idea can be developed regarding minimum size of these facilities and likely projections for future need to avoid duplication of work for similar facilities.

Selection of location of building sites are emphasized in WHO publications in order to enhance accessibility.

To state clearly the needs, services, staffing pattern, operational policies, activities and so on, a Brief is indispensable. It is a multi professional team work to transfer information from users to designers. A multi professional planning team consisting of users representatives (e.g. medical, nursing, community) and design team (architects, engineers, surveyors) are essential.

All the guidance under study stressed the need to prepare a brief before the design stage. For Bangladesh this phase is almost neglected. The architects have to assume a lot of design requirements during design stage, especially with respect to operational policies, activities and user's requirements. Designs are mostly based on existing models without due regard to changes in function or spaces. In "Health centre handbook" during briefing process stress is given more on activities, sequences and role relationships.

Detail brief may become out of date, so it is better to formulate a clear, broad and strategic framework for preparing the brief.

Operational policies are identified as an important aspect in many of the recent guidance and research projects. These are essential for functional and organisational aspect of design and evaluation of the health buildings.

All individual department notes (HBN) are more concerned with individual spaces, not as much on operational policies. Thus it is difficult to establish a relation between

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operation and design. But they suggested some alternatives to choose between to suit different operational policies. Moreover department wise guidance in HBNs made it difficult to combine "different parts together efficiently and economically into a whole hospital." (88) Whole building planning is necessary along with individual activity areas e.g. communication, traffic and supplies.

The PHC facilities in Bangladesh have the advantage of being small scale projects. Care should be taken to link different categories of PHC facilities. It should not only include whole health care unit describing communication, traffic and supply but also link between different levels of facilities.

Workload and their projections are essential to determine scale of the unit. Various methods have so far been developed to calculate the workload of staff depending on available and reliable data about activity levels and throughput. It is necessary to develop a logical method to anticipate future users, workload, services and resulting activity and space requirements.

Current activities and activity sequences can be obtained from existing buildings. These are vital to determine activity spaces, grouping of activities, to enhance multi use of spaces and finally to prepare schedule of accommodation. Users intended and anticipated activities, as identified by R. Cammock (17), can be grouped according to users. Movement of people, goods, things and ideas provides information on organisation of activity spaces.

Schedule of accommodation is another important component of guidance. But here it is essential to decide when and how to prepare the schedules. Because early preparation of accommodation schedules may hinder possibility for flexible design and shared use of spaces. This will ultimately make changes in design difficult.

Schedule of accommodation appears as a basic briefing documents in HBNs. Schedule of accommodation is necessary but not tight fit along with operational policies. Schedule of accommodation is not suggested in HBN 46, "Report 6" by K. Mukherji (91) mostly because of varied sizes and ownership of the facilities.

From activity analysis and ergonomic studies a range of Room Data Sheets can be

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developed with information on equipment, services, users and environment. But here it is important to decide at which level it will be standardised (activity space, individual room, group of related spaces, departmental or the whole unit). Here emphasis should be given on available resources, flexibility of space use, scope for future growth and change, available technology and material. But for bigger units it will become bulk to produce individual activity data and difficult to maintain and upgrade.

It is important to determine the essential design principles and ways of implementing them. Different design principles are identified for developing and developed countries. For the UK these are privacy and confidentiality, securing circulation and supervision, growth and change, efficient use of space while for developing countries as well as these economy, use of local technology and material, social appropriateness and so on are given importance. The design criteria for each space like privacy, security might be similar for Bangladesh but differ in degree and also might need other local considerations. For example due to religious and cultural reason male-female segregation in waiting area need to be provided. Again application of time tabling and appointment system might not work for poor communication system.

The following lessons can be learnt from the overview and analyses of the design examples chosen:

Phased construction of facilities is essential to cope with future changes. All these country's experiences show considerable change in the services and facilities demanding change in facility provision by upgrading existing facilities.

The design examples show different forms of growth and change and attempts to accommodate them in the built form. For example in Sudan partition walls offered scope for modification with changing needs. Use of modular dimension/ standard grid facilitate changes in the functional use of spaces. Again expansion by one complete unit from PHCU to Dispensary shows another way of growth. In Columbia growth and change took place in successive stages. During each stage changes in space use occurred replacing old activities by new activities. Such changes are made to keep efficient functional relationships, traffic

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movement and functioning of individual areas. Similarly model health centre and PHC facilities in Kenya showed growth and change in successive stages. In model health centre such stages are predetermined.

The study shows that in order to achieve maximum flexibility for future expansion and growth, efforts have to be given in the planning and design process. The shape and size of layout and design based on modular concept considering functional relationship and circulation pattern offers scope for adopting future changes. Among other important strategies the maximum use of natural light and ventilation, use of low cost technology, local construction technique, building material and the importance of functional suitability of spaces and required room relationship are stressed. The new building techniques of developed countries with skilled and experienced labour may not be suitable for Bangladesh with plenty of cheap but unskilled manpower.

Last of all, evaluation of existing facilities is essential in order to meet need and demand, correct next phases and determine future changes. Physical and functional evaluation of existing buildings are regarded as an essential step prior to preparing guidance in HBD of the DHSS. Study on space utilisation is another important aspect which reveals the important fact of shared use/ multi-use of spaces. Information on duration/frequency of activities, grouping of activities are also essential for design development. Without actual feedback from existing facilities, this is difficult to determine. Based on the overview and analysis of planning and design methods, the next stage is to develop a theoretical model of guidance.

CHAPTER THREE

THEORETICAL MODEL OF PLANNING AND DESIGN GUIDANCE FOR PHC FACILITIES

Chapter Three

THEORETICAL MODEL OF PLANNING AND DESIGN GUIDANCE FOR PHC FACILITIES:

3.0 Introduction:

The aim of this section is to develop a theoretical model of planning and design guidance. The objective is to propose a systematic and logical sequence/ method for the guidance of PHC facility projects in Bangladesh. A systematic approach is needed for briefing, design and building: to bring order and discipline to the development of units; to integrate above procedures in order to improve health building design, performance and adaptability; to save time and money throughout the whole process.

Here the structure and method of guidance will be emphasised rather than the content, as the purpose is to test the method from a real life situation and get feedback information to develop a final proposal. This will then be applied within the actual constraints of limited resources, local technology and future need for growth and change.

Overview and analysis of planning and design guidance in different developing and developed countries as discussed in chapter two is regarded as a useful basis for developing the theoretical model.

The following sections are being covered in chapter three:

- a. Scope of work
 - i. purpose/ aims and objectives of guidance
 - ii. intended users of guidance
 - iii. decision on the boundaries of guidance (i.e. what to be included/ excluded, main sections)
- b. Structure / Framework of guidance
 - i. overall framework of guidance
- c. Step by step method
 - i. aim and objective and scope of the task/ work
 - ii. any condition/ criteria of the work
 - iii. method of work.
- d. Any problem to be taken into account

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3.1 Scope of Work:

The aim of guidance should be to assist the users of the buildings (e.g. doctors, health auxiliaries, nurses, other staff) designers and decision makers in understanding the principles and procedures involved in the planning and design of PHC facilities. This is to help them in analysing the problem, formulating a solution and executing that solution through the various stages of the project from inception to completion.

The procedure for a health care facility project can be considered as consisting of the following stages:

Problem and need identification : "A problem can be defined as a negative existing state while a need can be seen as an existing priority to solve a problem." (112, p.3/2) These are essential to be determined for a health facility project. The stage should include strategic and service planning; feasibility study with respect to site, resources, management; functional and physical evaluation of existing situation; workload projection.

Brief: The brief or functional programme is a document identifying user's (e.g. doctors, nurses, patients, other staff and visitors) requirements, in terms of functions and purpose, to the designer.

Design and production: From project brief to develop the layout, design and method of construction for necessary approval. The production phase consists of producing all necessary drawings and documents essential for tendering by a contractor and to enter into a contract and start work on site.

Construction: The purpose is to complete the construction of the designed project within the agreed cost, time and quality target.

Commission: The purpose is to carry out all that is necessary in order to bring the facility into use. It should also provide operating and maintenance instructions with practical staff training and ensure proper functioning and maintenance of the finished health care facility.

Evaluation: This stage aims at systematic evaluation of the facility in use in order to provide feedback for the benefit of future projects.

The study will cover the first three phases in order to develop a method for planning and

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design of PHC facilities. The idea behind the model guide is to establish a theoretical framework for Planning and Design of PHC facilities in Bangladesh which will be verified later through evaluation and analysis of existing facilities.

3.2 Structure / Framework of Guidance:

Health care facility planning and design is a complex process and involves many individuals and activities. To bring an order and system to the whole process it is felt essential to have a clear structure/ framework for the guidance. The whole process can be identified as consisting of various activities performed through different interlocking steps. The following framework is developed as a structure for PHC facility planning and design guidance: (see Fig.3.1)

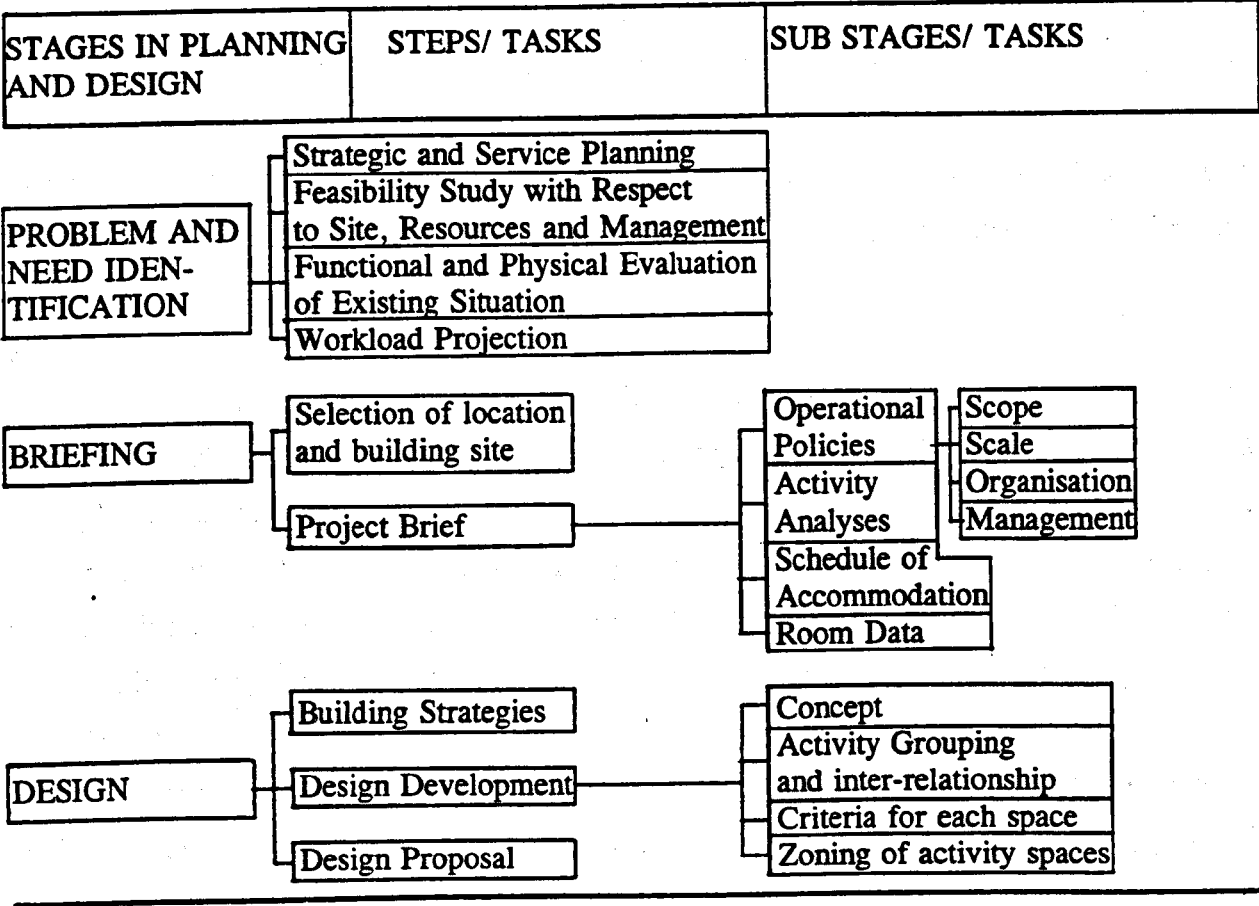


Figure: 3.1 Structure/ Framework of Guidance

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3.3 Step by Step Method:

The steps developed in Fig.3.1 based on the analyses made in chapter two are now discussed in a sequence from need identification to design. The purpose of each step, stage specific tasks and method of work are described under each step.

In Bangladesh the main stages that exists are like briefing in the form of accommodation schedule, design developed from practical experiences or repeating the type plans on different sites, tendering, construction and so on. The purpose of this study is to develop a systematic method so that right from the beginning the problems can be identified, logical methods can be established with the hope that it will result in an efficient planning and design of PHC facilities in Bangladesh. In Bangladesh it is more appropriate to systematise the whole process due to the lack of skilled manpower in the field and to help them to prepare their brief and design. So that time, money, manpower and physical facilities are not wasted throughout the whole process. Such guidelines and guidance based on field investigation will provide the planners and designers a common ground saving their time to start from scratch, the aid organisations and Government Departments (e.g. Health Ministry, Planning Commission) to plan, programme and set priorities.

3.3.1 Problem and Need Identification:

Planning is referred as " the process of deciding how the future should be better than the present, what changes are necessary to make these improvements and how the changes should be implemented." (126, p.30) It is the process of choosing between alternative courses of action so as to achieve the best possible result. For proposing alternative courses of action, problem and need identification from existing situation is the essential step to determine. This will be followed by setting goals and objectives, alternative courses of action and selecting the most feasible one.

The process will start with defining services and functions to be performed at each level of Primary Health Care system, available resources in terms of money, manpower, physical facilities and management capabilities, present and future roles of the facilities. Such information data base and feasibility study will provide scope for better utilisation of limited resources and

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to set priorities. Priorities should also be set in terms of both short and long term programme so that it will be economically and physically feasible.

Functional and Physical Evaluation of existing situation will result in building up the needed data base, with the aim that proposed facilities can be made to perform effectively and efficiently in terms of: space utilisation, deployment of staff, logistics of supply; suitability of design and maintenance of building fabric and equipment; ensuring improvements in future design and operation of health facilities(49). The study will also help to build up ideas on existing and projected workloads of various units e.g. categorised out-patient visits, admissions and patient days by service and so on. It is needed to understand the utilisation of existing facilities and thus to develop a space programme.

This phase is mostly ignored in Bangladesh. Planning and design phases are dealt by two different organisations (e.g. the Health Ministry/ Planning Commission and PWD/Private consulting firms) without any direct communication and sharing of information. The planners remain unaware of what information architects need for design, while the designers have little knowledge about user's need, their workload and problems in the existing facilities. Hardly any evaluation is made before planning and designing these facilities. Whatever piecemeal actions are taken by aid organisations, Government Departments, PWD/private firms like field trip, decisions taken in the joint meeting are not recorded for the benefit of future planners and designers.

3.3.2 Selection of Location of Building Site:

The objective is to provide PHC facilities accessible to the whole population, enabling two way communication between the facility and a higher level for referral and the necessary logistics to maintain supplies.

The conditions which are necessary to take into account for selecting location and building site are:

Location:

- population density and distribution
- geographical features

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- communication network, convenient access
- travel time and distance
- existence of supporting units and existing health care facilities

Site:

- suitable access from main communication network
- site area sufficient to accommodate future expansion possibilities.
- environmental quality and safety considerations
- soil condition, availability of water supply, sewage disposal and other services.

Method:

- collect information on population density, geography, communication network, existing health facilities
- the information can be transferred to a country map showing probable location
- use of check list for site analysis
- selection of site from alternatives (if there are any) after analysing all necessary conditions.

In Bangladesh context site selection might result from political pressure. If some control cannot be maintained through guidelines will cause problems of accessibility and proper distribution. So it is necessary to evaluate from existing situation the causes and effects of the selected sites.

3.3.3 Project Brief:

The brief is an essential prerequisite for a successful design. It should clearly set out the services to be provided, functional content, workload of the health care building, staffing pattern, organisational structure and management of functions, services and staff.

3.3.3.1 Operational Policies:

Operational Policies are one of the most important parts of the clients brief to the design team. It is a statement of intent regarding the operation of a particular service or activity areas. Operational Policies are needed to determine the aims and objectives of each function; assess the feasibility of the proposals; explore the possibility of alternative solutions; establish the priorities for resource allocation. It is a means of communication among different members of planning,

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design, commissioning and evaluation teams.

It is generally done at two levels:

Whole health care unit relating to matters affecting all or most of the building (i.e. patient care, supply, disposal etc.) and Departmental/activity areas relating to the internal organisation of a specific department/ activity areas (i.e. wards, out-patient areas).

In order to collect and record the statement of intent the following system is preferred:

Scope: The section should answer the question of 'What is to be done' covering purpose, principal functions/ activities, subsidiary functions and support functions.

The aim here is to determine the purpose of the specific activity area/ areas or service. It should also specify the important factors to be considered in relation to that area or service. For example the scope of an outpatient area can be defined as follows:

'To provide preventive, promotive and curative services to all ambulatory patients as efficiently as possible keeping in view reduced waiting time, patients privacy and quality of care.'

These criteria/ factors will vary from one activity area to the other and also to some extent from country to country. This section should also list the principal, subsidiary and support functions.

Method:

- establish standard clinical procedures
- national strategic plan
- analysis and evaluation of existing facilities
- define user's requirement

Scale: Answers 'How much is to be done and by whom'. This section includes workload and staffing implications.

The purpose is to determine the workload and staffing pattern of individual activity area. The workload will also vary from one area to another e.g. while workload of inpatient care is determined by number of beds per ward, specialty, grouping etc., the workload of out-patient care is determined by number of clinics, time table and so on. It is also necessary to state

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number and category of staff and their time table.

Method:

- determine from existing situation the staffing pattern and workload. It should also include future projections.
- alternatively it is possible to calculate number and category of staff with workload. For example many of the data for calculating workload and staffing pattern can be based on empirical studies e.g. travel time, density of population, average consultation and treatment time etc. But this procedure needs local adjustment.

Organisation:

It is imperative to know how the individual activities should be performed within each activity area/ unit before going to actual design. This will enable the designer to conceptualise the organisation of individual activity area or whole health care unit.

It should cover the following:

- the method of performing activities/ functions.
- participants, equipment
- policies affecting organisation within the activity area/ unit and among areas
- quality of relationship - primary or secondary
- possibility for shared use of space, flexibility
- expected or anticipated changes (if any)
- socio-cultural aspect, environment (e.g. privacy, security)

Method:

- existing policies
- user's requirement
- observation and analysis of existing procedures
- comparison with standard procedure

All this information can be collected in the format of a check list dividing each task into stages with specific questions on subject areas.

Management:

The aim is to determine who will manage the individual activity areas and whole unit and how.

Method:

- actual process taking account of problems in the process.
- diagrams showing management structure

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After preparing the Whole Health Care Unit policy and the outline operational policy of each section, it is necessary to develop a Development Control Plan for each level of facility. It is helpful to understand the organisational principle of the individual units and their relationship. It can be in the form of a schematic layout without reference to actual size.

It is evident from literature review that little regard is paid to prepare a proper project brief encompassing operational policies, activity analyses, room data. As well as it is hard to identify the basis of determining the accommodation schedule which is found same for most of the UHFWCs. The field investigation will result in establishing the relation between operation and design.

The following aspects should be taken into account while preparing operational policies for Health Post, UHFWC and UHC:

- difference in scale between UHFWC and UHC
- identify common activity components in HP and UHFWC, and also in UHFWC and UHC
- distinguish difference in scale, staffing and operational policies of those activity components or any technological differences.

3.3.3.2 Activity Analysis:

Activity analysis is required to assist the designer and planner by giving clear ideas about the user's real requirements. To have a clear and comprehensive statement of the user's requirements there is a need to analyse each activity which occurs in a space or through a succession of spaces. To provide only a schedule of accommodation is insufficient for design development or building process. The analysis can be expressed through Activity Data Method, the purpose of which is to provide the designer with as complete a statement as possible of his client's requirements before the design stage is reached.

Designers can use above information to accommodate required activities in the building and to decide what arrangement of rooms or spaces will provide the best solution within the sum the client is prepared to pay. The information from activity analysis can also be used to prepare

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Room Data Sheet. Activity analysis can be done at macro (e.g. patient flow for diagnosis and treatment) or micro (e.g. clinical hand washing) level.

Activity analysis answers the question of ' what people will do' and 'how they will do it' and provides to the designer the idea of user's intended and anticipated activities.

Method:

- list all the activities
- state scope of activities
- show sequences of activities including: participants (e.g. patient, nurse, doctor etc.) essential equipment, furniture environment essential criteria/ condition (e.g. privacy, confidentiality etc.)

All the above information should be gathered from analysis and evaluation of existing facilities and interview of users. A suitable check list can be used to collect information. Some projection should be made to include possible future activities.

These analyses can be expressed through:

1. List of activities
2. Activity Data Sheets
3. Link Analyses

For simplification of the analysis it is also possible to categorise activities according to participants.

In Bangladesh there is a complete lack of this kind of information. There is a need to see what are the activities and their sequences and how these are performed within the existing buildings and how best these can be accommodated to achieve the user's working efficiency and need.

3.3.3.3. Schedule of Accommodation:

The Schedule of Accommodation should include ' a list of activity spaces accommodation for a particular unit, giving the name of the various rooms or spaces, the number of each, and possibly their net floor area.' (37, p.79)

Method:

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- list from activity analysis and operational policies required spaces and rooms (name of the space/room + number) taking account of possible multi-use and shared use of spaces
- derive minimum dimension of each room from room data and ergonomic studies
- calculate net area
- include area for circulation
- total area

The following format can be used: (see Table 3-1)

Serial Number	Activity Space	Quantity	Total Area
---	---	---	---
---	---	---	---
---	---	---	---
Net Total	---	---	---
Circulation etc.	---	---	---
Total	---	---	---

Table 3-1: Schedule of Accommodation

The schedule of accommodation for public health buildings in Bangladesh are mostly derived from personal experiences and formulated after only threadbare discussions (51). It is now important to find out what is the difference between once produced accommodation schedule and those developed from a step by step method, whether a considerable savings can be made considering flexibility of space use, time tabling or any other method.

3.3.3.4 Room Data:

Room Data Sheet is a detailed list of finishes, engineering services, loose equipment, fixture and fittings, environmental and other requirements for a particular room. It may also include data on the room's functions. It relates directly to the room layout.

Room Data Sheet should cover the following:-

Individual activity/ group of activities:

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- participants
- duration and frequency of activities
- minimum space required, size and shape
- direction of light source and access
- environment
- services
- list of furniture and equipment

It might be most useful for the architects in Bangladesh. Instead of providing a type design, data on individual room or some other form might give them better options to produce design suitable for the particular site, size and type of buildings and at the same time requiring less time to collect data.

3.3.4 Design Guidelines:

A. Building Strategies:

The following strategies have been identified:

Environmental considerations:

The health buildings should provide a comfortable indoor environment for the users. The climatic measures taken at the design stage should be responsive to local conditions and climate. In order to achieve that the following method can be suggested:

- Identify climatic elements(e.g. solar radiation, prevailing wind, humidity, rain.), their relationship and those particularly important for Bangladesh.
- Study the effect of climatic elements on indoor comfort conditions.
- Identify building elements(e.g. roof, wall.), built form, building material, finishes and construction method which can be used to modify climatic elements and provide comfortable indoor environment.

Information can be gathered from relevant literature, research work in this area, observation and discussion with users of existing health buildings. Lessons can be learnt from existing practices to achieve comfort conditions and their impact on users perception.

Use of local technology and material:

Local materials and techniques should be used in order to meet local requirements with

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respect to climate and topography, to accord with local vernacular architecture and to save money. The following underlying factors are identified for developing recommendation:

- availability of manpower for construction and possibility for self help capabilities
- existing transport network and accessibility to sites
- financial feasibility for choosing between imported and local materials and techniques.
- future maintenance possibilities.

Such understanding can be developed from field investigation and literature search.

Clinical technology: technology used for sterilisation, treatment and other clinical procedures.

Water supply, sewage disposal and drainage, electricity and sources of energy for lighting, cooking, sterilising.

Flexibility and provision for future growth and change:

- identify unchanging aspects, cyclical changes and progressive changes
- possible multi use of spaces; grouping of similar activities to enhance multi use of space.
- standardise minimum dimension
- use of modules
- circulation pattern

Other strategies:

Local customs/ habits

Functional efficiency

Traffic movement and circulation

Control of infection

Economy in capital and running cost with acceptable medical standards.

B. Design Development:

Concept: e.g. model unit, standardisation of activity components, flexibility, phased construction, need for future growth and change, response to local condition, level of technology and resource constraints and so on.

Activity grouping and inter-relationship: The aim is to achieve an optimum pattern of

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relationships among the functional areas of the health building determining correct location of each area in relation to others, reducing traffic movement and making traffic flow as reliable as possible. While grouping different activities or zoning of functional areas, the following aspects should be given priority:

- functional efficiency of each activity and interrelated activities.
- easy supervision of traffic movement
- maintaining privacy and security as required.

Inter-relationship of activity spaces depends to a great extent on traffic pattern. Different methods can be used to determine traffic pattern, one of which is the use of Traffic Matrix.

Criteria for each space (social, behavioral, spatial)

Zoning of activity spaces:

It is also essential to identify different categories of traffic movement within the health building e.g. patient, staff, supply of goods etc. In the design a clear distinction is necessary between these groups. The zoning of activity spaces can be developed from the analysis of different activities, sequences of activities and the resulting space implication. For example for a health centre it can be divided into three distinct zone: the public zone, the joint use zone, the staff zone.

It is also essential to maintain a suitable relationship between these zones as well as relationship of spaces within each zone. Different link diagrams can be used to show within zone and between zone relationship e.g. bubble diagram, flow chart, schematic diagram.

C. Design Proposal: Based on the planning and design guidelines the aim is to develop alternative design proposals for individual units.

It is necessary to develop a basis for deciding the surface area, layout, room size and shape. From field survey it is useful to search the basis of deciding these, whether these are meeting the existing user's requirements. This will also help to establish how the different building strategies like environmental considerations, use of local materials and techniques,

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flexibility for future growth and change, infection control and so on are taken care of in the existing designs and if there are problems how best they can be achieved in future designs.

It is also essential to develop a concept for design, to search for the problems in the existing approaches e.g. one-off design, type design and find out the alternative one which will meet the need for designing future PHC facilities.

3.4 Conclusion:

A theoretical model of planning and design guidance and method is developed based on the review and analysis made in chapter two. It is presented in a clear framework from need identification to design proposal. A clear definition of stages in a step by step method and identification of tasks under individual stages are considered to be important for an efficient planning and design of PHC facilities. Each stage describes aims and objectives, scope, criteria and method of work.

It is found useful to identify the area where the proposal will focus on planning and design guidance. The steps and tasks identified are also helpful to formulate a check list of questions and delineate the areas to be covered during field investigations. Thus the model is presented as the base against which the facilities can be evaluated and feed back information received for developing the proposals.

CHAPTER FOUR

EVALUATION AND ANALYSIS OF EXISTING PHC FACILITIES - A METHOD FOR SURVEY

Chapter Four

CHAPTER FOUR: EVALUATION AND ANALYSIS OF EXISTING PHC FACILITIES - A METHOD FOR SURVEY

4.0 Introduction:

Following the announcement of the first five year plan in 1973, a number of PHC facilities were built. The majority of the buildings are 'type' designs, while the rest are upgraded and renovated from existing buildings. But, there has been hardly any attempt to evaluate the functioning of the existing buildings before constructing the type plans. Moreover no attempt has yet been made to assess the successes or failures of the designed buildings before applying the same design throughout the country. According to Kleczkowski and Nilsson,

" If mistakes are to be avoided, it is important not to construct a large number of buildings of a particular design before the earlier ones have been fully evaluated."(64, p.31)

Because of the time and money implications the planning and design process did not continue through the evaluation stage. Even though evaluation of existing buildings in use is indispensable both to building improvement and the production of future guidance.

In Bangladesh the designs as built are based mostly on personal experience rather than actual feedback from evaluation. This may cause the same mistake over a number of similar buildings. In the first instance evaluation may appear to involve extra money, manpower and time, but, in the long run, it will save constructing a large number of buildings which do not provide adequate service or user satisfaction.

Moreover medical practice, technology, the general health situation, population figures and the economy are constantly changing. Without a periodic review of the existing situation these factors cannot be taken into account in the planning and design for future buildings or improving the functioning of existing buildings.

Consequently for this study it was decided to carry out an in situ evaluation of existing public PHC buildings, the Upazilla Health Complexes (UHC) and Union Health Family Welfare Centres (UHFWC), to fill the gap due to lack of any previous studies in Bangladesh. This

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evaluation through field survey will cover the health centre buildings from where PHC are provided excluding staff accommodation and other ancillary buildings within the same site. The theoretical model developed in Chapter Three will be piloted and verified in the field situation with the intention of proposing a practical solution. The study will be conducted in order to get a clear picture of the functional and physical requirements for the PHC facilities covering aspects such as space utilisation, operational procedures, use of staff, health care techniques, building design, supply and disposal, maintenance of building and equipment. This list is not in order of priority.

The following criteria are the ones selected for evaluation:

- functional adequacy and effectiveness
- appropriateness of physical provision/ built environment
- flexibility, growth and change
- local appropriateness with respect to custom, habit, technology etc.

The study on survey and evaluation has been divided into two sections. The first deals with the theory of evaluation and its methodology (Chapter Four). While the second discusses the survey results (Chapter Five).

4.1 Evaluation:

Evaluation is an essential part of the building process e.g. briefing, design, construction, commission and evaluation. Rawlinson defined Evaluation in 'Health Building Evaluation Manual' as:

" a process of measurement, comparison and interpretation which should influence the planning and design of new buildings through its impact upon briefing and building guidance."(104, p.1)

Results from a building evaluation help to improve functional efficiency, space and staff utilisation, supply and maintenance of building equipment. Also these results are useful to formulate legislation and policies. In the opinion of Postill (100), a careful analysis of shortcomings results in recommendations for physical, functional and or organisational changes which ultimately improve building efficiency.

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A good evaluation records the strengths and weaknesses of a facility, its successes and failures, local characteristics, functional requirements, movement of people, goods, things and ideas and the lessons learnt from real-life situations become a base for future plans and programmes.

Type of Evaluation:

Evaluation may cover different aspects of a health building project e.g. functional, physical, economy, the cost in use and so on. For the purpose of this study only physical and functional evaluations will be undertaken.

"Whereas the physical evaluation is concerned solely with physical 'measurable' characteristics of the hospital plant, the functional evaluation is concerned with functional features- that is, factors that affect the facility's ability to serve as an efficient workshop for personnel and as a supportive environment for both personnel and patients." (49, p.123)

The purpose of physical and functional evaluations is identified by Hardy and Lammers (49) as:

Physical evaluation:

- to identify problems and deficiencies that detract from efficient operation,
- to determine physical characteristics that do not conform to minimum standards/ codes, or detract from the safety and comfort of building inhabitants
- to estimate degrees of obsolescence
- to assess serviceability in meeting future needs
- to provide a basis for recommendation as to possible alternative actions e.g. modernisation, expansion, phasing etc.

Functional evaluation:

- identify functional deficiencies due to site and building affecting operational effectiveness and efficiency,
- determination of functional features that do not conform to current minimum standards
- appraisal of layout from the standpoint of flexibility and expandability for future building programme
- to provide a basis for recommendation as to possible alternative action as in physical evaluation.

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Stages of evaluation:

Evaluation can be carried out at different stages e.g.

1. evaluation of options
2. evaluation of design
3. evaluation of building as built
4. evaluation of building in use

A number of PHC buildings have already been running for several years. It is now essential to see how these buildings are functioning i.e. whether the provision increases or hinders the user's working efficiency. This type of evaluation is known as Post Occupancy Evaluation (POE) and is now doubly important in order to establish how the type plans are performing in different areas of Bangladesh.

Levels of evaluation:

Evaluation can also be done at various levels of health building:

- a. whole building - for testing newly completed and prototype buildings. Also useful for future designs.
- b. selective evaluation of particular aspects/ departments - for examining building performance, deciding need for relocation or expansion of departments and for future designs.
- c. one-off evaluation in a single health building
- d. comparative evaluation across a number of health buildings.

This study will concentrate on evaluating a number of PHC buildings (e.g. UHFWC, UHC) scattered all over the country covering physical and functional aspects. In order to collect data and information for evaluation a field survey is designed specifically for the study.

The following stages for conducting a survey are suggested by Phillips (99):

- defining the research problem
- deciding the kind of method
- setting on a target population
- choosing the appropriate sampling method
- selecting the sample
- selecting methods of measurement
- wording the questions
- designing a questionnaire

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- piloting
- organising the field work
- checking, editing and following up replies
- preparing and processing the data
- analysing the findings
- writing up the results

The first stage has already been covered in the former sections. The purpose and objectives of survey, survey method, sampling method through organising the field work are discussed in the following sections. The survey findings are presented in chapter five.

4.2 Objectives of the Survey:

After developing the theoretical model determining outline content and framework of guidance, an empirical investigation is considered essential to ensure its practical applicability. The following broad objectives are chosen for the survey:

1. describing the location and range of functions of health building
2. testing the functional efficiency
3. testing the adequacy of the built environment

The purpose of the survey is to collect all relevant data, information and documents in order to evaluate the PHC buildings physically and functionally. The following information will be elicited:

A. General aspects:

1. Role of health building/ service plan
2. Type, size, catchment population
3. Existing resources - money, manpower and facilities
4. Location, site and services.

B. Functional aspects:

1. Operational procedures and policies - whole building and individual functions e.g. out-patient, diagnostic and treatment, supply and disposal, maintenance, in-patient and so on.
2. Activity and activity pattern - how activities are performed within the building.
3. Activity spaces and space utilisation - whether the activities could be performed efficiently within the space provided.

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C. Physical aspects:

1. Layout of buildings - building design, adequacy and effectiveness of built environment
2. Construction techniques
3. Room shape, size and organisation: whether any standard or guidelines followed; basis of space organisation
4. Growth and change: identify the growth and changes that has taken place from the initial design and use of buildings and future possibilities.

D. User's comment: whether they are happy with the built environment and their felt need.

The checklist of information is selected based on the model guidance.

4.3 Methodology:

Data and information collection for the physical and functional evaluation will be based on existing information and actual field survey carried out specifically for the study. Existing information can be collected from different government and non government publications, circular, project reports, articles and so on e.g. information on catchment population, intended functional content of building, site and floor plan, capital cost etc.

Field survey, comprising facts and user's opinions will be collected following a systematic method. Selecting an appropriate method for choosing representative sample and gathering data is important so that the required information can be collected within the time and resources allocated for the survey.

4.3.1 Selection of Sample:

According to Rawlinson in " The development of a classification framework for selecting case study hospitals" (105), there are two approaches for selecting case study hospitals e.g.

Approach one:

- "a. Derive set of classification criteria.
- b. Keep some criteria constant.
- c. Select hospitals according to remaining selection criteria (considering only those hospitals which meet restrictions in b)
- d. Repeat steps b and c as required taking different groups of 'control' and 'selection' criteria from set derived in a.

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Approach two:

- a. Establish set of classification criteria.
- b. Select series of hospitals, each of which incorporates distinct 'interesting' features.
- c. Describe hospitals using classification criteria."(105, p.3-5)

The approach one is suitable for useful comparison across a number of hospitals and their differences can be attributed to the selection criteria. Also due to the use of classification criteria, each case study represents a broad group and some generalisation can be made. Though the selection of case studies in approach two is straight forward, the observed differences cannot be attributed to a specific difference between them and make generalisation more difficult.

The purpose of the study is to get a clear picture of existing UHFWC and UHC in-use and also to get an idea about any major variation due to different location, design and also users. All these need to be covered within limited time and resources available. For that reason it is found useful to classify the units according to certain criteria, as in approach one, so that each unit will represent a group of similar type of units. This will also enable the generalisation of information which is an essential criteria for preparing guidance.

The survey will cover only those facilities which are providing similar package of services as envisaged in the five year plans and of the same size e.g. 31 bed UHC and UHFWC providing comprehensive health and family planning services. This will help useful comparison as well as generalisation.

The following criterion are chosen for sample selection based on the aims of the survey:

1. Nation-wide distribution
2. Variation in design - old/ upgraded and new/ type designs
3. Catchment area and population variation

There is little variation in shape and form of the buildings as majority of them are 1 to 2 stories high and of similar type design. Thus shape and form of buildings are excluded from selection criteria.

1. Nation-wide distribution: The existing facilities are scattered all over the country following the administrative pattern. There are 4 Divisions, the largest administrative unit, in Bangladesh. To get geographical variation and also to represent the PHC facilities throughout

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the country an attempt will be made to select the same number of facilities from each Division. Again care will be given to select each unit from different Districts within each Division.

2. Variation in design - old/ upgraded and new/ type designs: Since one of the objectives is to study the growth and change, it is essential to survey old/ upgraded facilities along with new/ 'type' designs. Among the UHC there are two basic variations-a. those which were designed before 1976, and b. those which were designed after the announcement of five year plans and built according to 'type' plans. While all the UHFWCs are built after 1976, a number of the old Rural Dispensaries are upgraded to UHFWC. Attempt will be made to take examples from both groups- old/ upgraded and 'type' designs.

The variation in design will also help to get variation in surface area, individual room size and shape.

3. Catchment area and population variation: It can be found from Appendix 3.1 there are variations in catchment area and population within the unions and upazilas. To get an impact of catchment area and population over the size and use of the unit, it is decided to take units from different sized catchment areas.

The following diagram can be used to show the selection criteria: (see Table 4.1)

Selection Criteria		No. of selected UHC	No. of selected UHFWC
Criteria 1: Nation-wide distribution	Dhaka Chittagonj Khulna Rajshahi		
Criteria 2: Variation in design	Old/ Upgraded New/ Type design		
Criteria 3: Catchment area and population	Below and above national average		

Table 4-1: Selection criteria

Since the intention of the survey is to get information from a unit which is functioning

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for a number of years (e.g. 2 to 3) which is sufficiently known and used by the community, it has been decided to exclude those facilities which are constructed after 1987. Here 1 to 2 years are included for construction and commissioning stage.

The sample will be selected in such a way to make inference about the whole group. The group here is UHFWC and UHC constructed according to three five year plans. The intention is to select a suitable sample from it. For selecting the sample it is necessary to have 'Sampling Frame', the listing of the total target group, which is used as the basis for selecting the individual members of the sample. (99) But there is hardly any publication which provides the complete picture of a sampling frame. Even there is confusion regarding the actual number of facilities functioning at present and also the terminologies used to describe the facilities. (see appendix.3.2 for example)

In this respect the officially published and widely circulated Statistical Year Book of Bangladesh is used as the main source of data. According to the 'Statistical Year Book of Bangladesh 1989' there were altogether 354 UHC and 985 UHFWC in 1987. Of the 354 UHC, 151 units were constructed before 1976 and 203 units from 1976 to 1987 based on type designs. About 985 UHFWC were constructed before 1987 and around 100 from 1275 RDs were upgraded. The objective is to provide comprehensive health and family planning services through these UHFWC and upgraded RDs.

Due to time constraints and physical accessibility it has been decided to select a sample of UHFWC and UHC which will be feasible to evaluate within the stipulated time and resource available and at the same time represent the overall facilities throughout the country. Within the 26 weeks in Bangladesh, the first four weeks will be needed to pilot and organise the whole survey work, 20 weeks for actual survey/ field work and last 2 weeks for compilation of data.

Physical distances may not be great for some facilities, but due to slow and poor communication network, travel time is extremely high in Bangladesh. For example it can take 4-6 hours to travel to a union which lies only 8-10 miles from Dhaka, the Capital. So it will not be possible to cover more than 2 to 3 units (an average of 2.5 units/ buildings) in a week, which will make possible survey of around 50 units/ buildings.

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The following guidelines are used for choosing case study units:

1. The broad classification of the units are:

UHC - 151 old and 203 new/ type designs = 354

UHF WC - 985 new/ type plans and 100 upgraded = 1085

The proportion is 1:3.

Out of 48 units it comes around 12 UHC and 36 UHF WC. (around 3% from each group)

2. For nation-wide distribution it is necessary to have similar distribution over the four Divisions. So out of 48 case studies, 12 units will be selected from each Division.

3. To get variation in design it is necessary to have some representation of both groups - old and new/ type designs. Most of the type designs are the same and it is pointless to get similar information over and over with fewer representation of design variations. Also to get nation-wide variation the following choice is made:

a. UHC:total number= 12, 3 in each Division. It is decided to take 6 old and 6 type designs.

b. UHF WC: total 36, 12 in each Division. It is decided to take at least 2 upgraded/ old from each Division and the rest from type designs.

4. While selecting the units from each Division care will given to consider catchment area and population variation (e.g. below and above national average which is 750 per sq. Km.)

5. As it is time and resource consuming to prepare detail drawings on site, for old and upgraded buildings availability of detail drawings from PWD and private consulting firms will also be considered as a criteria for selection.

The above classification criteria and other considerations based on the aims and objectives

of the survey results in the following choice of case-studies:(see Table 4-2)

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Division	UHC old	UHC: new/ type design	UHFWC old	UHFWC new/ type design
DHAKA	2	1 (*)	2	7
CHITTAGONG	1	2	2	7
RAJSHAHI	2	1	2	7
KHULNA	1	2	2	7

Table 4-2: Sample selection

(*) The choice of 2 to 1 can be other way round and partly based on availability of detail drawings of old buildings.

The choice of the units based on classification criterion and time and resource constraints is expected to fulfil the survey objectives and results.

4.3.2 Method Of Data Collection :

For the purpose of survey and evaluation of existing buildings, both physically and functionally, it is necessary to adopt the best possible methods to acquire intended information. The following methods are found to be appropriate for the research undertaken:

A. Data collection through observation and recording:

This method is suitable for investigating phenomenon that can be observed directly by a researcher. It helps to understand the ways activities are carried out in a health building, the utilisation pattern of individual spaces, changes in the use of spaces, details and overall understanding of the built environment which is difficult to achieve through only questionnaire survey. Recording of observational study is essential to make it more systematic and for future analysis. This can be done in various ways e.g. use of survey format, notes on floor and site plans. Photographs can be taken to support such observations.

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B. Data collection from records and documents:

Records like in-patient admission and discharges, out-patient and emergency patient attendance, staff number and category and so on are much easier to collect from official records and documents. As much of these data are not possible to collect from one day visit. A questionnaire can be structured to record such information. Also detail floor and site plans are more difficult to obtain from on site measurement than to collect from concerned department or consulting firms.

C. Interview/ discussion with health building users:

To develop a clear understanding of the user's need, discussion with the user's of specific buildings and activity spaces within the building is essential. Informal discussion with the users is found to suit the purpose along with structured questionnaire and a check list can be used for recording the information collected.

4.4 Questionnaire design:

To achieve the intended objectives of the survey through the methods chosen, the next attempt should be to design the structure, format and content of the questionnaire including other methods of data collection. In order to arrive at the content of the questionnaire, a check list of required information is formulated from the model guidance, described in chapter three. This check list is later developed in the form of a questionnaire and other supporting materials (e.g. floor and site plans, room data) based on the best available method of collecting the required information. For example factual/ quantitative data of bed number in individual ward is presented in the form of tables, procedures of performing certain activities in the form of open ended questions, records on present use of spaces on plans. The questionnaire consists of both open-ended and close-ended questions. While arranging the sequence of the questions care has been given so that it is possible to collect all information while visiting and observing each individual space. This may reduce the time needed to cover the whole survey area and different methods of data collection. The questionnaire is presented in appendix. A-2.

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4.5 Arrangements for actual survey:

The overall survey period covered six months, from October 1991 to March 1992. The first month was spent on organising the whole task of information collection to pilot survey. This included collecting information on overall sample frame, selection of actual samples, collecting drawings of the buildings selected, arrangements for conducting the actual survey, selecting and training survey team members through pilot survey, piloting one UHC and one UHFWC within Dhaka Division.

Certain changes have been made on the initial design of sample selection and questionnaire. Prior to the actual survey work an inventory was made on materials (publications, minutes, articles and drawings) collected from PWD, HES consultants, Ministry of Health and various other related organisations. It was found that the public PHC package of services at the union level were only provided through the UHFWCs. The old existing rural dispensaries were only providing curative services and a new programme has been undertaken to replace a number of these by new type designs of UHFWCs. Thus it was decided to concentrate on UHFWCs constructed before 1987 and providing a similar package of services.

The table 4.3 and map in Fig.4.1 shows the actual facilities selected, their number and

location.	DHAKA DIVISION	KHULNA	CHITTAGONG	RAJSHAHI
	A1. Bhaluka, Mymensing. 2. Shibpur, Narsingdi. 3. Goalandaghat, Rajbari.	B1. Bakergonj, Barisal. 2. Mohammadpur, Magura. 3. Kolaroa, Satkhira.	C1. Begumgonj, Noakhali. 2. Raojan, Chittagong. 3. Chattak, Sunamgonj.	D1. Puthia, Rajshahi. 2. Ranisankail, Thakurgaon. 3. Iswardi, Pabna.
	B1. Tetuljhura, Savar. 2. Shamvupur, Shonargaon. 3. Joymontop, Manikgonj 4. Kaijuri, Faridpur. 5. Elenga, Tangail. 6. Birtara, Munsigonj. 7. KalikaPrasad, Kishoregonj. 8. Pubail, Gazipur. 9. Laxmigonj, Netrokona	B1. Dariapur, Narail. 2. Baradi, Chuadanga. 3. Parahati, Jhenaidah Sad. 4. Mukarimpur, Kustia. 5. Lebutala, Jessore. 6. Khazipur, Meherpur. 7. Lebukhali, Patuakhali. 8. Jatrapur, Bagerhat. 9. Dighalia, Khulna	C1. Fazilpur, Feni Sadar. 2. Chowara, Comilla. 3. Shuhilpur, Brahmanbaria. 4. Tamta, Chandpur. 5. Kuakup, Cox's Bazar. 6. Ranihat, Rangamati. 7. Monomukh, Moulavibazar. 8. Paniundha, Hobigonj. 9. Kuchi, Sylhet Sadar.	D1. Kamarpukur, Nilphamari. 2. Sabgram, Bogra 3. Tetulia, Dinajpur. 4. Kishoregari, Gaibandah. 5. Ekarachali, Rangpur. 6. Kamat Kagaldi - ghi, Panchagarh 7. Chowgram, Natore. 8. Khamar, Nowabgonj. 9. Varsha, Naoga.

Table 4.3 List of the Actual Facilities Selected

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Primary Health Care Facilities in Bangladesh

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A pilot survey was conducted on one UHC and one UHFWC to familiarise with the overall task of conducting survey work and to test the questionnaire. Although no major changes needed to be made on the questionnaire, it helped to organise the sequence of conducting the survey and deciding on from where to get which information and how to tackle situations like unavailability of required material and persons. For instance in UHCs it was found that information on patient's admission, attendance, staff number were recorded in different ways and not available in same format. Thus certain cross checks had to be made by collecting the same information from central administration and from different departments.

The literature search and other related information collection procedure, informal discussion with related personnel (architects, engineers, members from health ministry) continued throughout six months. Several offices and libraries were visited frequently in-between survey period e.g. Consulting Firms(ECA and Sthapati Sangsad), PWD, Ministry of Health, B.P.D.U., libraries of NIPOIT, GTZ and ICDDRDB. The actual field survey was conducted within four and half months. The last two weeks were spent on organising data, drawings and photographs for next phase of work.

A direct and informal approach was used to conduct the survey work and to get the real picture of the survey units. Approaching through concerned Ministry would create delay and might receive obligatory responses from the units. Also because of poor communication system (road, postal, telephone), it was not possible to pre-arrange with the survey units, especially with the UHFWCs. Attempt was made to cover the survey units within nearby Districts consequently, as far as possible, except those within Dhaka Division as which was the base for conducting the survey. Responses from all categories of staff and other users were spontaneous which helped to carry out the survey smoothly and within time.

It was planned to talk with the administrators of individual units first and subsequently each key members from individual functional areas using questionnaire designed for each functional area. For example nurse in-charge in the wards, pharmacist in the dispensary, laboratory technician in the laboratory and so on. Only in a few cases the UHFPO was not available. In those cases the MO in-charge was approached. For UHCs, the administrator

Chapter Four

selected a staff from the unit to accompany the survey team.

The questionnaire survey was supplemented by direct observation and informal discussion with staff and patients. The information on how activities were performed within the buildings, nature of built environment, present condition of building, materials and finishes, existing space use and changes from intended use, facilities, equipment and furniture available and their arrangement were collected through observation and recording on questionnaire, floor plans and taking photographs. A part of the questionnaire was filled up from official records e.g. catchment population, staff number and category, out-patient and emergency patient attendances, in-patient admissions, number of operations, delivery, x-ray taken per month/ year and so on. Floor plans and site plans were collected from the concerned architect's office. An informal discussion were made with key staff members from each functional areas and patients as far as possible using a checklist of questions on aspects like satisfaction with building environment, work load and space, facilities and services provided and so on.

Discussion with the patients were difficult because of their shyness, communication problem and physical condition. A number of them participated in the discussion, especially in out-patient areas and majority of them co-operated while taking photographs.

4.6 Conclusion:

The need for evaluation of existing facilities through survey and analyses is found to be indispensable in the context of the study. This is mainly due to the lack of any previous study, to identify successes and failures of existing buildings, to verify the model and to propose a practical solution.

It is important to develop a sound methodology before conducting a survey. A systematic methodology is followed from objectives chosen, sample selection through questionnaire design and analyses expected. Sample selection based on nation-wide distribution, variations in design, catchment area and population is expected to give a generalised and clear picture of the functioning facilities.

CHAPTER FIVE

EVALUATION AND ANALYSIS OF SURVEY FINDINGS

Chapter Five

EVALUATION AND ANALYSIS OF SURVEY FINDINGS

5.0 Introduction:

The objective of the field investigation was to evaluate the existing PHC buildings physically and functionally in order to develop an information base for future proposals. This chapter will concentrate on analysing and interpreting the survey findings on aspects like range of services, functions, facilities, physical provision and their adequacies and effectiveness, flexibility, growth, change, local appropriateness and so on. It is hoped to identify problems, user's requirements, the successes and failures of the existing provisions.

The survey findings and analyses are presented in a logical sequence from overall provision of services, facilities, staffing to individual activity spaces, space organisation, operational policies, physical facilities, furniture and equipment. The information on the UHCs is presented first followed by that on the UHFWCs.

5.1 UPAZILLA HEALTH COMPLEX (UHC):

5.1.1 General Aspects:

5.1.1.1 Location, distribution, size, catchment population and area of influence:

All the UHCs are located in the Upazilla Headquarters, the majority of which are within a range of 8 to 32 kilometers (km) from District Headquarters and 5 to 20 km. from nearest PHC facilities. The area of influence is not limited within the upazilla. A number of patients come from neighbouring upazillas. While a large number by-pass the facility to avail services from District or Teaching hospitals. The reasons identified are the close proximity of the UHC/DH/TH from their own UHC, absence of referral system, availability of medicine, quality of service and availability of medical personnel.

It is generally expected that there will be a relationship between the size and number of

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health facilities and the catchment population, area and population density. But from the Table 5-1, no such relationship can be deduced. Thus the same size and number of facilities were provided in Goalandaghat, Ranisankail and Raujan with catchment populations of 77268, 122836, 267875 respectively. The Government policy to provide one 31 bed UHC in each of the upazillas with population variation of 40000 to 500000 is the underlying reason for the above situation. Moreover, the population growth rate (2.7% per annum) is high and the density of population will increase from 631 persons per sq.km (1981) to 1396.3 by the year 2000, as such demand for PHC services.

Name of the UHC, District	Area of the resp. district (sq.mile)	Population of the district ('85) (in '000)	Population density of the district.	Catchment pop. from off. record ('87-'88)	No. of UHCs ('87-88) in Distr.	Bed No. in UHC (off. record)
A. DHAKA DIV.						
1. Bhaluka, Mymensing	1544	3557	2304	216693	29	31
2. Shibpur, Narsingdi	431	1537	3722	194378	24	31
3. Goalandaghat Rajbari	426	784	1840	77268	20	31
B. KHULNA DIV.						
1. Bakergonj, Barisal	933	2120	2272	312468	21	31
2. Mohammadpur, Magura.	400	704	1760	145406	16	31
3. Kolaroa Satkhira	1451	1557	1073	150483	19	31
C. CHITTAGONG						
1. Begumgonj, Noakhali	1179	2070	1756	588815	11	31
2. Raojan, Chittagong	2013	5144	2555	267875	19	31
3. Chattak Sunamgonj	1365	1648	1207	215777	28	31
D. RAJSHAHI DIV.						
1. Puthia, Rajshahi	950	1788	1882	126994	27	31
2. Ranisankail Thakurgaon	702	944	1345	122836	19	31
3. Iswardi Pabna	900	1788	1987	211483	15	31

Table 5-1 Distribution, size and catchment population

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5.1.1.2 Infrastructure and service facilities:

83% of the complexes surveyed have metalled and seasonal road connection with District Headquarters and 25% of them have a nearby railway station. During the rainy season 33% of the UHCs are accessible by boat. The most available transportation is cycle rickshaw and rickshaw van. Bus services are available from the main vehicular road. During the dry season all UHCs are accessible by bus, motor car, auto rickshaw and rickshaw.

Tube-well and tap water systems are provided in all the twelve UHCs. Water is pumped from tube-well to overhead water tank and distributed throughout the building. There are no filtering procedures and no meter system either. Thus records of the usage could not be obtained for any of the complexes. All the UHCs had adequate water supply with pumps and tap water system in working condition.

The drainage systems of the complexes are generally poor. Rain water is drained to nearby low lying areas. For night-soil and other waste, septic tanks and soak-wells are provided. All the health complexes have electricity supply mainly provided by the Rural Electrification Board (REB). Power failure and fluctuation is frequent and none of them have any gas connection.

5.1.1.3 Services and facilities offered from the health complex:

The Upazilla Health Complexes provide out-patient, inpatient, diagnostic and treatment, emergency, administrative and support services. Specialties provided in these health complexes are general medicine, surgery, gynaecology, dental, MCH including under 5 and Family Planning. The services are delivered through the following main groups of activity areas:

- Out-patient and Family Planning
- Diagnostic and treatment (X-ray, pathology, emergency, EPI)
- Operating, delivery, F.P. sterilization
- Inpatient
- Administrative
- Support (Kitchen, store)

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Due to the lack of autopsy services bodies are sent to District Hospitals for post-mortems. There are facilities for teaching and training of field level workers, staff of UHFWC and RDs. Only 3 centres provide teaching facilities for medical students. The services provided in each of the sample UHCs are shown in the table 5-2, where variations are mainly due to the lack of trained manpower, equipment, supplies, space and management system.

SL.NO SERVICES	A:1	2	3	B:1	2	3	C:1	2	3	D:1	2	3
A. OUTPATIENT SERVICES												
1. Basic curative health services	/	/	/	/	/	/	/	/	/	/	/	/
2. MCH including under five	/	/	/	/	/	/	/	/	/	/	/	/
3. Family Planning	/	/	/	/	/	/	/	/	/	/	/	/
4. Health Education (prev. prom.)	/	x	/	x	/	/	x	/	/	/	/	/
5. Screening Referral	/	x	x	x	/	/	x	/	x	/	/	/
6. Surveillance and monitoring	x	x	/	/	/	/	x	/	/	/	x	/
B. DIAGNOSTIC AND TREATMENT:												
1. Radiology	x	/	/	x	x	x	x	x	/	/	x	x
2. Pathology	/	/	/	/	/	/	/	/	/	/	/	/
3. Treatment	/	/	/	/	/	/	/	/	/	/	/	/
4. Injection/ immunisation	/	/	/	/	/	/	/	/	/	/	/	/
5. Emergency	/	/	/	/	/	/	/	/	/	/	/	/
6. Operation (minor)	/	/	/	/	/	/	/	/	/	/	/	/
7. Delivery	/	/	/	/	/	/	/	/	/	/	/	/
8. Family Planning Sterilization	/	/	/	/	/	/	/	/	/	/	/	/
C. INPATIENT												
1. Accommodation for male, female, maternity and children	/	/	/	/	/	/	/	/	/	/	/	/
2. Infectious diseases	/	/	/	x	/	x	x	x	x	x	x	x
3. Recovery	x	x	x	x	x	x	x	x	x	x	x	x
4. Sanitary	/	/	/	/	/	/	/	/	/	/	/	/
D. SUPPORT SERVICES:												
1. Sterilisation	/	/	/	/	/	/	/	/	/	/	/	/
2. Catering	/	/	/	/	/	/	/	/	/	/	/	/
3. Linen/ laundry	(outside the H.C. premise)											
4. Supply	/	/	/	/	/	/	/	/	/	/	/	/
5. Disposal	/	/	/	/	/	/	/	/	/	/	/	/
6. Cleaning	/	/	/	/	/	/	/	/	/	/	/	/
7. Maintenance	(not regular)											
E. ADMINISTRATION:												
1. Staff accommodation	/	/	/	/	/	/	/	/	/	/	/	/
2. Teaching and training	/	/	/	/	/	/	/	/	/	/	/	/

Note: / = available, x = not available. A.1 Bhaluka 2. Shibpur 3. Goalandaghat
B.1 Bakergonj 2. Mohammadpur 3. Kolaroa C.1 Begumgonj 2. Raujan 3. Chattak
D.1 Puthia 2. Ranisankail 3. Ishwardi.

Table 5.2: Services offered from the unit

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5.1.1.4 Staffing pattern:

The staff includes medical, nursing, qualified technical and non technical staff. The number of doctors and nurses varied between 5 to 9 and 4 to 5 respectively. On the family planning side staff number varied between 4 to 12. There are 1 to 3 pharmacist/ compounder, 1 to 2 lab technician and 1 EPI technician. 58% of the UHCs surveyed have X-ray technician/ radiographer, 42% have dental technician, 25% have dental surgeon and 17% have leprosy expert. Administrative staff varied between 7 to 10.

Dual administration and management persists in majority of the complexes. While the Union Health and Family Planning Officer (UHFPO) is responsible for overall administration and management, Family Planning Officer is responsible for Family Planning side of the complex. In 4 UHCs, RMOs are responsible for wards, but majority of them are employed on ad hoc basis. Although according to official record 5 to 9 doctors were appointed to attend out-patient, inpatient and emergency, during field visits, not more than three doctors were found in any of the complexes.

There are in general 4 to 5 nursing staff or staff nurses. They are mainly qualified registered nurses with less than five years of experience. A number of female nurses have midwifery training. Usually the most senior nurse takes the responsibility to prepare the nursing roster. The nursing staff also includes male nurses who work in the emergency and O.T. Non technical staff includes administrative staff, ward-boys, ayas, sweeper, cook, driver and so on.

Shortage of medical, technical and nursing staff can be identified from sanctioned post and existing staff number in different complexes. Availability of adequate number of health personnel are essential for efficient service delivery. Shortage of dental technician, dental surgeon, X-ray technician, RMO, EPI technician, statistician are most visible. For example due to the lack of X-ray technicians, expensive X-ray machines are not in use affecting proper diagnosis of patients . Table 5-3 shows the staffing pattern in the health complexes.

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Category of staff	Sanctioned post/Establishment	Number of staff in diff. UHC											
		A			B			C			D		
1. Upazilla Health and F.P. officer (UHFPO)	1	1	1	1	1	1	1	1	1	1	1	1	1
2. Medical Officer	5	5	6	7	6	6	5	6	8	6	8	7	9
3. Resident Med. Off. (RMO)	1	1	x	x	1	x	x	1	x	1	x	x	x
4. Dental Surgeon	1	x	x	1	x	x	x	1	x	1	x	x	x
5. Leprosy Expert		x	x	x	x	x	x	x	1	1	x	x	x
6. Staff Nurse, midwife	5	5	5	4	5	5	5	5	5	4	5	4	5
7. F.P. Officer	1	1	1	1	1	1	1	2	2	1	1	1	1
8. F.W.V.	2	1	1	2	1	2	1	-	1	4	7	2	1
9. Medical Assistant	2	2	2	1	2	5	2	2	2	2	2	1	2
10. Health Inspector (HI)		4	3	1	5	3	2	9	5	5	2	2	2
11. Asstt. Health Ins		12	7	1	15	6	6	28	1	14	6	6	7
12. Sanitary Inspector (SI)		1	1	1	1	1	1	1	1	1	1	1	1
13. Pharmacist/ Compounder	2	2	2	2	1	3	1	2	1	2	2	2	2
14. Lab. Technician	2	2	2	2	2	1	1	2	2	2	2	1	2
15. X-Ray Technician	1	1	1	1	x	x	1	x	x	1	1	x	1
16. Dental Technician	1	1	x	1	1	x	x	1	x	1	x	x	x
17. EPI Technician	1	1	1	1	1	1	x	1	1	1	1	1	1
18. H.A.		-	-	-	2	-	-	-	-	-	-	-	-
19. Field Asstt.		-	-	-	66	-	-	-	-	-	-	-	31
20. Head Asstt/Accountant	1	1	1	1	1	1	1	1	2	1	1	1	1
21. Cashier	1	1	1	1	1	1	1	1	1	1	1	1	1
22. Store keeper	1	1	1	1	1	1	1	1	1	1	1	1	1
23. Clerk/ typist	1	1	3	3	1	3	1	3	2	3	x	x	x
24. L.D. Asstt.	2	2	^	^	x	x	x	x	1	^	3	x	3
25. Statistician	1	1	x	1	1	x	x	1	x	1	1	x	1
26. Driver	1	1	1	1	1	1	1	1	1	1	1	1	1
27. Junior Mechanic	1	1	1	1	1	1	1	1	1	1	1	x	1
28. M.L.S.S	1	3	6	4	3	7	1	1	4	2	12	6	4
29. Ward Boy	3	3	3	3	1	3	1	3	3	3	^	3	3
30. Ayas (female ward ast.)	2	2	2	2	1	2	1	2	2	3	2	2	2
31. Guard	2	2	2	2	2	2	1	2	1	2	2	2	2
32. Peon (male asstt)	1	mlss	<	<	1	mlss	1	x	mlss	1	mlss	<	<
33. Cook	1	1	1	1	1	1	1	1	1	1	1	1	1
34. Mashalchi	1	1	1	1	1	1	1	1	1	1	1	1	1
35. Sweeper	5	5	5	3	5	5	2	5	3	5	5	2	4

Note:

A. DHAKA DIV.: 1. Bhaluka, 2. Shibpur, 3. Goalandaghat; B. KHULNA DIV. 1. Bakergonj, 2. Mohammadpur, 3. Kalaroa; C. CHITTAGONG DIV., 1. Begumgonj, 2. Raujan, 3. Chattak; D. RAJSHAHI DIV. 1. Puthia, 2. Ranisankail, 3. Iswardi.

Table 5-3 Staffing Pattern

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5.1.2 The Health Building:

5.1.2.1 Site plan and building layout:

The purpose of the study is to determine the factors in the layout that enhance an improved operation and those that detract it. An attempt will be made to identify location of different areas, functional relationship, advantages and disadvantages of different type plans, aspects like privacy, security, movement of people, supplies and so on.

Site Plan:

The total health complex comprises of health building, quarters for nurse's, doctors and other staff and ancillary buildings (e.g. pump house, garage). In addition to these buildings male and female hostels are provided for medical students in Raozan, Chattak and Puthia. In general these buildings are scattered all over the site restricting future growth possibilities. Although the soil condition characterised by depressions, ponds and poor bearing capacity restricted the free use of land. Except Raozan, located in the hilly region of Chittagong, the other 11 sites have either large ponds or depressions later on backfilled by carted earth. The area of the sites in most cases are large enough to meet the present and future requirements. Total land area of the complexes varies from 2 to 9 acres.

The majority of the complexes have a single entrance from the main road, which not only serves the public but also the private accommodations. The sites are surrounded by boundary walls. Both the boundary walls and single public entrance enhances security and control over the whole complex. A network of internal roads links the buildings with each other. Minimum care has been given to develop the surrounding areas with landscape, especially in the new type designs. (see Fig. 5.1 to 5.11 for site plans)

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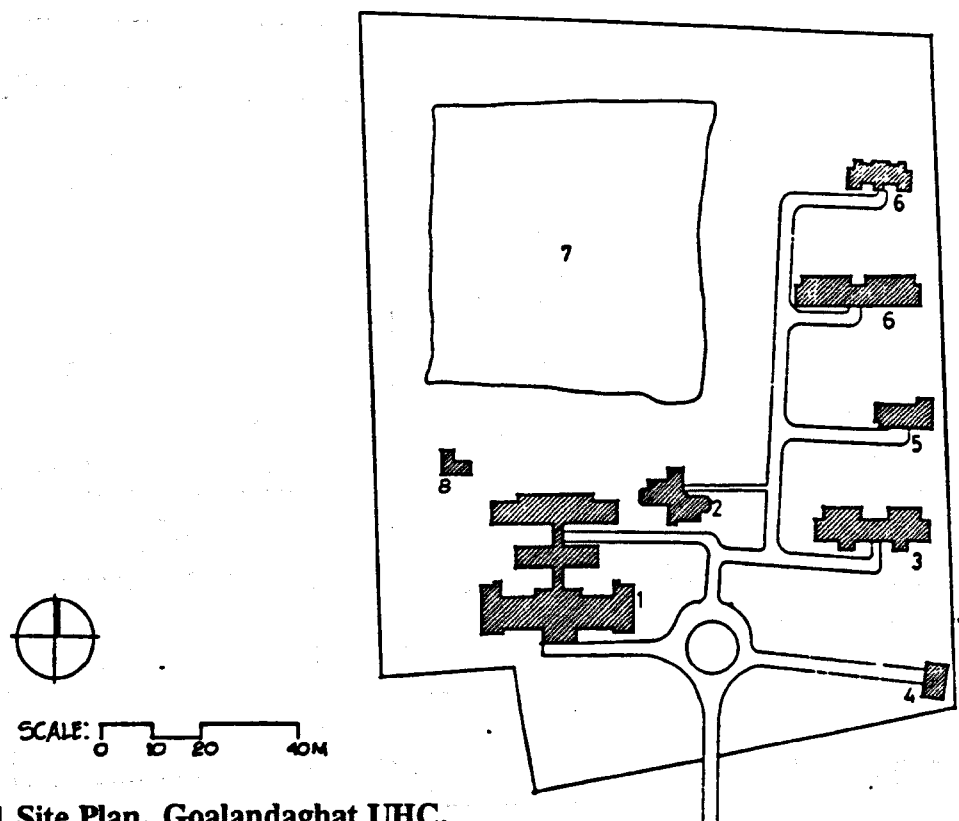


Figure 5.1 Site Plan, Goalandaghat UHC.

1. UHC (Health building); 2. Hostel; 3 and 4. Doctors Quarters; 5. Nurse's Quarter; 6. Staff Quarter; 7. Pond; 8. Pump house.

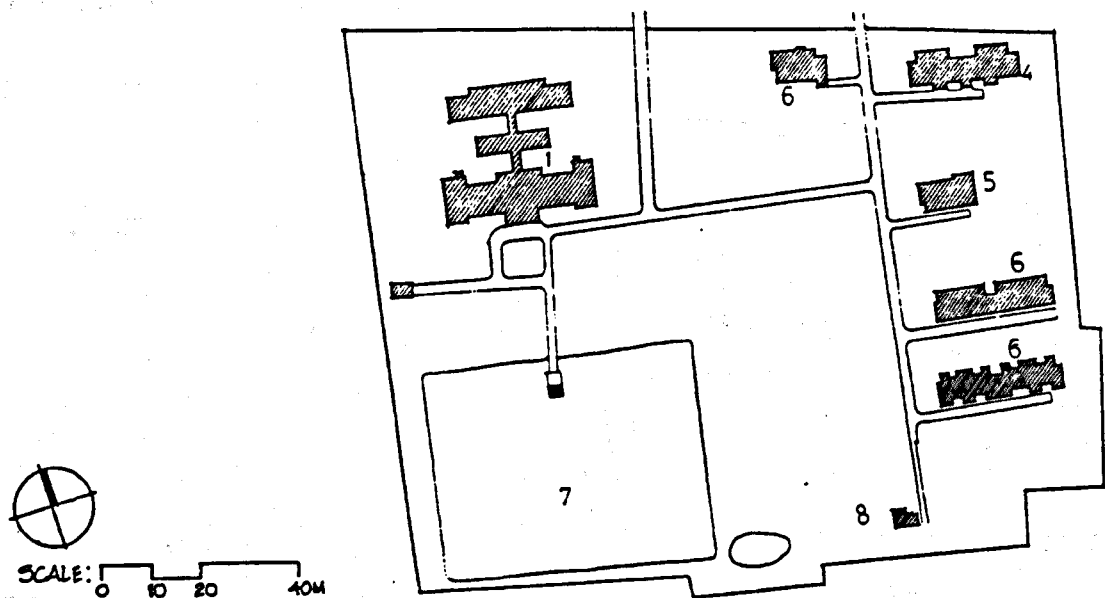
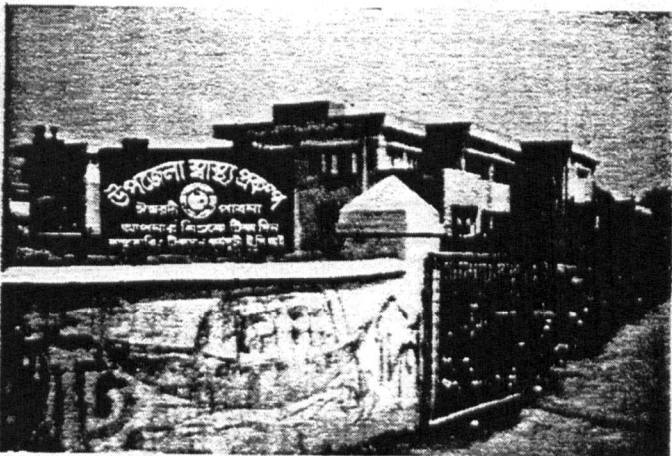
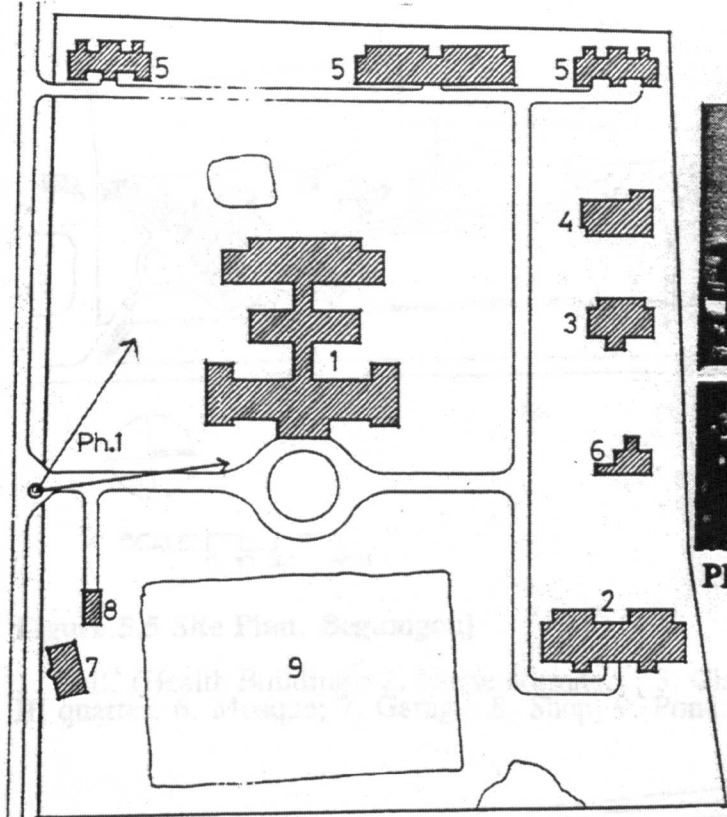


Figure 5.2 Site Plan, Kolaroa UHC.

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Ph.1 View of the health building seen from the entrance.(Ishwardi)

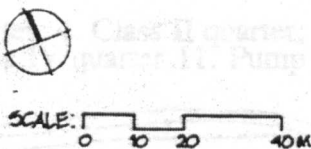
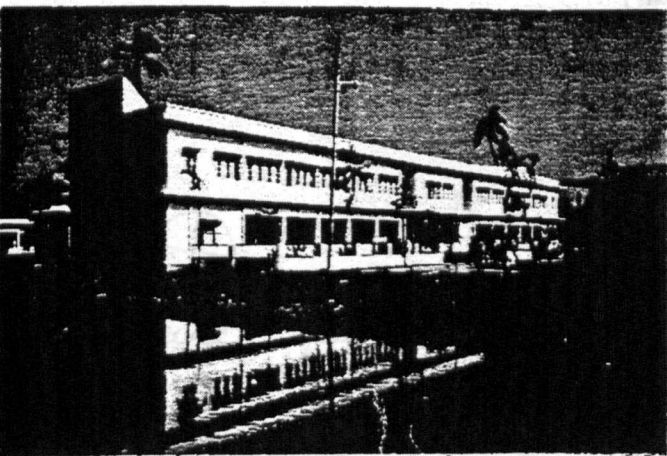


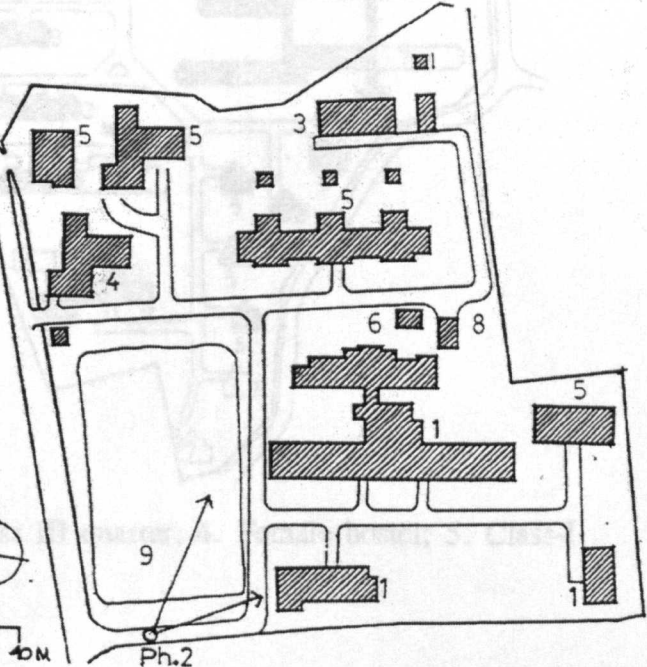
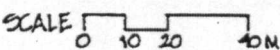
Figure 5.3 Site Plan, Ishwardi UHC.

1. UHC (Health Building); 2. Doctor's quarter; 3. UHFPO's quarter; 4. Nurse's quarter; 5. Staff quarter; 6. Pump house; 7. Mosque; 8. Garage; 9. Pond.



Ph.2 Exterior view of the health building showing surroundings including the pond.

Figure 5.4 Site Plan, Bakergonj.



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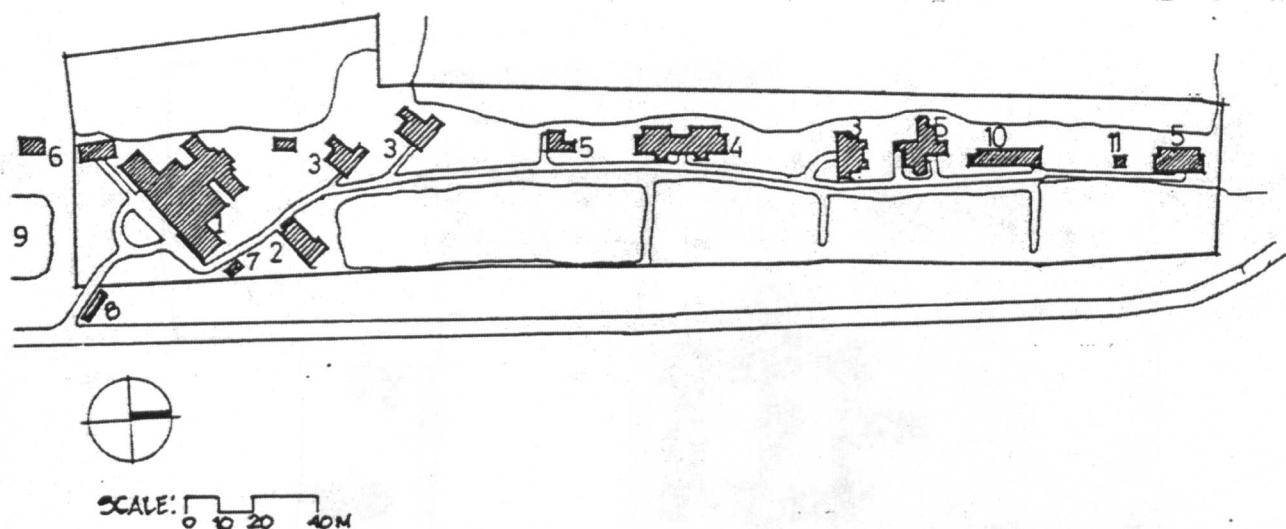
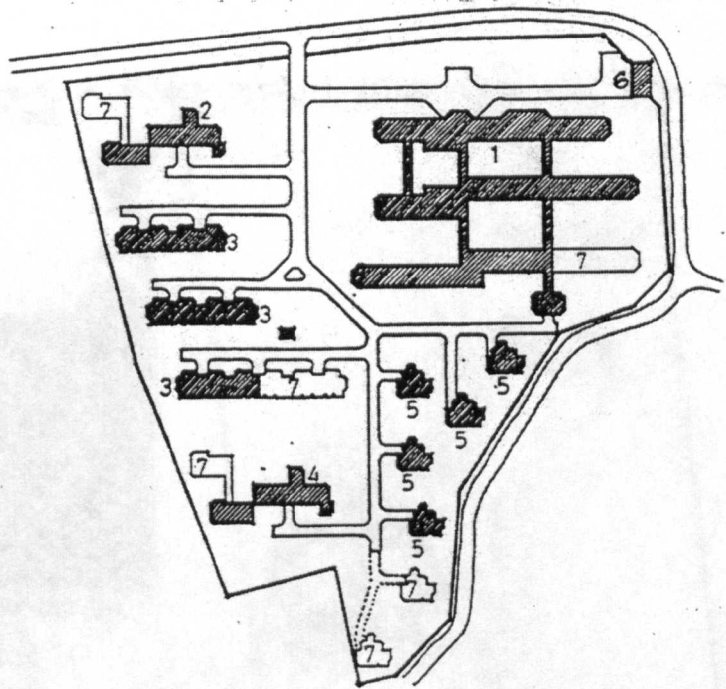


Figure 5.5 Site Plan, Begumgonj

1. UHC (Health Building); 2. Nurse dormitory; 3. Class I quarter; 4. Class II quarter; 5. Class III quarter; 6. Mosque; 7. Garage; 8. Shop; 9. Pond; 10. Class IV quarter 11. Pump house.

Figure 5.7 Site plan, Chandra

1. UHC (Health Building); 2. Male hostel; 3. Class III quarter; 6. Sub district Center; 7. Future extension



1. UHC (Health Building); 2. Male hostel; 3. Class III quarter; 4. Female hostel; 5. Class-I quarter; 6. Garage; 7. Future extension.

Figure 5.6 Site Plan, Raojan

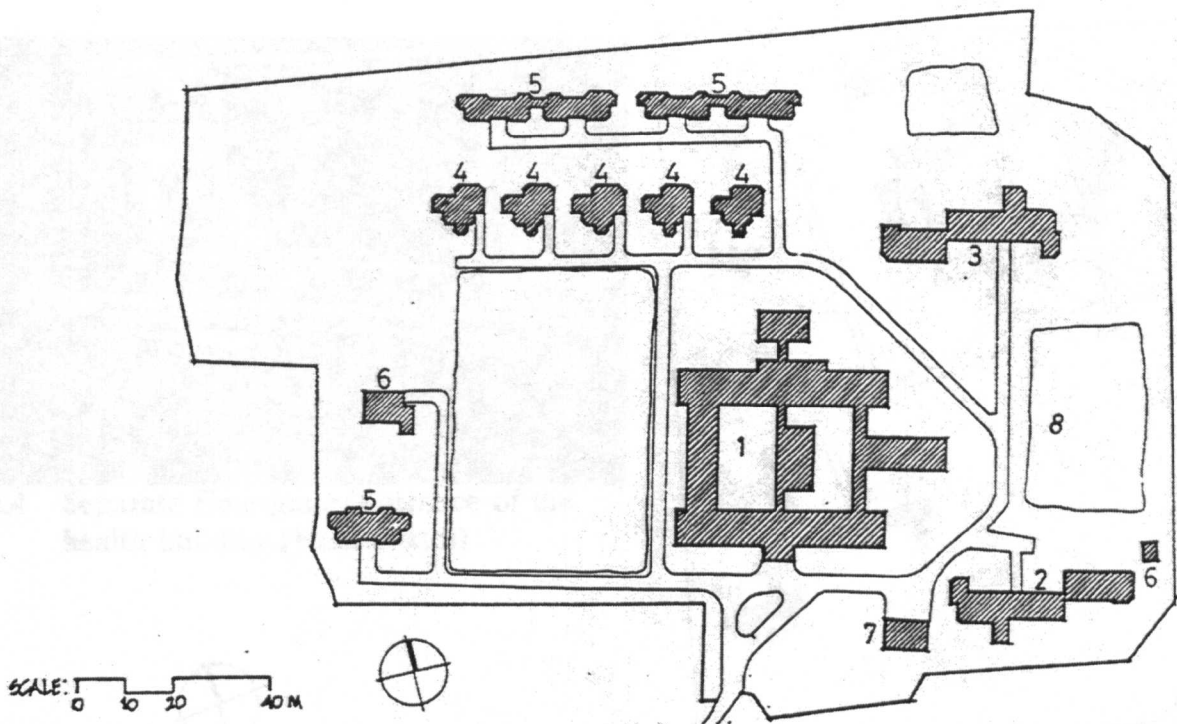
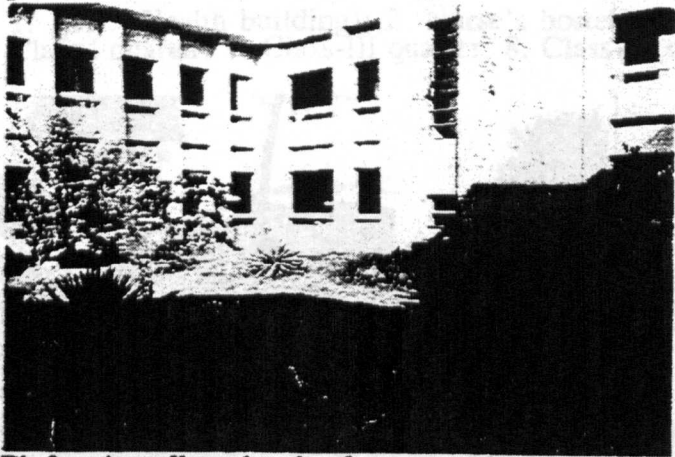


Figure 5.7 Site plan, Chattak

1. UHC (Health Building); 2. Male hostel; 3. Female hostel 4. Class-I quarter; 5. Class-III quarter; 6. Sub station; 7. Garage; 8. Pond.



Ph.3 A well maintained courtyard within the health building.(Bhaluka)

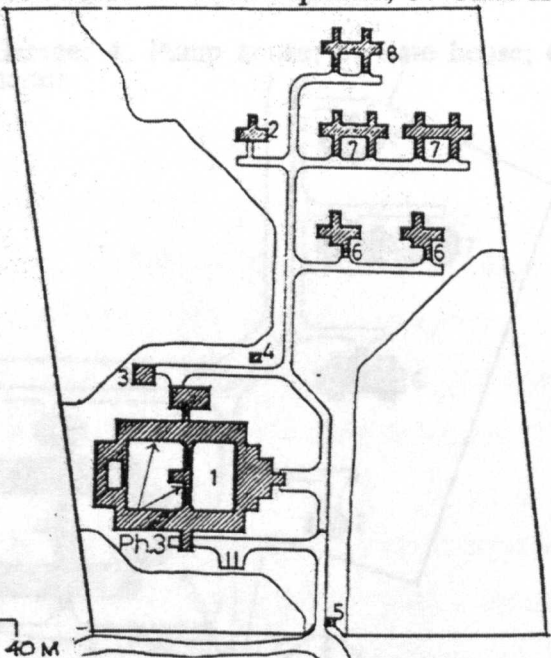


Figure 5.8 Site plan, Bhaluka.

1. UHC (Health Building); 2. Nurse's dormitory; 3. Garage; 4. Pump house; 5. Gate house; 6. Class-I quarter; 7. Class-III quarter; 8. Class-V quarter

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Ph.4 Separate Emergency entrance of the health building.(Ranisankail)



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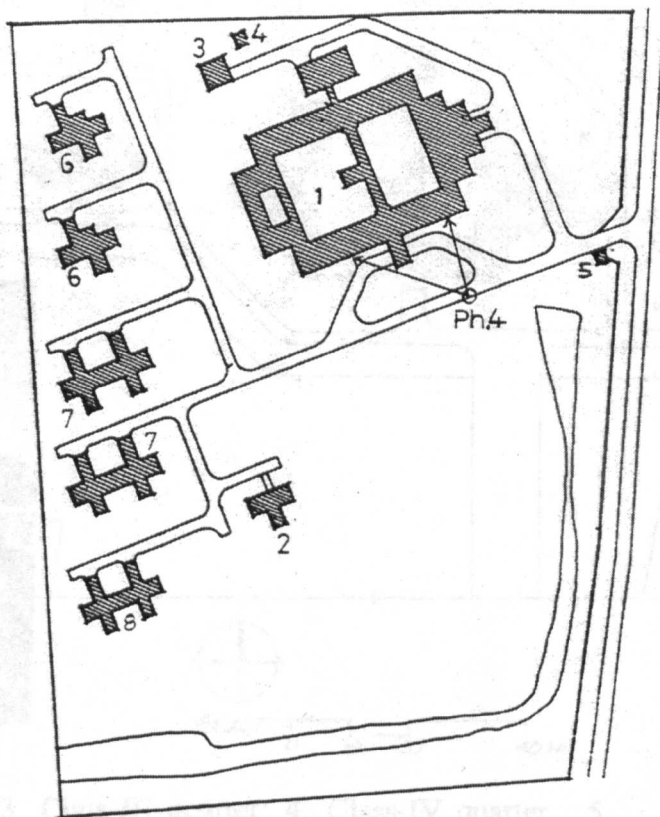
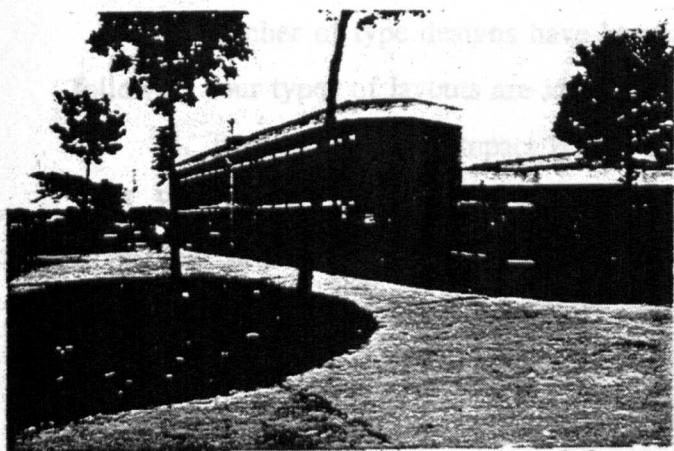


Figure 5.9 : Site plan, Ranisankail.

1. UHC (Health building); 2. Nurse's hostel; 3. Garage; 4. Pump house; 5. Gate house; 6. Class-I quarter; 7. Class-III quarter; 8. Class-IV quarter.



Ph.5 Separate Emergency entrance of the health building.(Shibpur)

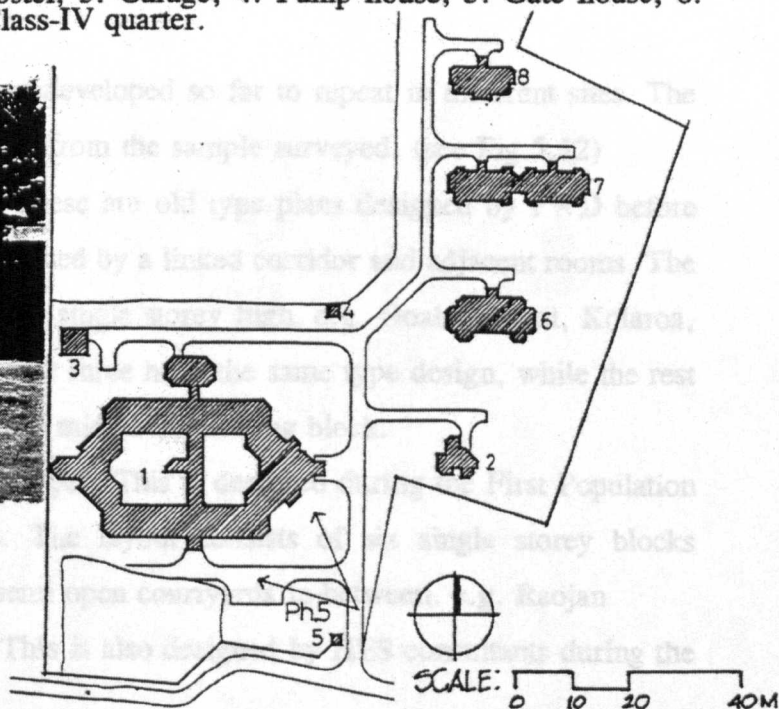


Figure 5.10: Site plan, Shibpur.

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Ph.6

Main entrance leading to out-door reception and clinics.(Mohammadpur)

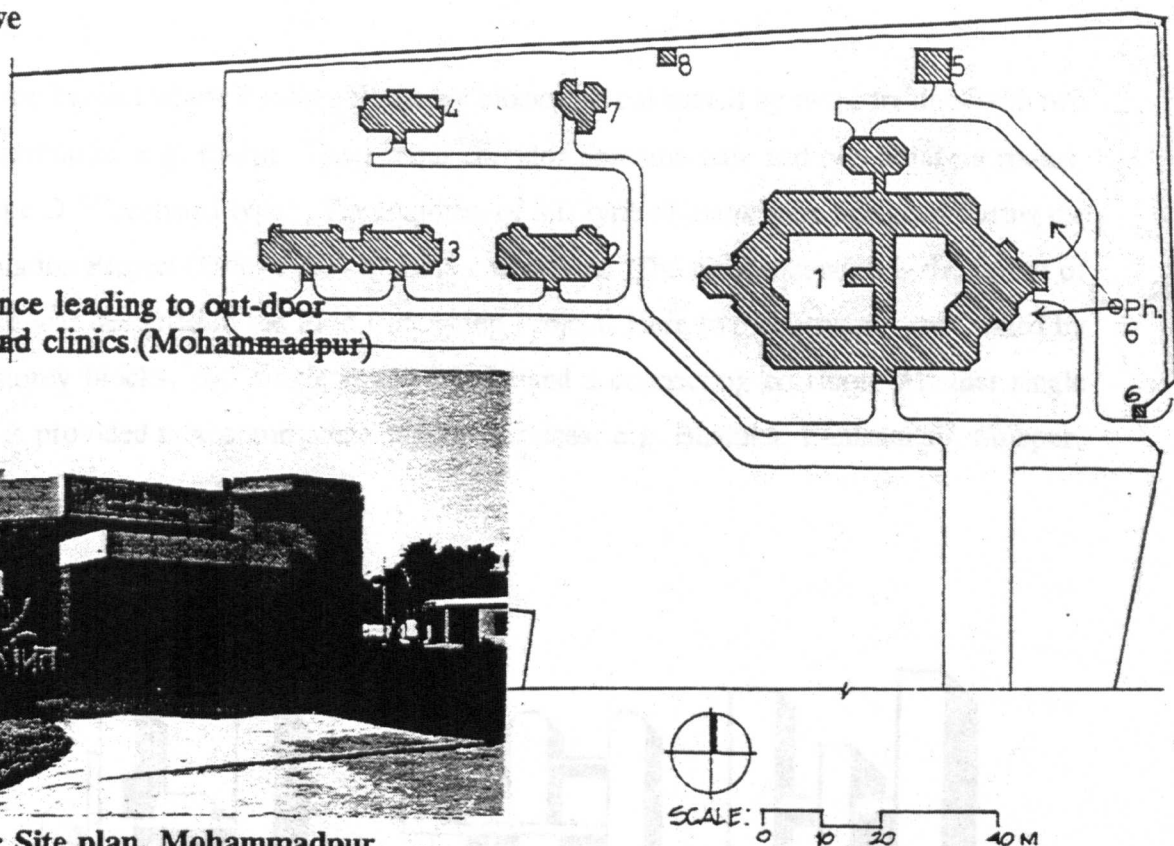
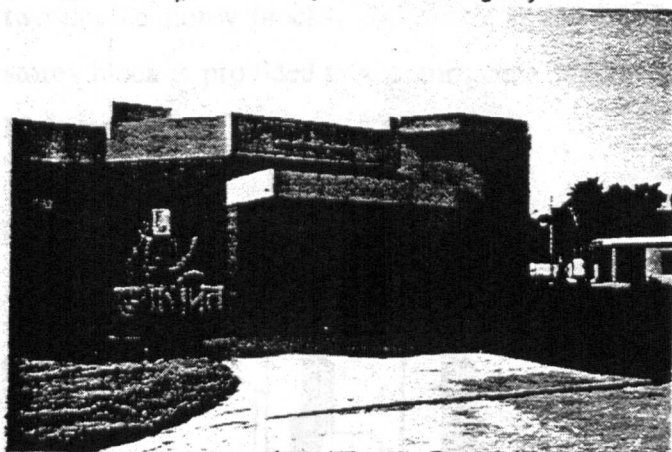


Figure 5.11: Site plan, Mohammadpur.

1. UHC (Health building); 2. Class-I quarter; 3. Class-III quarter; 4. Class-IV quarter. 5. Garage; 6. Gate house; 7. Nurse's hostel; 8. Pump house;

Building Layout:

A number of type designs have been developed so far to repeat in different sites. The following four types of layouts are identified from the sample surveyed. (see Fig.5.12)

1. Type A "linked compact type": These are old type plans designed by PWD before 1973. Here two rectangular blocks are connected by a linked corridor and adjacent rooms. The front block is two storied and the rear one is single storey high. e.g. Goalandaghat, Kolaroa, Ishwardi, Bakergonj and Begumgonj. The first three have the same type design, while the rest have variations, especially with respect to the middle connecting block.

2. Type B "Single storey spread out type": This is designed during the First Population Project (1973-1980) by HES consultants. The layout consists of six single storey blocks connected by corridors with a number of semi open courtyards in-between. e.g. Raojan

3. Type C "Semi courtyard type": This is also designed by HES consultants during the

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First Population Project where two double storey blocks are connected by two corridors with two semi open courtyards. e.g. Puthia. The central corridor contains stair and two adjacent rooms.

4. Type D "Courtyard type": The majority of this type of plans were designed during the Second Population Project (1980-1985) by HES consultants. The only exception is the layout of Chattak which was designed in the First Population Project. Here two courtyards are formed by two double storey blocks, two single storey blocks and a connecting corridor. Another single storey block is provided to accommodate support services. e.g. Bhaluka, Ranisankail, Shibpur, Mohammadpur.

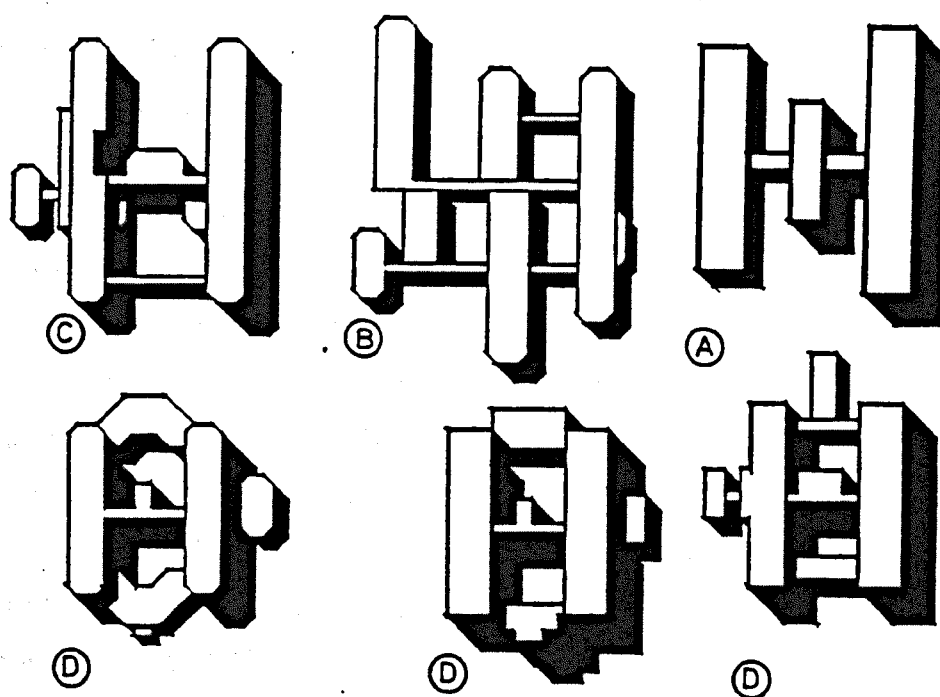


Fig. 5.12 Building type (UHC)

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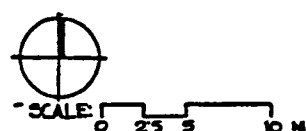
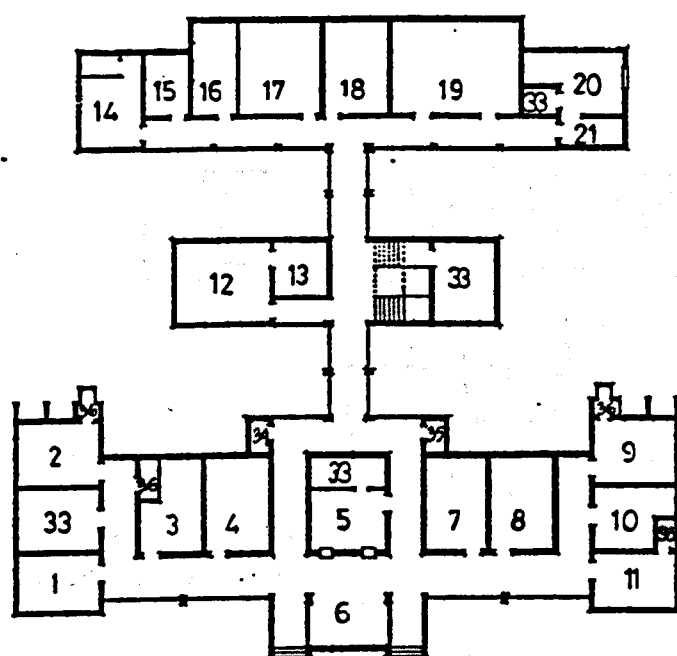
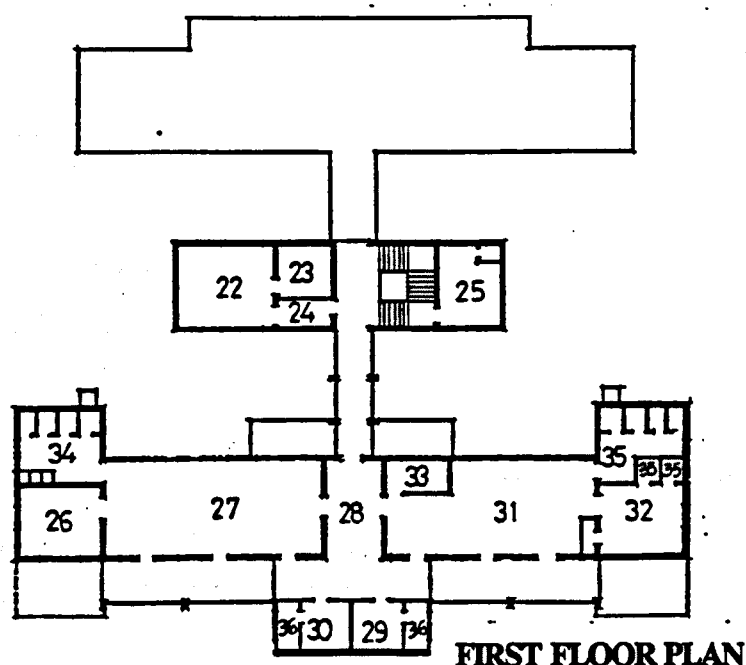
Type A "Linked compact type": The public spaces (e.g. clinic and diagnostic -treatment) of health and F.P. side along with support services are arranged on the ground floor. In general, the front block contains O.P. clinics, administrative facilities and dispensary in the ground and wards in the second floor. While the middle one with stair and other facilities and the rear block with F.P. clinics, Kitchen and so on. The location of Laboratory, O.T., X-Ray, EPI varied in different complexes. No hierarchy is maintained in the organisation of activity spaces e.g. public, semi-public, private and restricted areas. The emergency room has no separate entrance and is often placed within the O.P. areas, facing the main corridor. Kitchen is also placed beside the clinics. In Bakergonj and Begumgonj the O.T. is placed in between F.P. clinics.

There is no separate maternity ward. The delivery room is accessible from the female ward. This type of layout hampers privacy of female patients. Even in the out-patient areas, male and female patients have to share the same waiting area. On the other hand the location of the in-patient areas, being in the first floor, increased security and privacy.

Circulation is straight forward, reduced walking distance for some functionally related areas. Because of the use of open corridor, patients and visitors are free to move to all areas. Even O.T. in the UHCs are directly accessible and visible from the main corridor. Control of access to I.P. areas is not maintained by keeping public areas crossing the main vertical circulation. On the other hand with only one entrance used by out patients, in-patients, visitors, emergency patients and staff, the area becomes crowded in peak hours.

The layout has limited scope for horizontal expansion. The expansion has already taken place vertically. The use of different room size and shape often hinders changes in the use of spaces. Stores and toilets are scattered all over the places, which also hinders future possibility for changes. (see Fig.5.13 to 5.17)

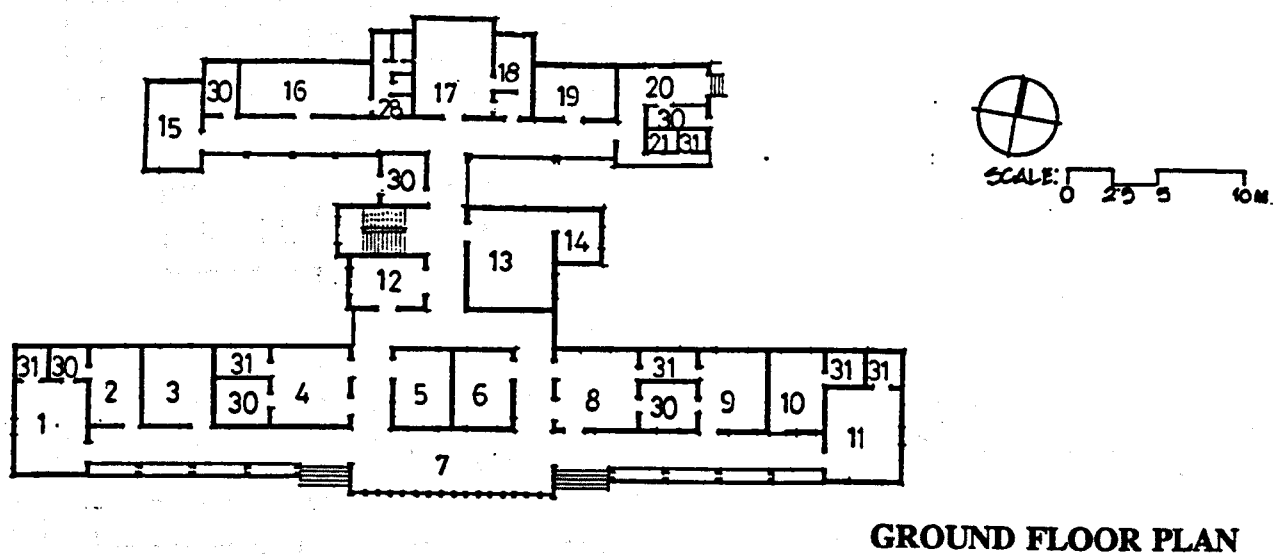
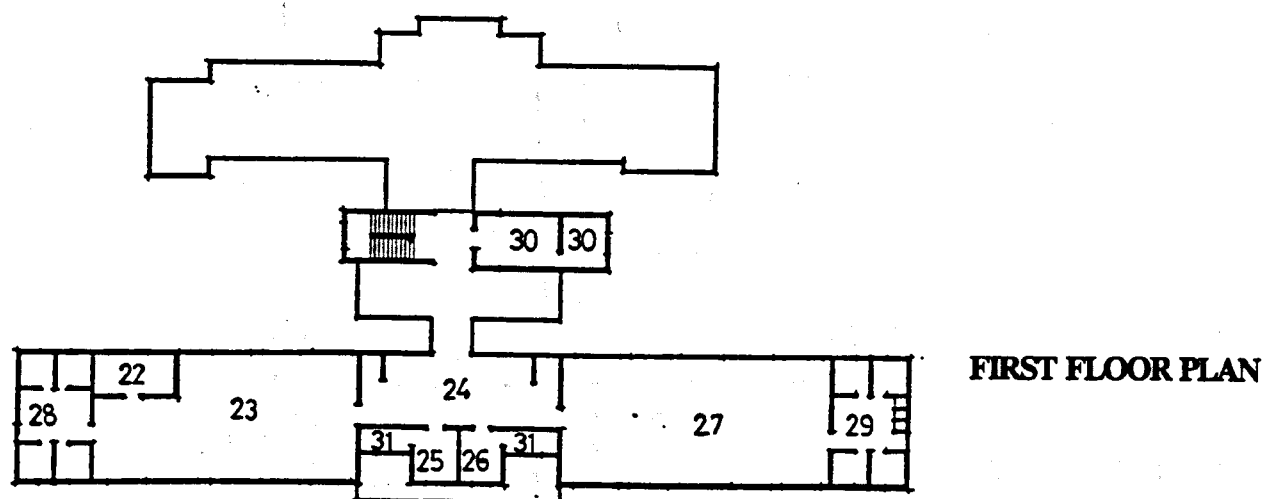
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1. Office (UHFPO); 2. Administrative Office; 3. Office (UFPO); 4. Office, F.P.; 5. Dispensary; 6. Waiting (M,F); 7, 8 and 9. O.P. Clinic (MO); 10. Dental Clinic; 11. Emergency/Treatment; 12. X-Ray; 13. Dark room; 14. F.P. clinic; 15. Store keeper(Health); 16. Store keeper (F.P.); 17. Laboratory; 18. EPI/Injection room; 19. Field staff Office (HI); 20. Kitchen; 21. Pantry; 22. O.T.; 23. Sterilisat.; 24. Scrub-up; 25. Inspection; 26. Male ward; 27. Male ward; 28. Waiting/lobby; 29. Doctor's room; 30. Nurse's room; 31. Female ward; 32. Labour room; 33. Store; 34. Patient's toilet (Male); 35. Patient's toi. (F); 36. Staff toi.

Figure 5.13 Floor Plan, Goalandaghat UHC.

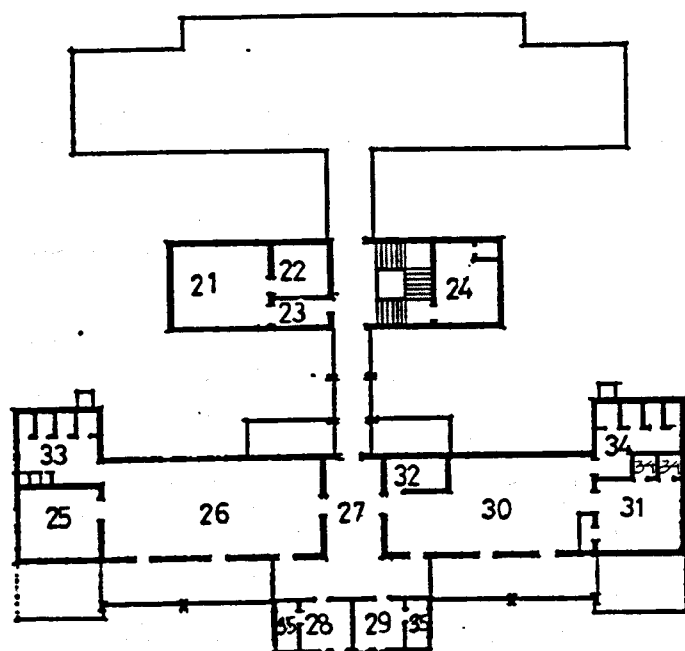
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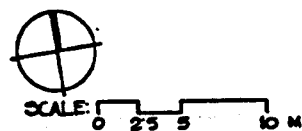
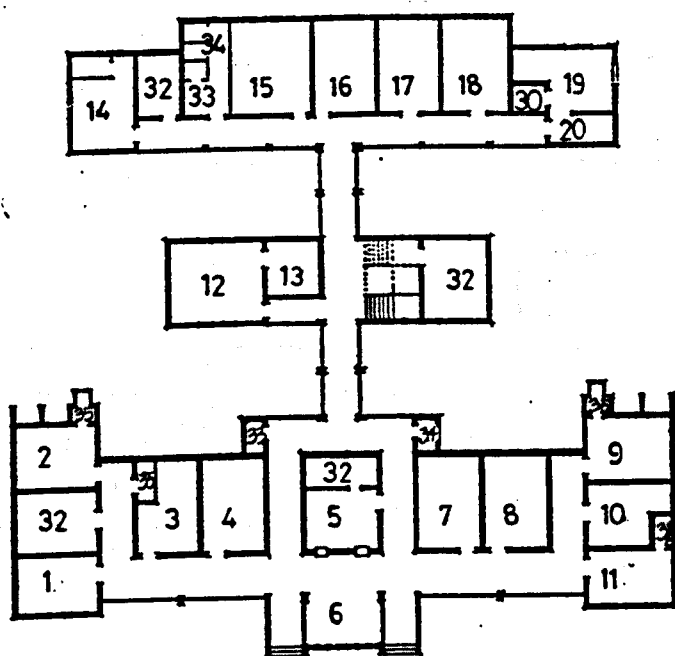
1. Office (UHFPO); 2. Administrative Office; 3. Office (UFPO); 4. RMO; 5. Emergency/Treatment; 6. Dispensary; 7. Waiting (M,F); 8, 9, 10 and 11. O.P. Clinic (MO); 12. EPI; 13. X-Ray conv. to training; 14. Dark Room conv. to store; 15. Laboratory; 16. F.P. clinic (FWV); 17. O.T.; 18. Sterilisation; 19. Clinic-MO(MCH); 20. Kitchen; 21. Wash; 22. Labour room; 23. Female ward; 24. Lobby; 25. Nurse's room; 26. Doctor's room; 27. Male ward; 28. Patient's toi. (F); 29. Patient's toilet (Male); 30. Store; 31. Staff toi.

Figure 5.14 Floor Plan, Bakergonj

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FIRST FLOOR PLAN

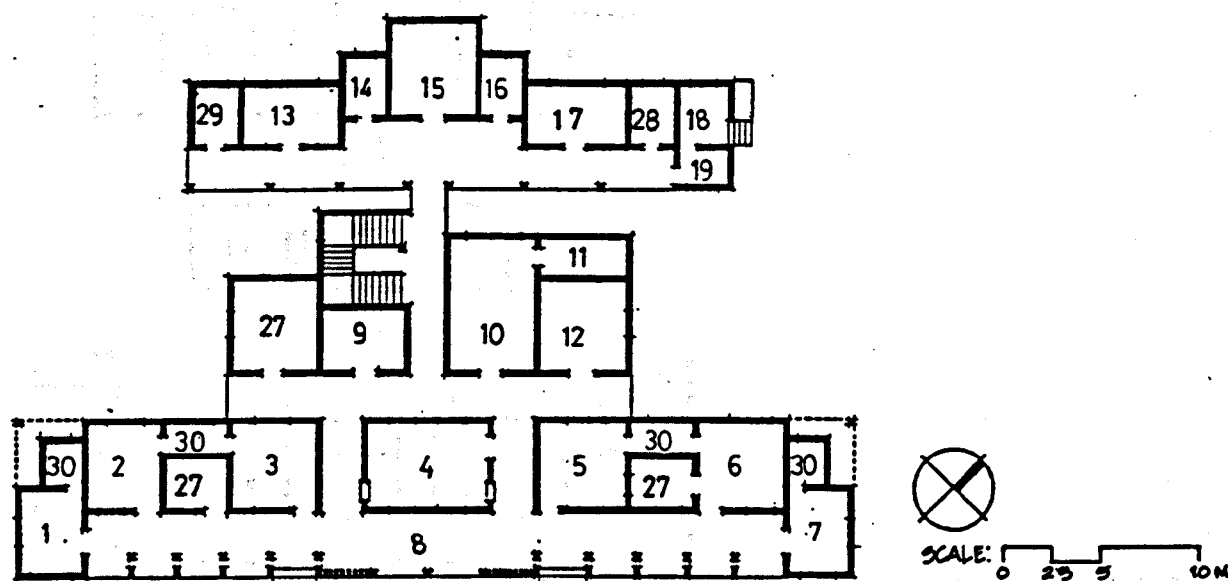
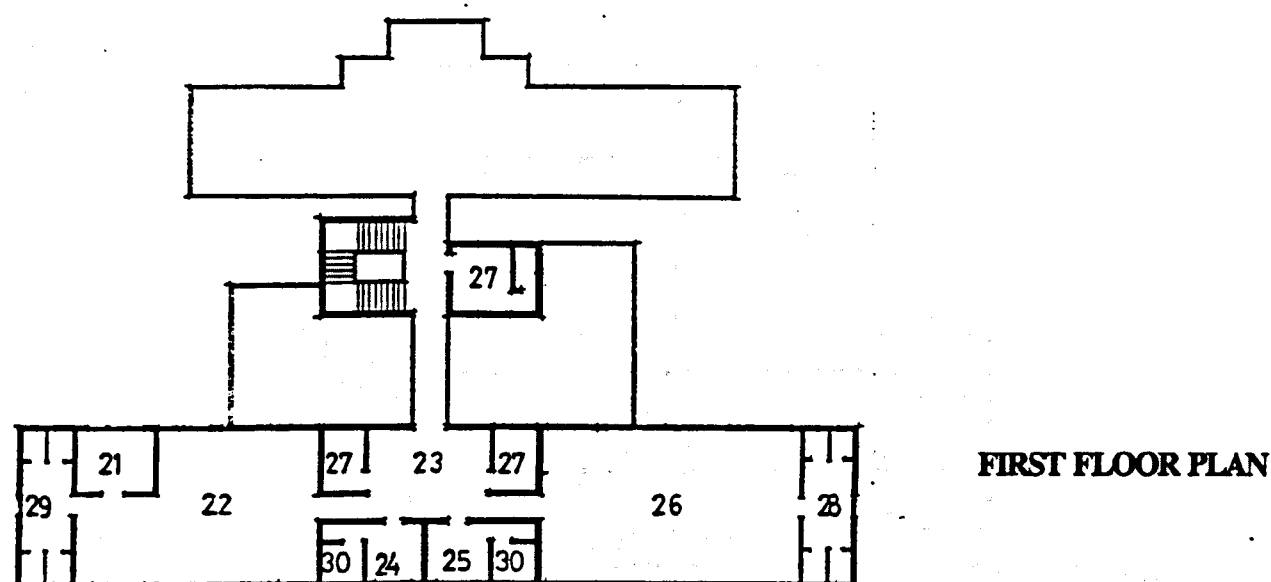


GROUND FLOOR PLAN

1. Office (UHFPO); 2. Administrative Office; 3. Office (UFPO); 4. SI; 5. Dispens.; 6. Waiting (M,F); 7. Laboratory; 8, 9 and 10. O.P. Clinic (MO); 11. Emergency/ Treatment; 12. X-Ray; 13. Dark Room; 14. F.P. clinic (FWV); 15. Clinic-MO(MCH); 16. EPI/ Injection; 17. HI; 18. Multipurpose hall; 19. Kitchen; 20. Pantry; 21. O.T.; 22. Sterilization; 23. Scrub-up; 24. Inspection; 25 and 26. Male ward; 27. Lobby; 28. Nurse's room; 29. Doctor's room; 30. Female ward; 31. Labour; 32. Store; 33. Patient's toilet (Male); 34. Patient's toi. (F); 35. Staff toi.

Figure 5.15 Floor plans, Kolaroa

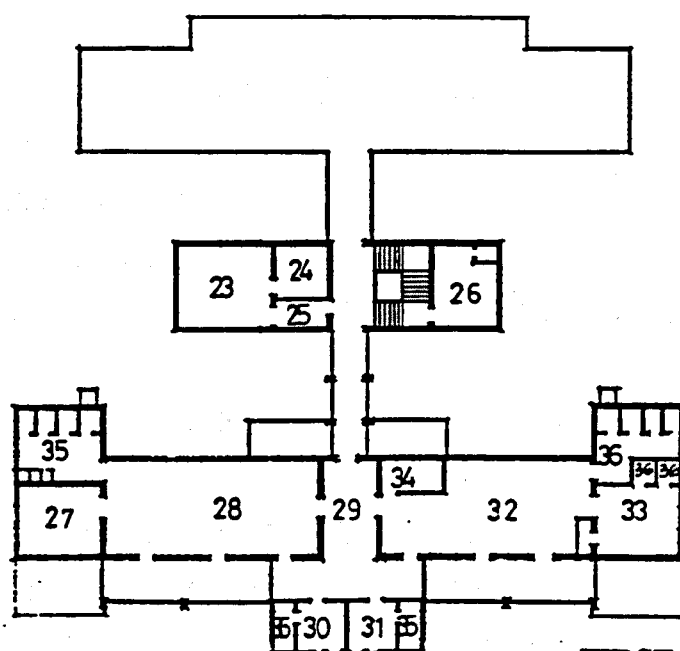
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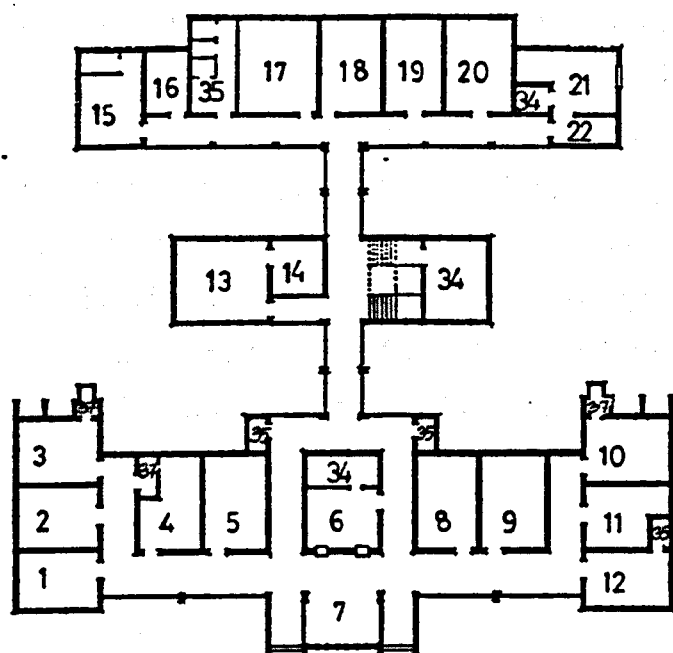
1. Office (UFPO); 2 and 3. O.P. Clinic (MO); 4. Dispensary; 5. Office (UFPO); 6. Administrative Office; 7. RMO; 8. Waiting (M,F); 9. Laboratory; 10. X-Ray; 11. Dark Room; 12. Emergency/ Treatment; 13. F.P. clinic (FWV); 14. EPI/ Injection; 15. O.T.; 16. Wash; 17. Clinic-MO(MCH); 18. Kitchen; 19. Pantry; 20. Wash; 21. Labour room; 22. Female ward; 23. Lobby; 24. Nurse's room; 25. Doctor's room; 26. Male ward; 27. Store; 28. Patient's toilet (Male); 29. Patient's toi. (F); 30. Staff toilet.

Figure 5.16 Floor Plan, Begumgonj

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FIRST FLOOR PLAN



SCALE: 0 2.5 5 10 M

GROUND FLOOR PLAN

1. Office (UHFPO); 2. Statistician; 3. Administrative Office; 4. F.P. Office; 5. S.I.; 6- Dispensary; 7. Waiting (M,F); 8, 9, 11 and 12. O.P. Clinic (MO); 10. FWV; 13. X-Ray; 14. Dark Room; 15. F.P. clinic (FWV); 16. Clinic-MO(MCH); 17. Laboratory; 18. Emergency/ Treatment; 19. Dental surgeon; 20. EPI and store; 21. Kitchen; 22. Pantry; 23. O.T.; 24. Sterilisation; 25. Scrub-up; 26. Inspection; 27. Male ward (Diarrhoea); 28. Male ward; 29. Lobby; 30. Nurse's room; 31. Doctor's room; 32. Female ward; 33. Delivery; 34. Store; 35. Patient's toi. (Male); 36. Patient's toi. (F); 37. Staff toilet.

Figure 5.17 Floor Plan, Ishwardi

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Type B "Single storey spread out type": Here all the activity spaces are organised in the ground floor. This type plan also lacks hierarchy of organising activity spaces. Thus administrative and F.P. areas are placed behind the ward areas, although with separate corridor. The male ward is located near O.T. and O.P. areas and the labour room in-between children and female general wards. The only advantage of labour room location is not to provide separate maternity ward.

Due to open corridor system, it is difficult to control movement of patients and visitors. This has also caused security problem for the health complex. It is difficult to control the movement of patients and visitors throughout the complex as public areas are taken right back of the building crossing private and restricted areas. The internal courtyards need protection to provide better security and privacy specially for indoor patients. Although two separate waiting areas were designed for male and female patients, but for location of pharmacy and the use of combined general out-patient clinics one is used by both.

Individual blocks are terminated by end walls causing problem of extending individual blocks independently, rather than building a complete new block. Single storey building has the advantage of requiring no vertical circulation to move patients. The disadvantage is the increased walking distance from one area to other, occupying larger ground area.

Single entrance is efficient for control purposes. But for emergency separate entrance is essential to avoid mix of general out-patient and seriously injured patients.

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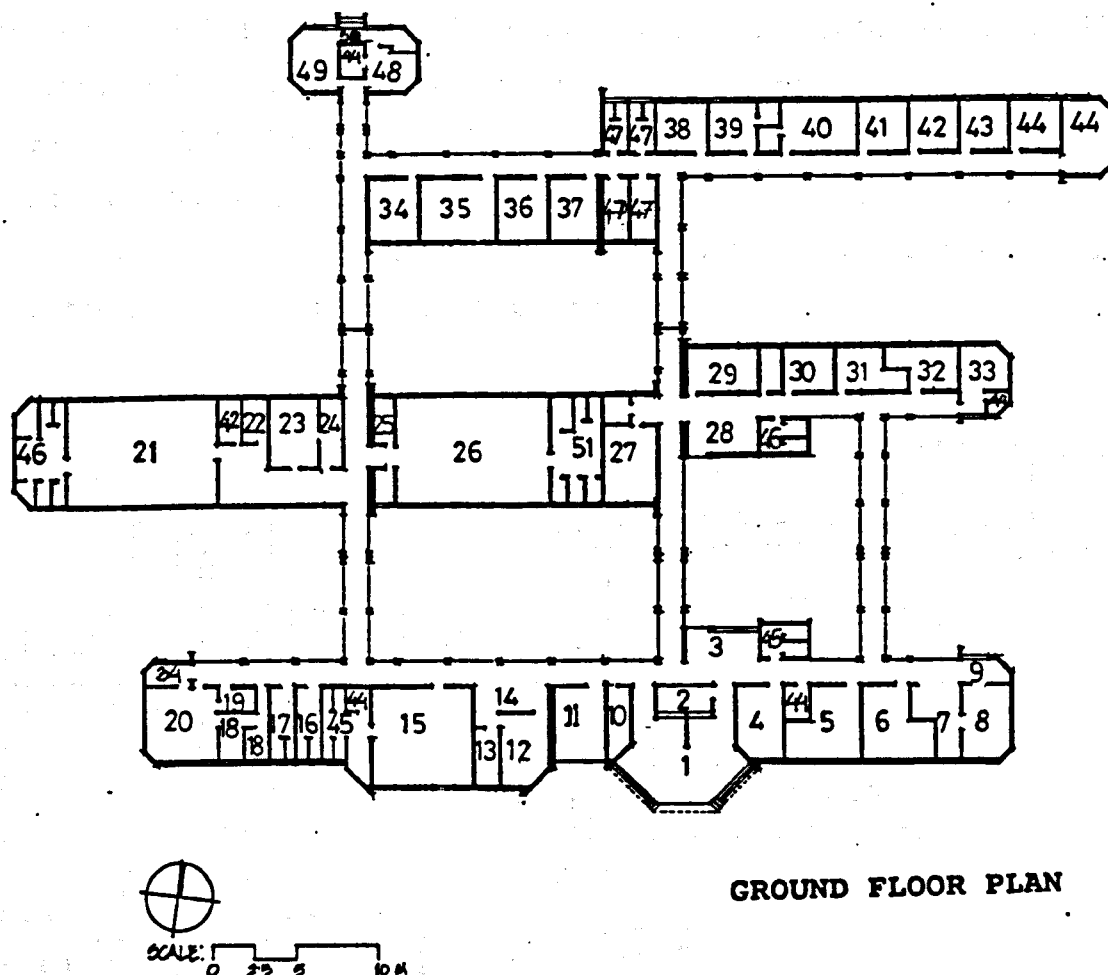
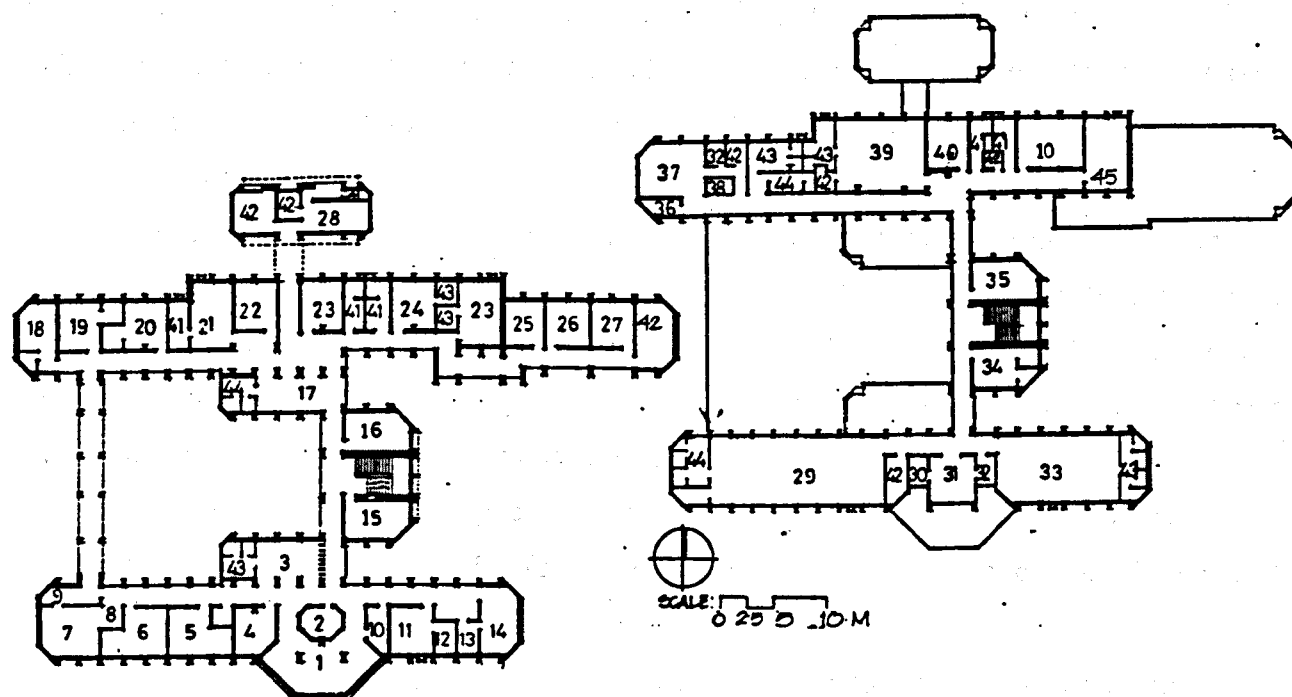


Figure 5.18 Floor Plan, Raojan

1. Reception; 2. Reception/ Registration 3 and 7. Waiting (male); 4, 5, 6 and 31. O.P. Clinic (MO); 8. Dispensary; 9 and . Waiting (female); 10. Emergency/ Treatment; 11. Dressing; 12. X-Ray; 13. Dark room; 14. Waiting; 15. Male ward 16. Change (male); 17. Change (female); 18. Sterilisation; 19. Scrub-up; 20. O.T.; 21. Female ward; 22. Sluice; 23. Labour room; 24. Sterilisation; 25. Nurse station; 26. Children ward; 27. Laboratory; 28. Waiting (Female); 29. F.P. Office; 30. Office (UFPO); 32. Clinic (FWV); 33. MO (MCH); 34. Field staff; 35. Training; 36. EPI; 37. EPI control room; 38. Office (UHFPO); 39. Administrative office; 40. Office; 41, 42 and 43. MO; 44. Store; 45. Toilet (male); 46. Toilet (female); 47. Staff toi. 48. Kitchen; 49. Bulk store; 50. Verandah.

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Type C "Semi courtyard": This type is similar to type D, where courtyards are open on one side. The out-patient areas including F.P. clinics, diagnostic and treatment, administrative offices and kitchen are located in the ground and wards, O.T., recovery, training, injection and delivery units in the first floor. Kitchen is provided in a separate block behind the second block. Although two waiting spaces are provided for male and female patients, only one is in use for the same reason as in Raojan. The lack of hierarchy in the disposition of functional areas caused scattered movement of patients and staff. Single centrally located staircase is found efficient for easy communication between functionally related areas. This layout also shows closed pattern in terms of future growth and expansion.(see Fig.5.19)



GROUND FLOOR PLAN

1. Reception; 2. Registration; 3. Waiting (M/F); 4, 5 and 6. O.P. Clinic (MO); 7. Dispensary; 8. Waiting (male); 9. Waiting (female); 10. Injection; 11. Emerg. /treat.; 12. Sterilisation /store; 13. Dark room; 14. X-Ray; 15. Laboratory; 16. Training staff (T.T.O.); 17. Waiting (converted to cycle stand); 18. Copper-T; 19. MO-MCH; 20. F.W.V. 21. F.P. office; 22. F.P. Officer; 23. Administrative office; 24. Office (UHFPO); 25. S.I.; 26. H.I.; 27. Cashier; 28. Kitchen; 29. Female ward; 30. sluice; 31. Labour room; 32. sterilisation; 33. Male ward; 34. Tutor's office; 35. RMO; 36. Scrub-up; 37. O.T.; 38. Sluice; 39. Post operative; 40. Tutor's office; 41. Staff toi. 42. Store; 43. Toilet (male); 44. Toilet (female); 45. Training.

FIRST FLOOR PLAN

1. Reception; 2. Registration; 3. Waiting (M/F); 4, 5 and 6. O.P. Clinic (MO); 7. Dispensary; 8. Waiting (male); 9. Waiting (female); 10. Injection; 11. Emerg. /treat.; 12. Sterilisation /store; 13. Dark room; 14. X-Ray; 15. Laboratory; 16. Training staff (T.T.O.); 17. Waiting (converted to cycle stand); 18. Copper-T; 19. MO-MCH; 20. F.W.V. 21. F.P. office; 22. F.P. Officer; 23. Administrative office; 24. Office (UHFPO); 25. S.I.; 26. H.I.; 27. Cashier; 28. Kitchen; 29. Female ward; 30. sluice; 31. Labour room; 32. sterilisation; 33. Male ward; 34. Tutor's office; 35. RMO; 36. Scrub-up; 37. O.T.; 38. Sluice; 39. Post operative; 40. Tutor's office; 41. Staff toi. 42. Store; 43. Toilet (male); 44. Toilet (female); 45. Training.

Figure 5.19 Floor Plans, Puthia

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Type D "Courtyard type": The type plan consists of 3 single storey blocks to accommodate out-patient entrance, reception- registration-waiting, dispensary, administrative offices and support services and two double storied blocks to accommodate the rest. It is a courtyard plan where two courtyards are surrounded by main corridors. All public-related functions (e.g. OPD, emergency, diagnostic treatment and administration) are located on the ground floor, while one of the blocks on the first floor is for inpatient wards and the other for O.T. and maternity department. In this way an attempt has been made to separate public space from semi-public, private and restricted zones. Two separate entrances are provided for out-patients and emergency patients and one service entrance for kitchen and bulk store.

The courtyard plan has the advantage of providing security and better environment. With planting and proper maintenance it could enhance working and living environment of both patients and staff. The stair is located centrally, clearly visible from all sides, to facilitate movement of people and supplies.

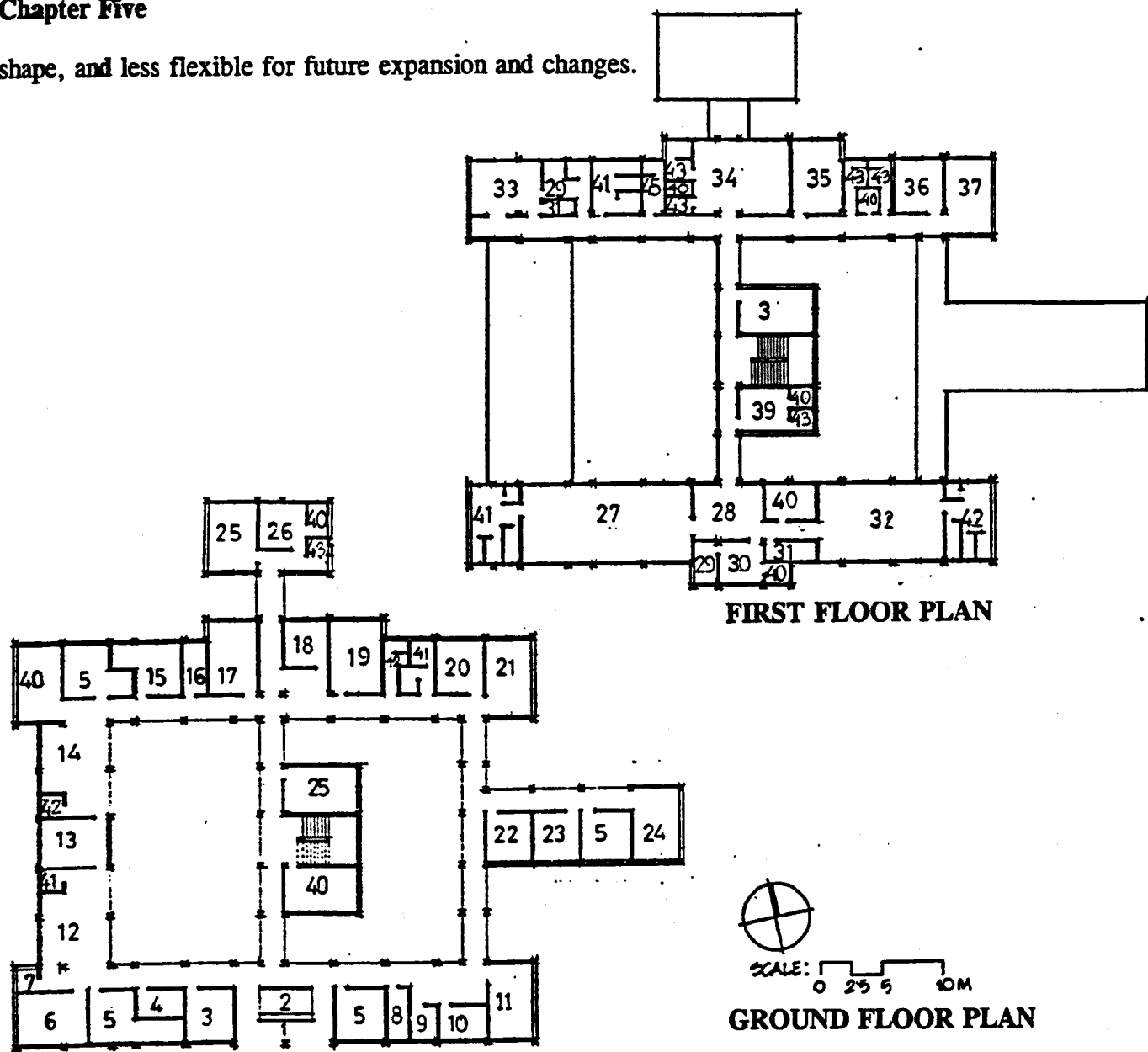
In the design care has been given to maintain privacy by providing separate male-female waiting areas with associated toilets and dispensing points. But in reality due to shortage of staff and working procedure only one is used by both sexes. The long walking distance between waiting and clinic areas compel the patients to wait in the main corridors. In IPD three separate wards are provided for male-female and maternity patients.

The disadvantage of this type of layout is that it is a complete form and corridors are blocked with functional areas. So for future extension it demands a completely separate structure. (see Fig.5.20 to 5.24)

Except Raojan all the UHCs have both single and two storey blocks with mainly in patient areas in the first floor. One staircase, often centrally located is provided for vertical circulation. The combined use of single and two storied approach not only facilitates saving of land area for future extension but also keeps, if properly organised, related areas close together maintaining hierarchy of spaces. The different types of layouts shows changes from linked-compact to courtyard type. Attempts have been made to achieve certain degree of functional relationship between activity areas compared to the old ones. But still complete in form and

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shape, and less flexible for future expansion and changes.



1. Reception; 2. Registration 3. RMO; 4. Leprosy clinic (MO); 5. O.P. Clinic (MO);
6. Emergency/ treatment; 7. Sterilisation; 8. Laboratory; 9. Office/store; 10. Dark room;
11. X-Ray; 12. Waiting (male); 13. Dispensary; 14. Waiting (female); 15. F.P. Office; 16. F.P. store; 17. Office (FPO); 18. MO (MCH); 19. F.P. clinic (FWV); 20. Office (UHFPO);
21. Administrative office; 22. S.I. 23. H.I.; 24. Injection room 25. Kitchen; 26. Bulk store;
27. Male ward; 28. Lobby; 29. Sterilisation; 30. Labour room; 31. Sluice; 32. Female ward;
33. O.T.; 34. M.A.'s training; 35. Maternity bed; 36. Duty room; 37. Store keeper;
38. Doctor's room; 39. Nurse's station; 40. Store; 41. Patient's toi. (Male); 42. Patient's toi. (F); 43. Staff toilet.

Figure 5.20 Floor Plans, Chattak.

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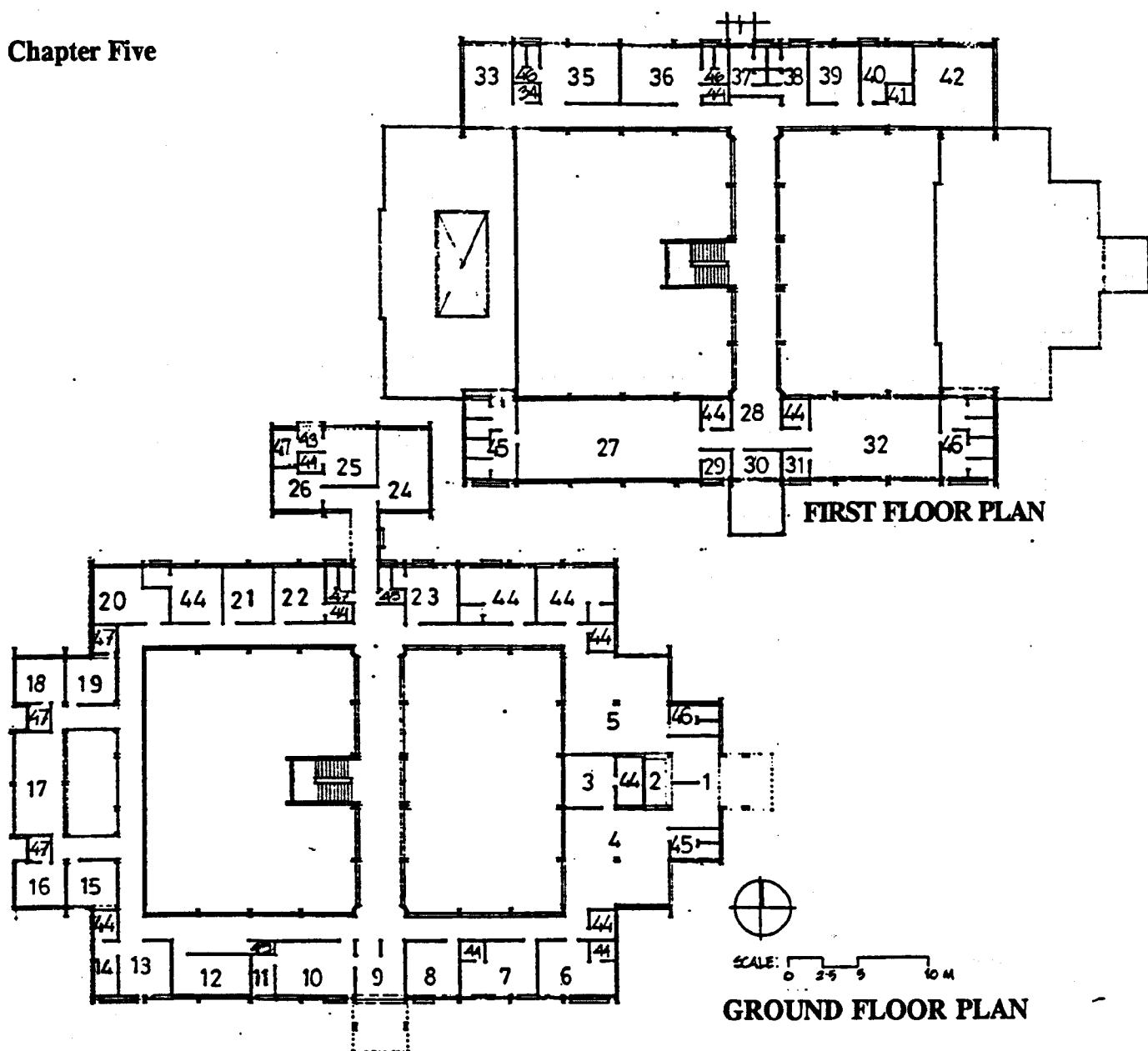
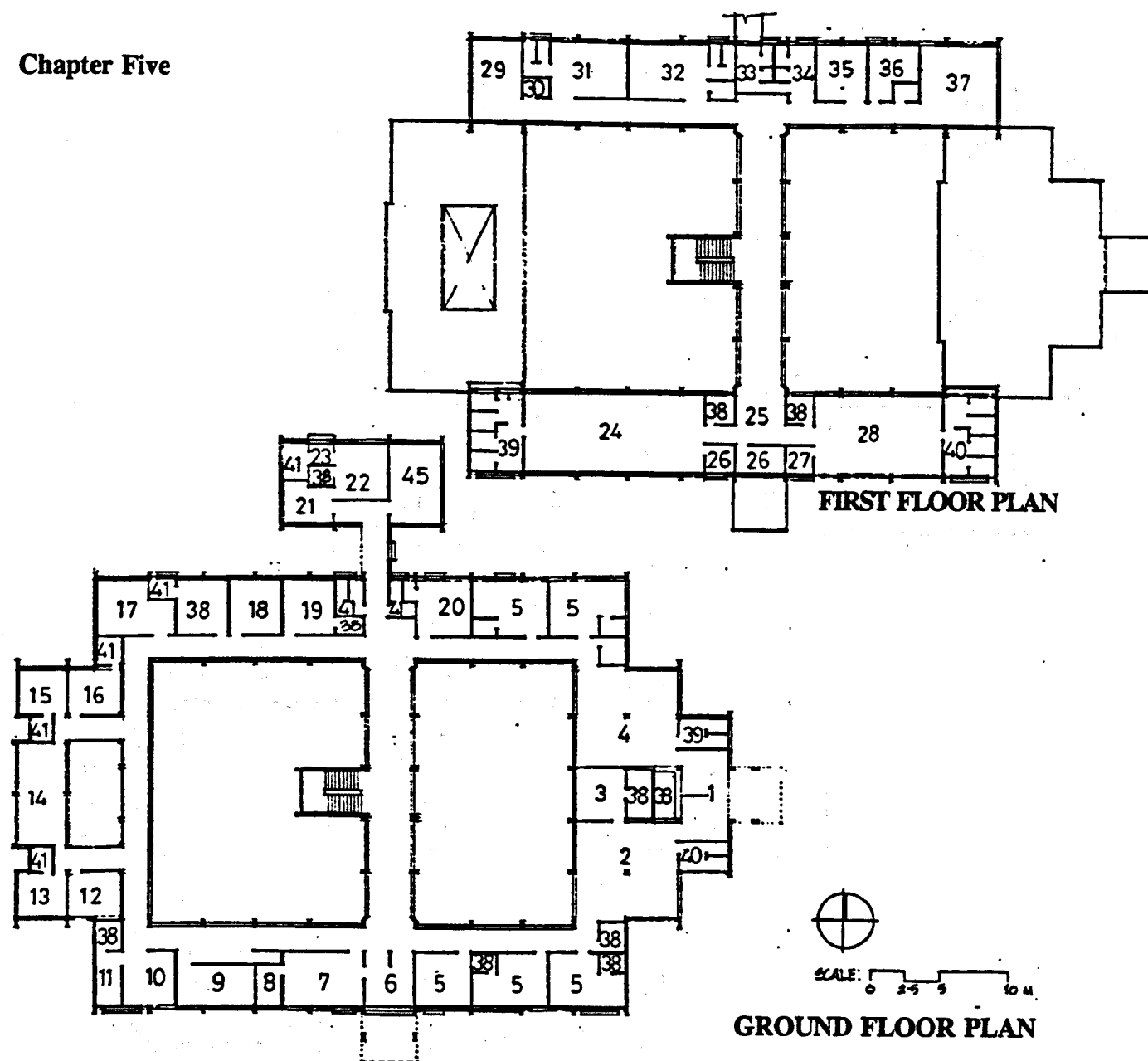


Figure 5.21 Floor plans, Bhaluka

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1. Reception; 2. Waiting (M/F); 3. Dispensary; 4. Multipurpose Hall; 5. O.P. Clinic (MO);
6. Reception (emergency); 7. Emergency/ Treatment; 8. Sterilisation; 9. Laboratory; 10. X-Ray;
11. Dark Rm; 12. H.I.; 13. S.I.; 14. Administrative Office; 15. Office (UHFPO); 16. RMO;
17. Office (UFPO); 18. F.P. Office; 19. F.P. clinic (FWV); 20. Asstt. FPO; 21. Pantry;
22. Kitchen; 23. Verandah; 24. Ward (Male); 25. Waiting; 26. Nurse's rm; 27. Doctor's rm;
28. Ward (Female); 29. Labour rm; 30. Sluice 31. Pre and Post Natal; 32. Injection rm;
33. Change (Female); 34. Change (Male); 35. Recovery; 36. Sterilisation; 37. O.T.; 38. Store;
39. Patient's toi. (Male); 40. Patient's toi. (F); 41. Staff toilet.

Figure 5.22 Floor plan, Ranisankail

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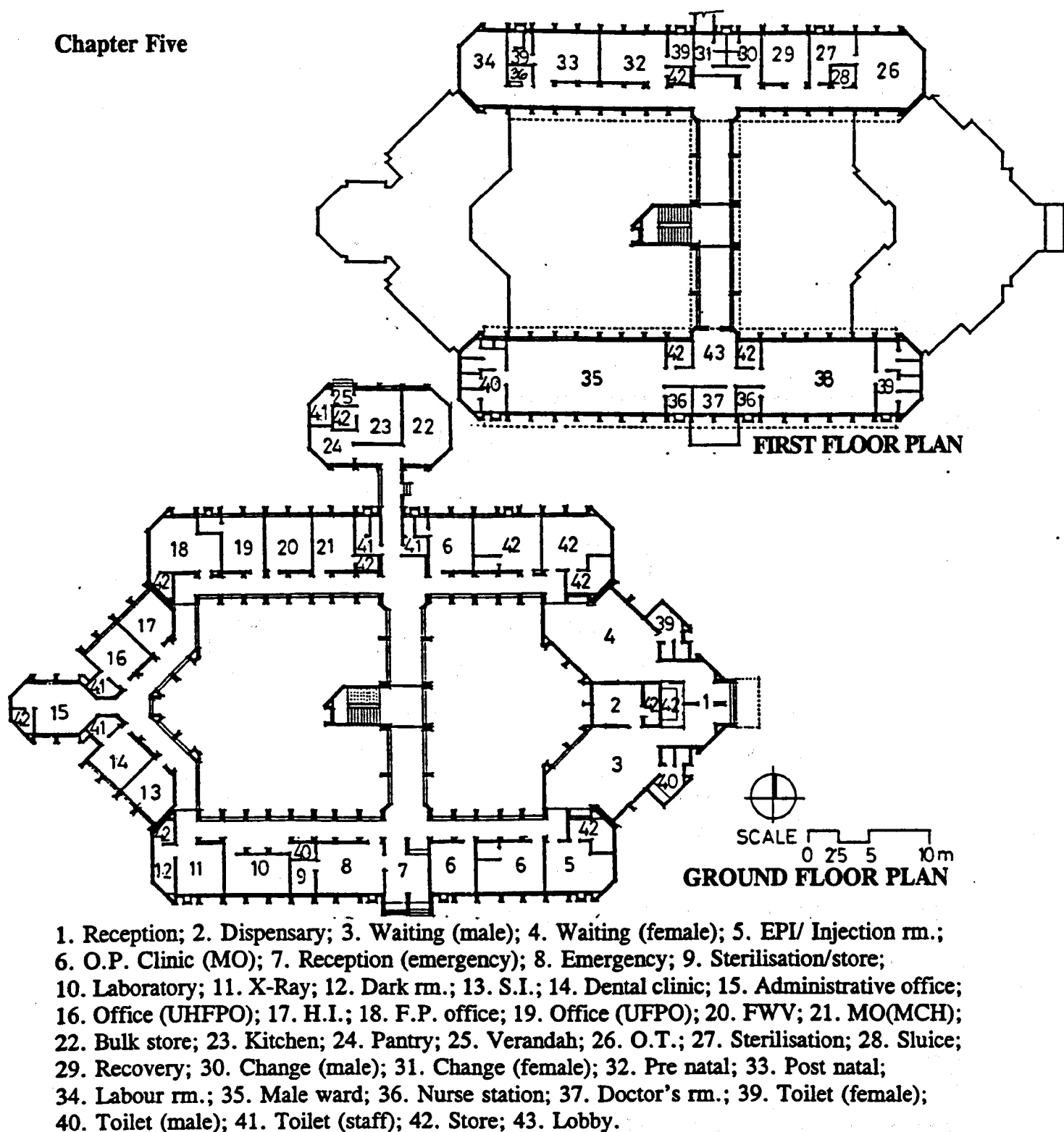
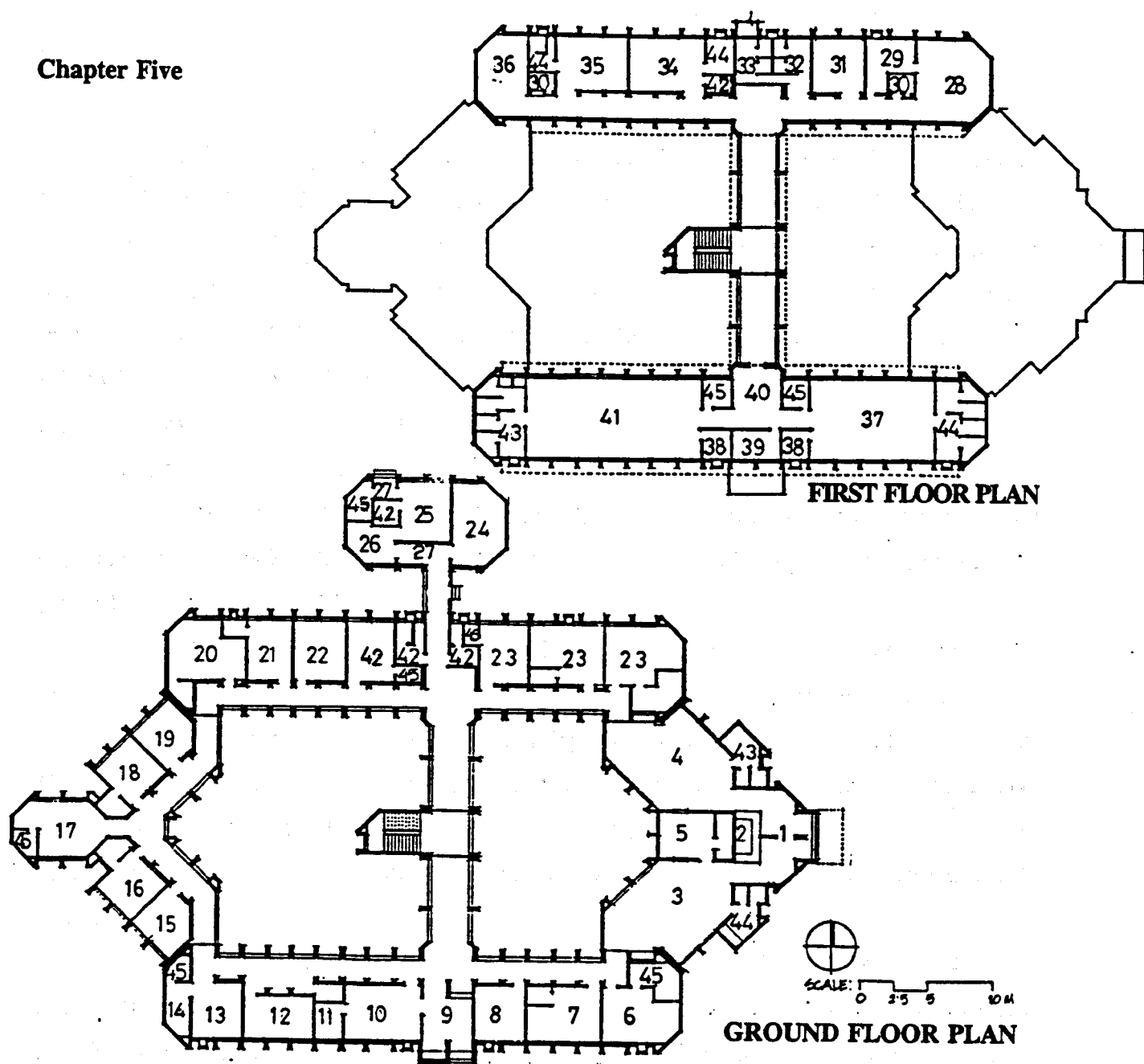


Figure 5.23 Floor Plans, Shibpur.

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1. Reception; 2. Registration; 3. Waiting (M/F); 4. Training; 5. Dispensary; 6. RMO; 7. Office (UHFPO); 8. Office; 9. Reception; 10. Emergency/ Treatment; 11. Sterilisation; 12. Laboratory; 13. X-Ray; 14. Dark rm; 15. EPI; 16. Cold rm; 17. Administrative office; 18. S.I.; 19. H.I.; 20. F.P. Office; 21. Office (UFPO); 22. MO(MCH); 23. O.P. clinic (MO); 24. Bulk store; 25. Kitchen; 26. Pantry; 27. Verandah; 28. O.T.; 29. Sterilisation; 30. sluice; 31. Recovery; 32. Change (male); 33. Change (female); 34. Pre natal; 35. Post natal; 36. Labour rm.; 37. Female ward; 38. Nurse station; 39. Doctor's rm; 40. Lobby; 41. Male ward; 42. Store; 43. Toilet (male); 44. Toilet (female); 45. Toilet (staff)

Figure 5.24: Floor Plans, Mohammadpur.

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5.1.2.2 Building Structure :

The old UHC structure, constructed during 60's and early 70's, are built with burnt clay bricks which are the chief constituents of load bearing walls along with ordinary Portland cement and sand mortar. Bricks are used traditionally in Bengal to construct permanent structures for many purposes because they are readily available, indigenous, cheap and easy to handle and transport. The new UHC structures, built during late 70's and 80's, are mostly constructed of brick with load bearing brick walls and columns. R.C.C beams and columns are used where ever necessary, mainly due to poor soil condition.

The main elements of super structure are made as follows:

Walls: Ten inches thick masonry brick wall, which takes the load of the structure with a mixture of ordinary Portland cement and sand mortar acting as binding material. Five or three inches brick walls are used as partition walls.

Roof: Roofs are constructed as flat R.C.C slabs consisting of mild steel rods, brick chips, Portland cement and sand. Where larger spans are needed like wards, beams are used.

Floor: Mostly neat cement finish over a layer of 1-1/2"(av.) thickness of patent stone. Use of terrazzo, laid in situ or in the form of tiles, is limited to places like toilet, stair, OT, X-ray and so on. Terrazzo floors are expensive initially, but in the long run more durable than patent stone finish and easy to maintain and clean. All materials although imported are available even in district level.

Finishes: Interior and exterior walls of old UHCs are finished with cement sand mortar and several coats of lime wash, locally known as white wash. Exterior walls of the new buildings are of exposed first class brick, finished by flushed pointing, with rich cement mixture. Skirting up to sill and five feet (approximately) height are used in O.T., wards, X-ray, delivery rooms with terrazzo finish.

For wall finish, in most cases, glazed tiles (white or coloured) are better than terrazzo, white wash or other paints which are susceptible to public handling, requiring frequent use of water, and cleaning to maintain hygiene. Glazed tiles are produced locally and prices are relatively on the low side.

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Though the white wash or lime wash conventionally used is very cheap comparing to distemper or plastic emulsion paint, it require painting every year, specially on walls. Cement bound paints, manufactured locally, are mostly used externally. A good quality distemper lasts approximately 2/3 years (not washable) and plastic emulsion paint lasts approximately 5 years (water washable). Oil paints are not available and enamel paints are used on doors and windows, but are not appropriate for walls as it easily peels off.

Doors and Windows: Door and window frames and shutters in old buildings are made of timber planks. Mostly locally available timbers are used which are not properly treated and seasoned. Timber surfaces are finished with several coats of enamel paints. Metal bars are provided in the windows for protection against theft.

In new buildings, flat mild steel grill and m/s sections are used for window frames. All windows are glazed and frosted glass is used where the question of privacy arose. The door jams are also made of m/s angle. M/S flat bars are widely used for window frames. The practice began about 2/3 decades ago, before that use of timber was conventional. But as timber and labour both became gradually more expensive and lack of good quality timber paved the way for other industrial materials mainly m/s flat bars and aluminiums. The problem of timber presently is expense and when they are unseasoned, untreated and immature, timber windows twist very easily. They are difficult to maintain, not only painting and polishing but in some case due to rough handling the wood breaks away quite easily.

Water proofing in top ceiling: Lime terracing, a traditional mixture of brick dust and 1/2" grade brick chips with lime, is used over the top floor ceiling. Though a very tedious process, it is so far the most effective method of water proofing.

The overall construction materials and methods are quite conventional and widely in use all over Bangladesh. No special materials suitable for these type of building have been taken into consideration.

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5.1.2.3 Surface Area:

The survey of UHCs shows that the areas allotted for the same bed size of UHCs varied significantly. The building plans were collected from the consulting firms (HES) and the Department of Architecture (PWD) and the areas were calculated from these plans. The plans were also taken to the individual sites to note existing space use and if any growth and change had occurred from the original plans.

The total areas varied from 1027 to 1732 square meters. In general the new type plans have more area compared to the old type plans except for Raojan, which is the only single storied building among the sample UHCs. This is mainly due to the increased bed number and facilities provided for new services e.g. MCH, F.P., EPI and so on. (see Table 5-4)

	HIALUKA		SIHBPUR		GOALANDAGHAT		KANISANKAIL		ISWARDI		BAKERGONJ	
Functional Areas	Area	% of total	Area	% of total	Area	% of total	Area	% of total	Area	% of total	Area	% of total
Out-patient areas	270.00	17.62	358.17	26.69	128.61	10.73	292.34	19.16	216.03	18.01	165.24	13.79
Common areas	114.86	7.60	196.09	14.64	26.67	2.23	114.87	7.60	49.76	4.14	26.95	2.25
Health side	73.97	4.81	69.98	5.22	60.03	5.01	117.47	7.65	95.17	7.94	96.93	8.09
F.P. side	81.97	5.33	92.10	6.87	41.91	3.49	60.22	3.91	71.10	5.93	41.36	3.45
Emergency	55.00	3.58	57.06	4.26	16.35	1.36	40.52	2.64	19.80	1.65	15.33	1.28
Laboratory	17.47	1.14	19.05	1.42	26.48	2.21	17.47	1.14	41.54	3.46	13.01	1.08
X-Ray	23.98	1.55	24.44	1.82	37.92	3.16	23.97	1.55	37.92	3.16	37.92	3.16
EPI	35.22	2.30	24.44	1.83	19.79	1.65			20.82	1.74	13.01	1.09
Administration	74.26	11.12	80.48	6.00	143.22	11.95	72.12	4.90	94.33	7.87	146.00	12.10
Operating Theatre	86.71	5.64	88.85	6.63	57.81	4.82	86.71	5.64	57.81	4.82	55.94	4.66
Delivery	74.35	4.85	75.19	5.61	19.42	1.62	74.35	4.85	19.42	1.62	19.42	1.62
In-patient areas	169.14	11.04	210.00	15.68	281.59	23.49	169.14	11.04	221.56	18.49	281.60	23.48
Kitchen	54.63	3.56	31.78	2.37	25.84	2.16	54.63	3.56	25.84	2.16	25.84	2.15
Circulation	327.46	21.37	300.69	22.44	168.95	14.09	327.46	21.37	169.00	14.11	227.73	18.99
Total	1532.25		1339.87		1198.32		1532.25		1198.0		1198.86	
Total area per bed	49.42		43.22		38.65		49.4		38.64		38.67	
I.P. area per bed	5.45		6.77		9.08		5.45		7.14		9.08	
O.P. area/100 visit	108.00		132.65		54.49		111.15		102.38		80.20	

	MOHAMMADPUR		KOLAROA		BEGUMGONJ		CHATAK		PUTHIA		RAOJAN	
Functional Areas	Area	% of total	Area	% of total	Area	% of total	Area	% of total	Area	% of total	Area	% of total
Out-patient areas	367.08	27.39	158.73	13.24	165.61	16.03	388.23	20.31	316.65	14.95	171.93	16.73
Common areas	196.00	14.63	49.72	4.15	33.64	3.26	170.91	9.47	72.21	4.38	58.55	4.79
Health side	52.32	3.91	37.92	3.16	62.45	6.04	82.06	4.74	61.34	3.72	54.46	5.30
F.P. side	84.94	6.34	71.09	5.93	69.52	6.73	105.58	6.10	113.10	6.85	48.33	4.70
Field staff	33.82	2.52	20.07	1.67			29.74	1.72	70.07	4.25	10.59	1.03
Emergency	57.06	4.26	16.36	1.36	20.82	2.01	28.16	1.63	29.83	1.81	18.87	1.84
Laboratory	19.05	1.42	22.12	1.84	13.01	1.26	7.81	0.45	20.35	1.23	16.26	1.58
X-Ray	24.44	1.82	37.92	3.16	36.24	3.51	39.13	2.26	26.67	1.62	17.01	1.65
EPI	21.56	1.61	19.79	1.65			21.93	1.27	2.25	1.47	20.63	2.01
Administration	82.25	6.14	72.03	6.01	65.24	6.31	97.30	5.62	115.05	6.97	61.71	6.01
Operating Theatre	88.85	6.63	43.85	3.60	33.83	3.27	6.47	4.02	116.54	7.06	44.05	4.29
Delivery	75.19	5.61	23.32	1.94	12.08	1.17	21.93	1.27	26.39	1.60	17.29	1.68
In-patient areas	456.60	34.07	247.17	20.63	271.84	26.30	306.78	17.71	251.86	15.26	209.20	20.36
Kitchen	31.78	2.37	25.84	2.16	13.75	1.33	48.51	2.80	35.06	2.10	21.84	2.13
Circulation	300.67	22.44	169.00	14.10	232.86	22.53	354.35	20.46				
Teaching							90.24	5.21	61.71	3.73	26.58	2.59
Total	1339.87		1198.32		1027.32		1732.03		1650.46		1027.32	
Total area per bed	43.22		38.65		33.12		55.87		53.24		33.13	
I.P. area per bed	14.72		7.97		8.76		9.89		8.12		6.74	
O.P. area/100 visit	343.06		128.08		81.58		206.50		58.53		36.73	

Table 5-4 Surface Area
Primary Health Care Facilities in Bangladesh

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The surface area analysis shows a wide variation in the space allocated for different functions. For example the surface areas allotted for out-patient and in-patient areas varies from 129 sq.m. (Goalandaghat) to 388 sq.m. (Chattak) and 169 (Bhaluka) to 456sq.m. (Mohammadpur) respectively. Circulation areas varied from 14% to 22%. The analysis indicates an absence of any surface area guidelines. (see Table 5-5)

There are also wide variations in the room shapes and sizes of similar functional areas e.g. consultation/ examination rooms, wards, operating theatres, X-ray rooms, laboratory and others.

Name of the UHC AND District	C/E: min. max.	Ward area/ bed (fem.)	Opera- ting Theat. (O.T.)	X-Ray	Labora- tory	Emerg- ency
A. DHAKA DIV.						
1. Bhaluka, Mymensing	12.26 22.30	5.00	20.72	15.89	15.03	22.30
2. Shibpur, Narsingdi	14.00 22.58	5.54	32.99	14.86	17.37	22.58
3. Goalandaghat, Rajbari	17.84 20.07	5.15	26.76	26.76	26.44	16.35
B. KHULNA DIVISION						
1. Bakergonj, Barisal	14.00 23.00	6.92	24.90	26.76	16.07	14.96
2. Mohammadpur, Magura	15.42 27.41	6.10	33.00	14.86	17.37	22.58
3. Kolaroa, Satkhira	17.84 26.48	5.15	26.76	26.76	20.07	17.84
C. CHITTAGONG DIV.						
1. Begumgonj, Noakahli	13.01 18.21	7.18	20.81	28.43	13.01	20.81
2. Raujan, Chittagong	7.10 15.51	4.60	18.86	12.16	13.65	12.82
3. Chattak, Sunamgonj	9.57 22.86	5.62	26.78	23.79	7.83	24.81
D. RAJSHAHI DIV.						
1. Puthia, Rajshahi	15.61 26.02	7.57	23.42	21.09	20.35	16.44
2. Ranisankail, Thakurgaon	14.86 22.30	5.52	20.72	14.03	15.89	22.30
3. Iswardi, Pabna	9.59 20.07	4.72	26.76	26.76	26.48	19.79

Table: 5-5 Room size and shape

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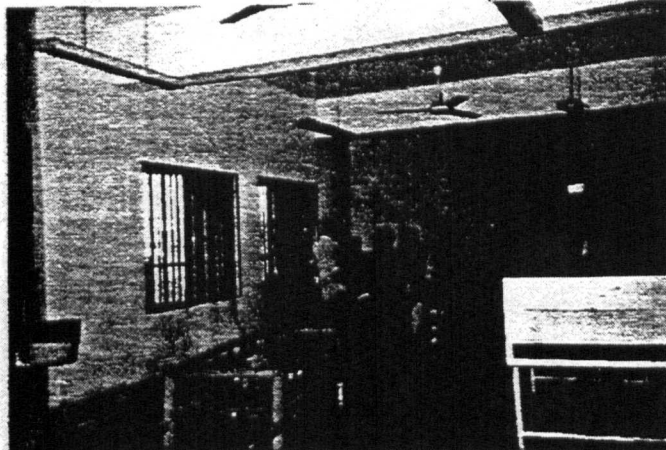
5.1.2.4 Growth and Change:

The old UHCs have undergone both growth/ expansion and changes in the functional use of spaces provided in the original design, while in the new types only changes in use have taken place. The reasons for growth and changes in old health complexes are mainly due to the changes in policies and programmes to include new services, functions, manpower and to increase bed numbers. Thus the 10 bed Rural Health Centres (1965) are expanded to 25 bed Thana Health Complex (1973) and subsequently to 31 bed UHC (1976). Along with the bed numbers new services like EPI, MCH, PHC and F.P. services are also accommodated within the expanded premises.

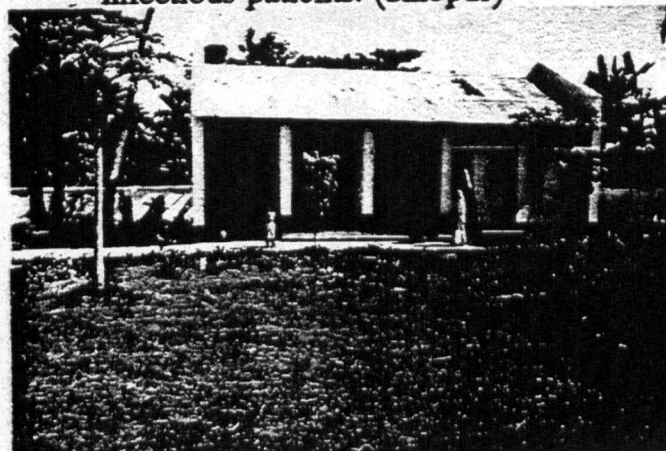
The expansion in old hospitals mainly took place vertically. Here the front single storey block has been expanded to double storey to accommodate mainly inpatient facilities e.g. wards, nurses room, doctors room, delivery room and so on. The rear block previously used for inpatients is changed for the use of F.P., MCH and other diagnostic and treatment facilities. No major expansion has taken place in outdoor services. The outdoor clinics designed for four doctors are now allocated for 9 doctors. Thus single doctors clinic has been changed for the use of two doctors. The majority of the old complexes are facing problems in providing accommodation for added doctors, EPI clinics, training facilities, health education class, domiciliary workers office, 6 maternity beds and so on. The UHFPOs of old complexes outlined the shortage of spaces as one of the main causes for poor service delivery. In Bakergonj one outside staff quarter has been converted to accommodate EPI/ Injection room, MCH and PHC related health education class and also to register patients.

The new health complexes are designed after 1976 as a 31 bed UHC. As yet they have not undergone any expansion or growth. But changes in the use of space has taken place. One of the important changes is to accommodate infectious diseased patients. In Bhaluka one of the waiting rooms and in Shibpur the postnatal room has been converted for this purpose. The following table 5-6 shows the changes in the use of spaces:

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Ph.7 Waiting area converted to ward for infectious patients. (Shibpur)



Ph.8 Staff Qrt. converted to EPI and Health edu. class.(Bakergonj)

Type of unit	Intended use	Present use
UHC:		
NEW:		
1. Waiting		a. Teaching and training b. Diarrhoea ward c. parking motorcycle
2. Clinics		a. Office b. Store d. Immunisation
3. Office		a. Clinics
4. Pantry		a. fire-wood storage b. staff accommodation c. storage
5. Maternity ward		a. ward for infectious disease patients b.
6. Recovery room		a. store
7. Ward lobby		a. food distribution space
8. Registration		a. Store
OLD:		
1. Staff Quarter		a. Health Education Class b. Immunisation c. Field worker's office
2. Ward		a. Family Planning Clinic b. Laboratory c. Store
3. O.T.		a. Emergency b. EPI
4. Clinic		a. Office
5. Office		a. Clinic
6. X-ray		a. Teaching and training
7. Store		a. Laboratory
8. Dispensary		a. Emergency
9. Waiting		a. Clinic

Table 5-6: Changes in the use of spaces

5.1.2.5 Environment:

Light and Ventilation: The majority of the rooms in new UHCs have adequate light and ventilation because of single depth room with windows on opposite walls. In some places number and areas of windows seemed to be more than required e.g. out-patient clinics, X-ray,

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O.T. In X-ray room, the large windows are later changed to small windows or are blocked by placing cupboard in-front or black curtain. The clinic windows facing main circulation areas hamper privacy. This problem is also common for the old buildings. In ward areas because of bed placement directly facing the windows on opposite walls and lack of adequate overhang or verandah, bed ridden patients suffer from glare. To solve both the problems of privacy and heat gain from solar radiation, curtains are used up to a certain height.

The building blocks are mostly oriented with their long axis in the east-west direction which is essential for adequate light and ventilation in a warm-humid country like Bangladesh. Ceiling fans provided in individual rooms also add to the natural ventilation.

Noise: Disturbance from external sources of noise is comparatively low in these complexes, as majority of the sites are away from major vehicular roads and the buildings within the sites have sufficient set back. Noise level is high in the out-patient areas during clinic hours and in the wards when a large number of visitors arrive. Scattered location of out-patient areas within the complex, absence of proper visitors waiting space and operational deficiencies often generate such problems.

5.1.3 The Out-patient areas:

Out-patient services:

The out-patient department provides both preventive and curative services for general out-patients through the following clinics:

1. General out-patient clinics (medicine, surgery, gynaecology)
2. MCH including under 5
3. Family Planning
4. Dental

For specialised treatment patients are referred to a District Hospital, T.B. clinic, Leprosy Clinic or other facilities. 17% of the sample health complexes have leprosy clinics while 42% have dental clinics. Promotive health care is hardly provided from any of these health complexes

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except from a few F.P and MCH clinics. Preventive health services are provided mainly through EPI clinics.

Staff:

The staff of the complex is divided into two distinct groups: the health care staff and the family planning (F.P.) staff. The health care staff consists of Medical Officers (MO), a Dentist/Dental surgeon, and pharmacists, the FP staff consists of MO(MCH), Family Planning Officer, Family Welfare Visitor. The majority of the MOs are male and their experience ranges from 2 to 5 years and a few with more experience. It was observed that although 5 to 9 doctors were appointed, not more than two doctors in health side attended out patients at a time. This fact is also observed in a study by Planning Commission (58), where the reasons identified for not joining are that most of them do not want to leave their previous job in urban areas leaving urban amenities. The out-patient doctors have to perform emergency duties by rotation, usually two days per week and one night per month. In the UHCs the number of pharmacists, who attend the dispensary, varies from 1 to 3. Other than some simple mixtures the majority of drugs and medicines come from the District Reserve Store (DRS) . Clerk or receptionist usually registers patients at the reception and issues tickets.

Workload:

The out-patient clinic remains open from 8 am to 2 pm, six days a week. The majority of patients attend the clinics between 10am and 1pm. The opening time was found to vary from centre to centre due to patients attendance and existing administration. As there is no appointment system, patients can attend clinics directly for the first and subsequent visits according to their convenient time. Due to poor communication system and non availability of transportation the majority of them arrived late. The day labourers and cultivators usually come during their lunch time. The following table: 5.7 shows the average number of out-patient attendance along with number of clinical rooms and appointed doctors:

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Name of UHC	Average number of out-patient attendance							No.of appoint. doctors	No. of C/E rooms.
	Day	Year	Male	Female	Child	Maternity	Total (per month)		
Bhaluka	250	72072	2652	1768	1586	AN18 PN13	6006	5	7
Shibpur	270	78000	2600	2340	1560		6500	6	6
Goalandaghat	236	68220	2333	2408	943		5685	7	5
Bakergonj	206	59400	2349	1419	1182		4950	6	6
Mohammadpur	107	30924	1141	809	596		2577	6	5
Kolaroa	124	35880	1345	987	658		2990	5	5
Begumgonj	203	58320	2435	1322	1103		4860	6	4
Raojan	468	135024	5190	4247	1814		11252	8	9
Chattak	188	54108	1059	1633	1817		4509	6	7
Puthia	541	156000	7212	3824	1964	13000	8	6	
Ranisankail	263	75624	2830	200	1467	AN47 PN10	6302	7	7
Iswardi	211	75960	1551	2179	2543		6330	9	8

Table 5-7 : Out-patient attendance

The table shows a wide variation in the number of attendance. Daily average out-patients is 255, ranging from a minimum of 107 in Mohammadpur to a maximum of 541 in Puthia. The proportion of male, female and children are 42%, 33% and 25% respectively.

Again no relation can be deduced between the number of Consultation/ Examination (C/E) rooms, doctors appointed and patients' attendances in different UHCs. Thus with same number of C/E rooms Goalandaghat deals with nearly double the number of daily out-patient attendance compared to Kolaroa. While in Bakergonj and Begumgonj with similar patient attendance and appointed doctors, the physical provision is different, six and four clinics respectively. Some relation need to be established between physical provision, throughput and staffing.

From observation during the survey it was found that a large number of patients, often 10 to 20 waiting at a time, are seen by the doctors. On an average one doctor attends 100 patients in a day. In which case they could hardly spend more than one to two minutes per patient. Such a volume of work puts them under pressure impairing the quality of services.

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Activities and operational procedures:

Sequence of activities:

- patient arrives at the UHC self or along with child/ relatives, majority on foot or private/ public transport
- patient enters UHC waiting space/ reception
- receptionist/ clerk issues ticket where serial number and room number of doctor is given
- receptionist registers serial number, patients name, age, sex and issues ticket
- patient is directed to specific room by clerk/ receptionist/ peon
- patient enters into the doctors room and waits for his/ her turn along with 10 to 20 patients within the room around the doctor's table
or when there are less patients and a peon is available, they wait outside the door in the corridor to be called by the peon one by one.
- doctor asks about problems/ illness while patients remains standing and writes down prescription
- majority of the patients are not physically examined
- serial number of the patient, name, age, treatment given and quantity of drugs given are recorded in a registration book by the doctor himself or by an assistant.
- prescription is given to patient
- If patient is asked to give sample to the lab or for X-ray, a request form is given.
- patient goes to the lab for test or comes on a fixed day with the sample
- patient goes to the X-ray room with doctors instruction/ request form
- patient goes to the dispensary for free medicine
- patient goes home

If patient is referred for admission, patient goes to emergency for admission.

The majority of the Outdoor patients visit UHCs for free medicine and treatment. The patients who are able to purchase medicine from outside usually come to the doctors in the afternoon as private patients. The following photographs are showing sequences of activities in

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out-patient areas.



1. Entrance to out-patient areas, Bakergonj. 2. Reception and Registration, Shibpur 3. Waiting in the corridor, Bhaluka. 4. waiting inside the out-patient clinic, Bhaluka. 5. F.P. clinic, 6. Dispensary near exit, Bakergonj.

Ph.9 Activities in out-patient areas

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Physical facilities:

Reception and registration:

Patients are registered here and a ticket is given stating the room number of the MO and a serial number. Here no attempt is made to keep individual patients' record. Only name, sex and serial number is recorded. In new type designs, a purpose made registration area is provided with a waiting space in front separated by a 2'-6" wall and grill divider. In old type no such space is allocated for registration. One table and a chair is placed either in the waiting area or in a separate building (e.g. Bakergonj).

Waiting:

Separate waiting areas were provided for male and female out-patients in the new type plans. But these are not being used as intended for the following reasons:

1. In Bhaluka it was converted to a ward for diarrhoea disease patients, in Ranisankail and Shibpur to a training/ multipurpose hall room. In Raojan one waiting area was used for keeping motor cycles of staff.

2. Due to the lack of adequate staff, patients were not allowed to wait in two different spaces for the easy delivery of services e.g. registration and dispensing from one area.

In the old type plans waiting areas for male and female patients were provided side by side. Again, as there was no patient call system and the rooms of the MO's were away from the waiting area, all the patients directly entered the MO's room or waited in front of the room crowded in the corridor. Waiting areas facing the dispensary and /registration were used mainly for queuing for medicine or registration. Waiting in the corridor caused inconvenience to the movement of people and as well for female patients it hampered privacy. Absence of any appointment system had created the problem of an indefinite waiting period. The majority of the waiting areas has no benches for waiting patients, neither the area is used for health education or any other purposes.

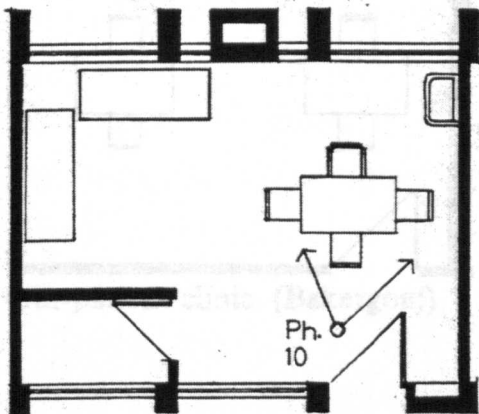
Clinics:

The majority of the clinics used by one doctor, were found to be large for actual activities performed. Around 36% of the clinics are designed with separate examination area and

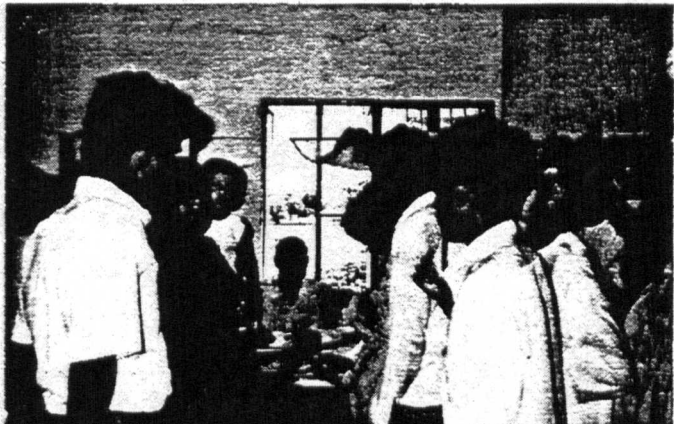
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store/toilet which are rarely used as intended and are the reasons for increased floor area. But those which were shared by two doctors were found to be inadequate and lacked audio-visual privacy for patients. The activities performed within the clinics are consultation, writing prescription and registration or keeping records. The doctors were found not to use examination couch for physical examination. In most of the places there is no provision for physical examination, and if there is any provision, it is hardly used. During consultation patients remain standing. In general the clinics have 1-2 tables, 4-6 chairs, with or without any examination couch. The new UHCs have hand wash basin with wall fixed mirror and rack. Only a few clinics were found to have height and weight machine.

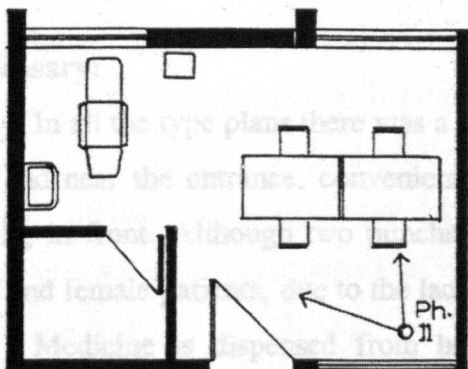
The figures (5.25) show the comparative size and use of different clinics along with furniture arrangement:



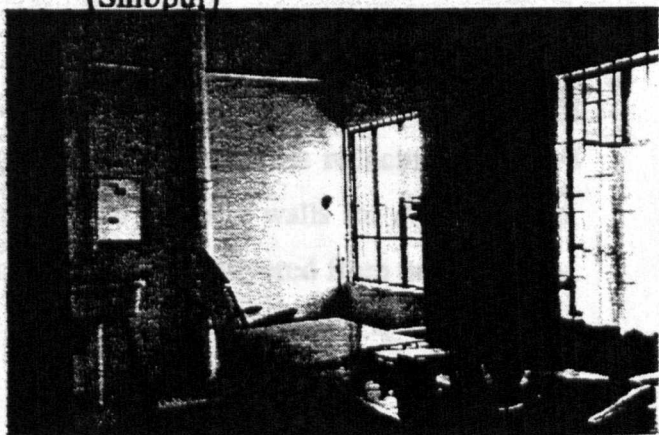
Out-patient clinic (Shibpur)



Ph.10 A large number of patients waiting within the clinic during consultation. (Shibpur)

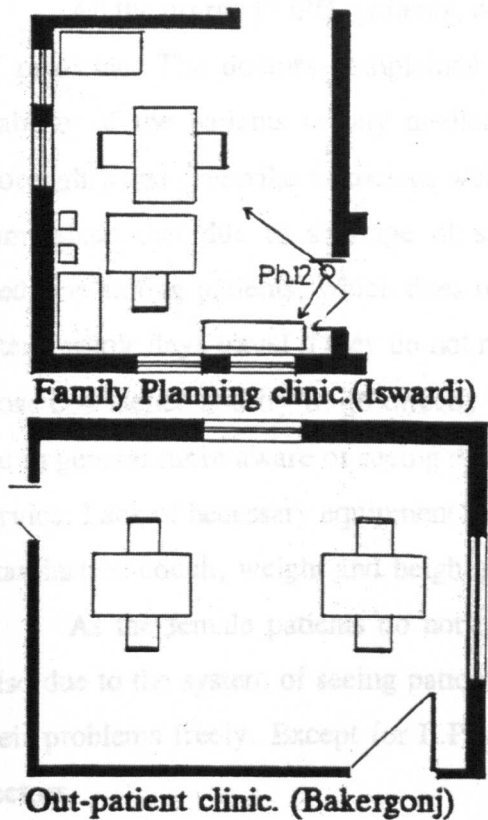


Dental and out-patient clinic.(Bhaluka)



Ph.11 Dental clinic shared with general out-patient clinic.(Bhaluka)

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Ph.12 Female patients waiting inside a F.P. clinic during consultation.(Iswardi)

Figure 5.25 : Out-patient Clinics

Dispensary:

In all the type plans there was a defined space for dispensary, usually facing the waiting area and near the entrance, convenient for leaving the complex and thus reducing the crowd waiting in front. Although two punches were given on two opposite walls for dispensing for male and female patients, due to the lack of staff, medicines were delivered from one side only.

Medicine is dispensed from here free of charge. The prescription is received and medicine is handed over by the pharmacist .

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Comments and problems identified:

All the users of OPD (patients, doctors, pharmacist) complained regarding acute shortage of medicine. The doctors complained that due to a shortage of medicine and knowing the inability of the patients to buy medicine from outside, they feel reluctant to examine them thoroughly and prescribe medicines which are not available in the dispensary. The pharmacists complained that due to shortage of supply they sometimes divide the requisite amount of medicine among patients, which does not serve any purpose at all. Patients are dissatisfied as after a whole days travel if they do not receive any medicine or part of the required dosage, they loose confidence and try to go directly to those hospitals where medicine is available. Patients are in general more aware of seeing doctor and availing free medicine rather than the quality of service. Lack of necessary equipment and furniture also causes problems to examine patients e.g. examination couch, weight and height measuring machine.

As the female patients do not have separate waiting area, they feel a lack of privacy. Also due to the system of seeing patients in the presence of other patients, they can not express their problems freely. Except for F.P. clinics majority of the female patients are seen by male doctors.

Although 5 to 9 doctors are appointed in each of the UHCs, hardly 2 to 3 doctors work at a time, thus causing overcrowding of patients and hampering the quality of services. Private practice of doctors causes reluctance to see outdoor patients properly.

Except for those doctors who are sharing one clinic, all the doctors found the spaces adequate for the job they are performing. Overall the out-patient areas were found to be most crowded. The situation is enhanced by lack of organisation of activity areas and operational policies which caused certain areas and spaces to be overcrowded with visiting patients, while others remained empty e.g. waiting area away from clinics, corridor facing clinics. As these areas are used by a large number of outside people they get dirty very easily.

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5.1.4 Diagnostic And Treatment Areas:

5.1.4.1 Laboratory:

Services and staffing pattern:

All the UHCs have laboratory facilities. Compared to the radiology services, laboratories of the complexes are providing better service. 75% of them are staffed by two laboratory technicians and the rest by one.

Activities and operational procedures:

The laboratories provide daily routine tests of urine, blood (T.C., D.C.), stool, sputum. They also test malaria slides delivered by field workers. For blood test out-patients go directly to the laboratory, for other tests patients bring sample either from home or use out-patient toilet and deliver directly to the laboratory technician. The result is sent to the respective doctor through the patients. In case of inpatients, the sample is sent by aya/ ward-boy/ sweeper to the laboratory and the result is sent through them to ward nurse and doctor. Only for blood test lab-technician goes to the ward for sample collection. None of the laboratory technician complained against existing workload.

Physical facilities, furniture and equipment:

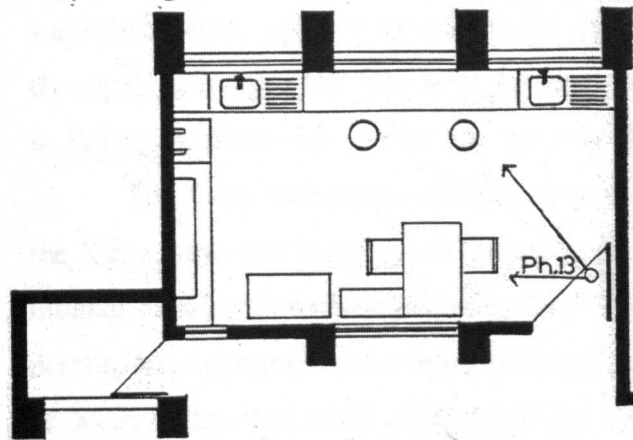
The laboratories are located on the ground floor. It comprises only one room, often with or without any attached toilet. Around 40% of them have attached toilet for sample collection (clinnet). In Bhaluka, Shibpur, Ranisankail and Mohammadpur attempts have been made to keep diagnostic and treatment areas (e.g.X-Ray, Emergency, Laboratory) close together and equally accessible for both out and inpatients. While in old type the location and area varied from place to place. Neither of the types have provision for patients waiting areas.

The size of the main laboratory room varies from 7.83 m² (Chattak) to 26.44 m² (Ishwardi) for similar staffing pattern and workload.(see Fig.5.26)

The old buildings have inadequate furniture, equipment, washing and cleaning facilities compared to the new ones. The new UHCs have wall fixed work-top with cabinets, 1 table, 2 chairs, 2-3 tools, racks for reagents, 1-2 microscope, 1-2 wash basins, bin, cupboard, bottles, testing tubes, small racks to keep samples and other accessories. Shortage of equipment and

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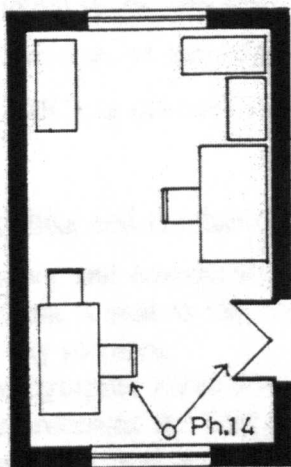
reagents hampered adequate functioning of the laboratories. There appeared to be a lack of adequate light and cleanliness in old buildings.



Laboratory with clinnet in new types. (Bhaluka)



Ph.13 Inside a laboratory: adequate light for laboratory test. (Bhaluka)



Laboratory in old type.(Bakergonj)



Ph.14 Lab-technician at work: inadequate light for test. (Bakergonj)

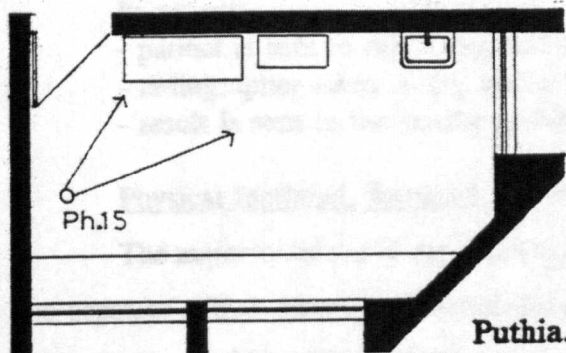
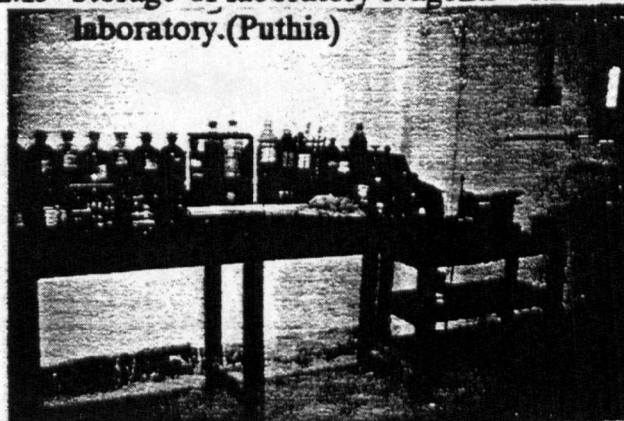


Figure 5.26 : Laboratory

Ph.15 Storage of laboratory reagents within the laboratory.(Puthia)



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5.1.4.2 X-ray:

Although majority of the complexes have space allotted for radiology, only four of them were functioning. Four of the complexes did not have any X-ray technician. Due to shortage in the supply of X-ray films four were not working inspite of having X-ray technician and machine. In Bakergonj there was neither any machine nor any staff.

The X-ray technician/ radiographer is in charge of radiology service. He himself takes the X-ray, processes it and sends the report to respective doctors. There was no radiologist. The number of X-rays taken per month varied between 26 to 70 in four different complexes. Both doctors and radiographer admitted that these facilities are not properly utilised due to shortage of X-ray films and staff. Also there are no arrangements for regular maintenance of these machines. But it was evident from the survey that those who have X-ray facilities could contribute much more than they were providing. Many of the patients had to suffer due to the lack of this service, as majority of the patients can not afford to visit private X-ray clinics. In one of the UHCs, a private X-ray clinic adjoining the main entrance was found to provide the service.

Activities and operational procedure:

Outdoor and emergency patients:

- patient is sent to the X-ray technician/ radiographer by MO with a request form for X-ray pictures,
- radiographer takes X-ray,
- he processes the film in the dark room,
- the result is given to the patient/ patients attendant to deliver to the respective MO.

In-patient:

- patient is sent to the X-ray technician accompanied by nurse/ aya/ ward-boy,
- radiographer takes X-ray and processes it,
- result is sent to the doctor through nurse/ aya / ward-boy.

Physical facilities, furniture and equipment:

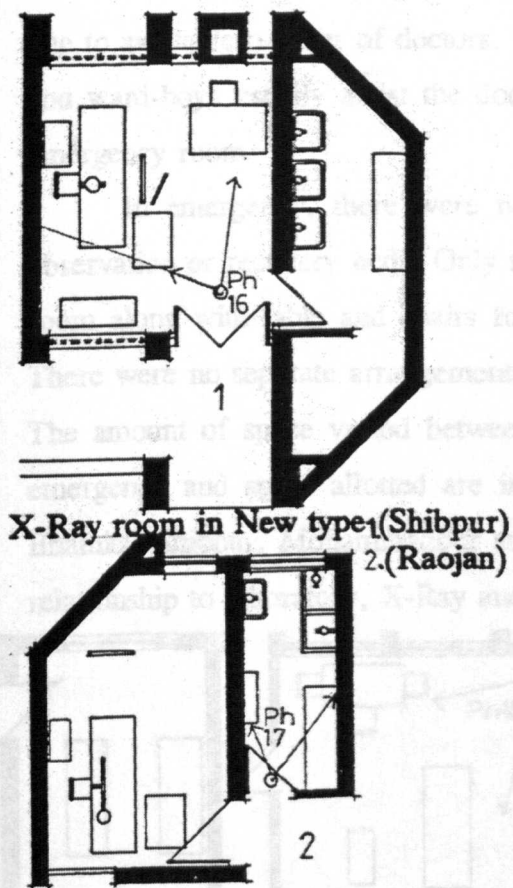
The majority of the X-ray units comprise of x-ray room, dark room and store. There are no separate office spaces or waiting areas for patients. Patients normally wait in front of the door in the corridor. None of them have provision for dress change or dressing cubicles. It is

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located in the ground floor within the out-patient area.

It is evident from the survey that no specific measures had been taken to protect against radiation hazards. The majority were directly accessible from the main corridor. There were no such barrier in-between corridor and X-Ray room and doors were not designed to protect radiation. Thus people passing the corridor and even the radiologist himself were exposed to the radiation.

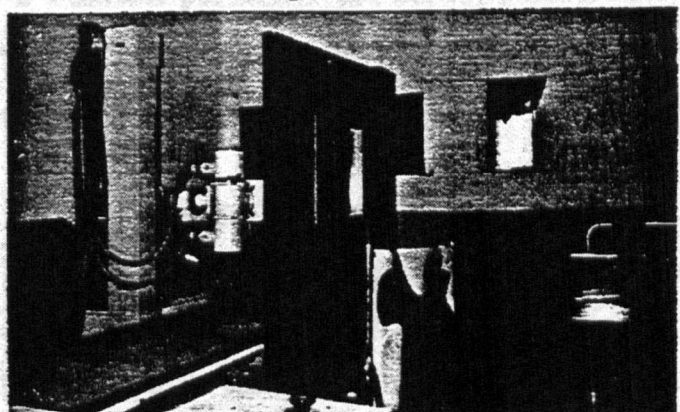
The following figures (5.27) are used to show different x-ray units, types of arrangement, size and shape, furniture and equipment. Size of X-Ray room varied between 12.16m² (Raojan) to 28 m² (Begumgonj). The X-Ray rooms in Bhaluka, Shibpur, Mohammadpur, Ranisankail and Raojan are inadequate. It is difficult to move patient in a stretcher, where about 50% of the space is occupied by X-Ray equipment, furniture and the same space used for official work.



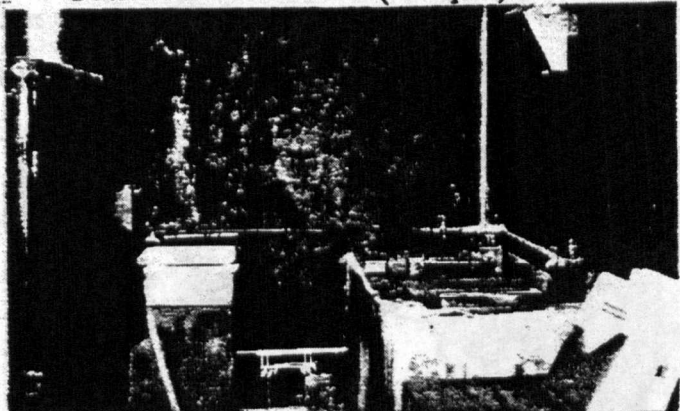
X-Ray room in New type₁(Shibpur)
2.(Raojan)

Figure 5.27 X-Ray

SCALE: 0 1 2 4M



Ph.16 X-Ray room in New type - difficult to move Patient in a stretcher.(Shibpur)



Ph.17 Interior of a dark room.(Raojan)

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5.1.4.3 Emergency:

Emergency service is available in all health complexes. Types of cases dealt in these units are mostly road accident, burn, injury, drowning, poisoning etc. But due to the lack of surgeon and necessary equipment serious cases are immediately referred to the District Hospitals. Minor casualty, stitching and dressings are also performed within the emergency/treatment room by attending MO and nurse.

Except for two, none of the complexes were found to have ambulances in working condition. The emergency cases varied between 10 to 20 per day. But in case of road accident the figure can go up to 50 in a day.

Doctors from the out-patient department have to take charge of emergency by rotation. The usual duty is two days per week and one week-end per month per doctor, while it varies due to available number of doctors. They work on call system for 24 hours. The male nurses and ward-boys usually assist the doctors. Admissions for inpatients are also dealt within the emergency room.

In emergency, there were no specific provisions for resuscitation, patients waiting, observation or recovery beds. Only two to three treatment tables/ couches were provided in a room along with table and chairs for official work of record keeping/ admission procedure. There were no separate arrangements for male and female patients and were accessible to all. The amount of space varied between 12.83m² (Raujan) to 22.58m² (Shibpur). Location of emergency and space allotted are inadequate for old UHCs. On the other hand location in Bhaluka, Shibpur, Mohammadpur and Ranisankail are adequate with separate entry and their relationship to laboratory, X-Ray and admission.(see Fig.5.28)

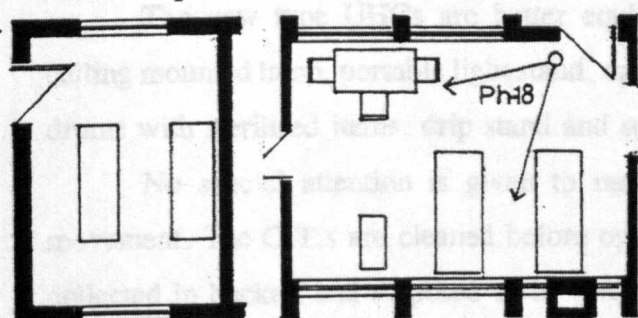


Figure 5.28 Emergency: 1. Old (Bakergonj)
2. New (Shibpur)



Ph.18 Emergency: lack of privacy.
(Shibpur)

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5.1.4.4 Operation and F.P. sterilization:

There are provision for Operating Theatre in all the UHCs, but they are used mainly for minor surgical cases or family planning sterilisation. Lack of any surgical specialist, anaesthetist and necessary equipment are the reason for low utilisation of this area, compelling patients to visit DHs. Thus overcrowding of the limited bed capacity occurs in DHs while the in-patient beds in UHCs remain under-utilised.

The number of surgical cases varied between 15 to 72 in a year. For that reason usually no time table was maintained in any of the UHCs. Only minor surgical cases like abscess and F.P. operations requiring local anaesthesia are carried out in the O.T.

The staff using O.T. comprised of MO(MCH), MO in charge of emergency, UHFPO, FWV, O.T. sister/ nurse and ward boy. Following the American method, anaesthesia is done in the O.T. Ether is used for anaesthesia.

In old type plans the operating area comprised of one operating theatre, one hand wash and one store/ sterilisation area. While in new types a complete block/ section of a block is allocated for the purpose with O.T., scrub-up, sterilisation, male and female change and recovery ward. The O.T. in new type plans have given more care in terms of location and functional areas. But majority of the areas remained under-utilised (e.g. postoperative wards, changing areas) and were found under lock and key during survey.

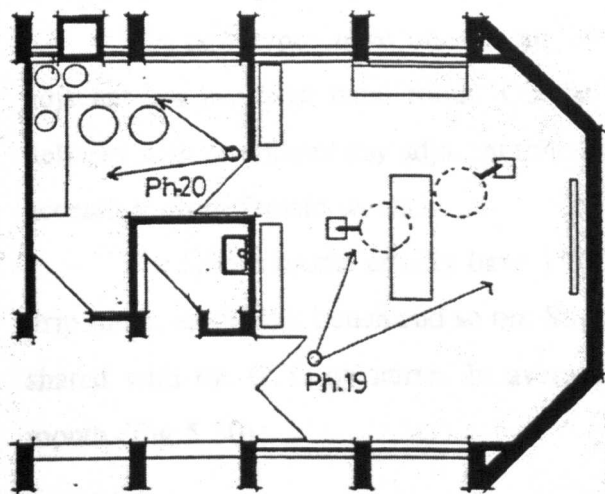
In Bakergonj and Begumgonj, the O.T.s are on the ground floor and directly accessible from the main circulation area. It is also difficult to move patients from O.T. to wards in the first floor where stair is the only means for vertical circulation. The size of O.T.s varied between 18.86m² to 33m².(see Fig.5.29)

The new type UHCs are better equipped with modern equipment and furniture e.g. ceiling mounted lamp, portable light stand, operating table, equipment trolley, side tables to keep drums with sterilised items, drip stand and so on.

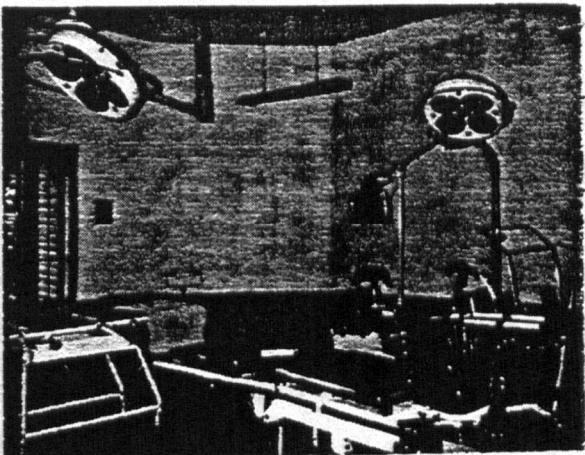
No special attention is given to reduce the risk of cross infection and sequence of movement. The O.T.s are cleaned before operation in the normal procedures. Soiled items are collected in buckets and disposed of by sweeper after the operation, either outside the premise

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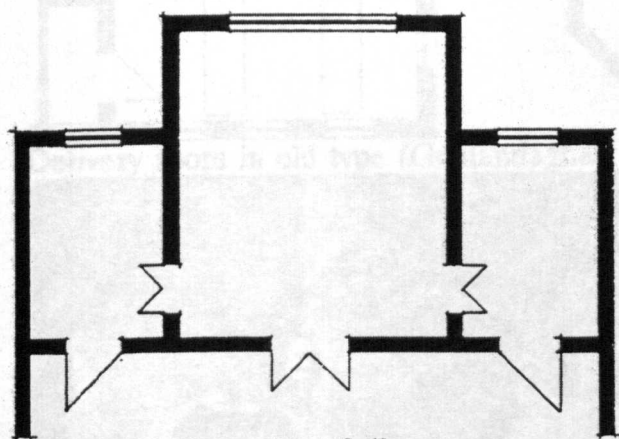
or burned/ buried within the site. But there appeared to be no specific system developed for all the health complexes.



Operating Theatre in new type.(Shibpur)



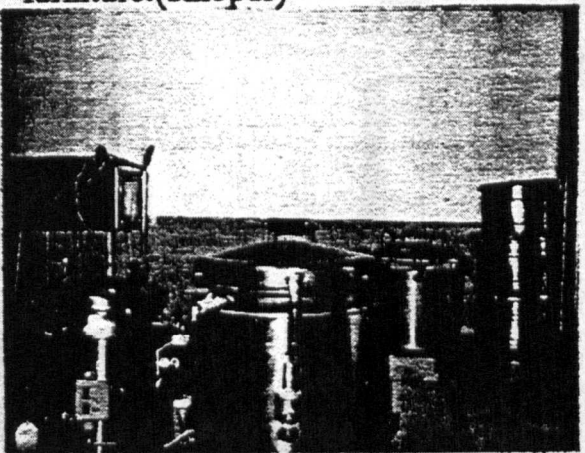
Ph.19 O.T. in new type with modern equipment and furniture.(Shibpur)



Operating Theatre in old type -not in use.(Bakerganj)

SCALE: 0 1 2 4m

Figure 5.29 : O.T.



Ph.20 Sterilisation room with autoclaves and other sterilising equipments.(Shibpur)

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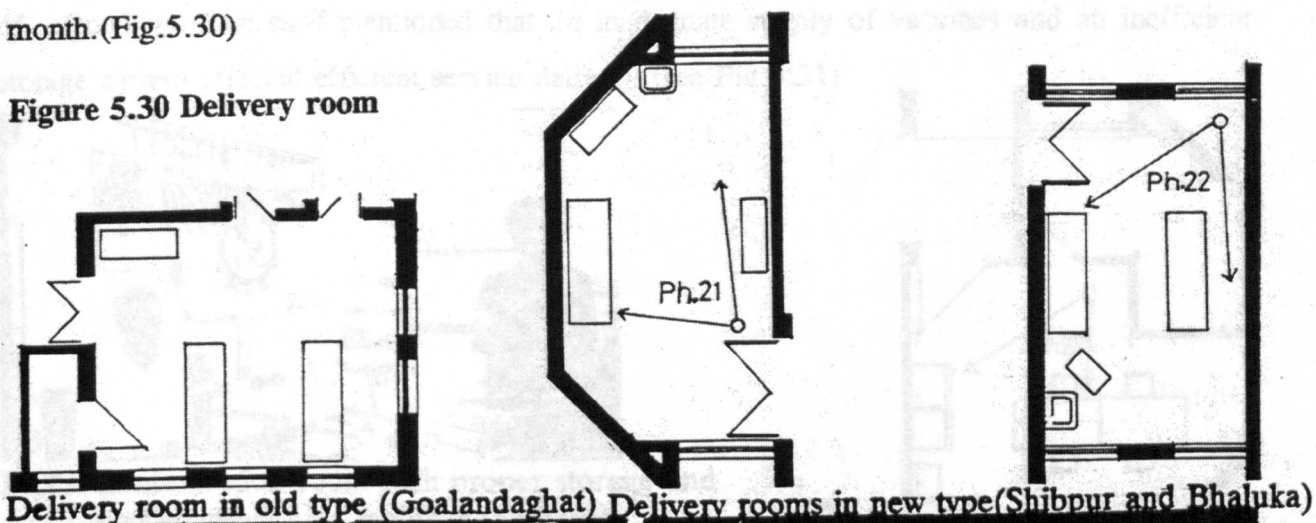
5.1.4.5 Delivery:

Only normal deliveries are done here. The staff consists of MO(MCH), FWV, nurse with midwifery training and aya.

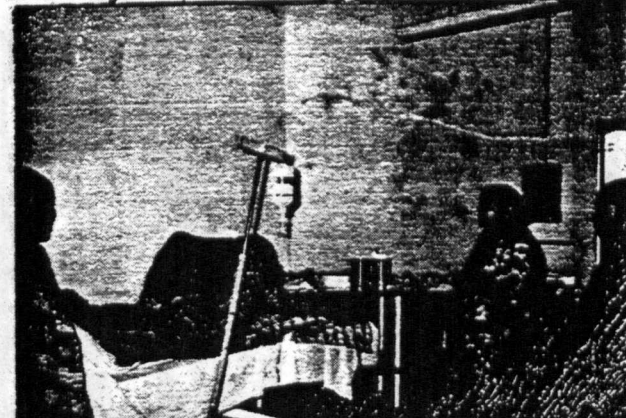
The new types have one labour room, one sluice, one store/ sterilisation room with adjacent pre and post natal room. On the other hand the old ones have only one room for delivery with or without any adjacent toilet/ wash-up area. In old type, labour rooms are directly accessible from female wards.

The labour rooms usually have 1 to 2 delivery couches, trolley to keep sterilised items, drip stand, stool/ low bench and so on. Sterilised items are carried from main sterilisation room shared with the O.T. by nurse. In average the number of cases varied between 5 to 20 per month. (Fig.5.30)

Figure 5.30 Delivery room



Delivery room in old type (Goalandaghat) Delivery rooms in new type (Shibpur and Bhaluka)



Ph.21 Delivery room: privacy is maintained for one patient. (Shibpur)



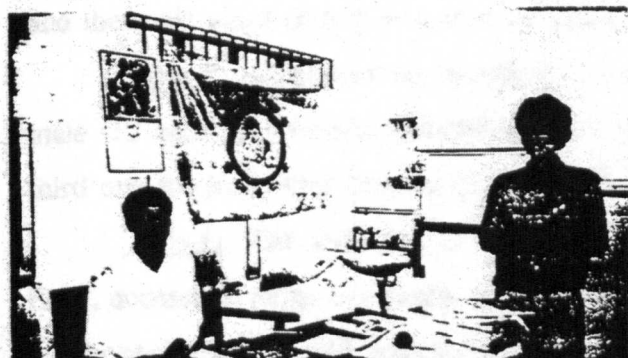
Ph.22 Delivery room for two patients- no visual privacy. (Bhaluka)

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5.1.4.6 Injection and Immunisation:

Injection and immunisation services are provided in all of the UHCs. Expanded Programmes on Immunisation (EPI) were introduced in 1979 to prevent diseases like diphtheria, poliomyelitis, tetanus, T.B., measles and whooping cough. Thus all the centres provide DPT, BCG, Measles, T.T., OPV-3 injections specially for children and expectant mothers. The immunisation clinics are run by EPI technicians assisted by Health Inspector or Assistant Health Inspectors, twice per week. The rest of the working days are used to provide these services through satellite clinics.

The newly constructed UHCs were found to have an adequate number of refrigerators to store vaccines. Preservation is seriously affected by frequent power failure and low voltage of electricity. The staff mentioned that an inadequate supply of vaccines and an inefficient storage system affected efficient service delivery. (see Fig.5.31)



Ph.23 Immunisation room with proper storage and and hand-washing facilities.(Shibpur)



Ph.24 Patient waiting for injection within EPI room in old type.(Goalandaghat)

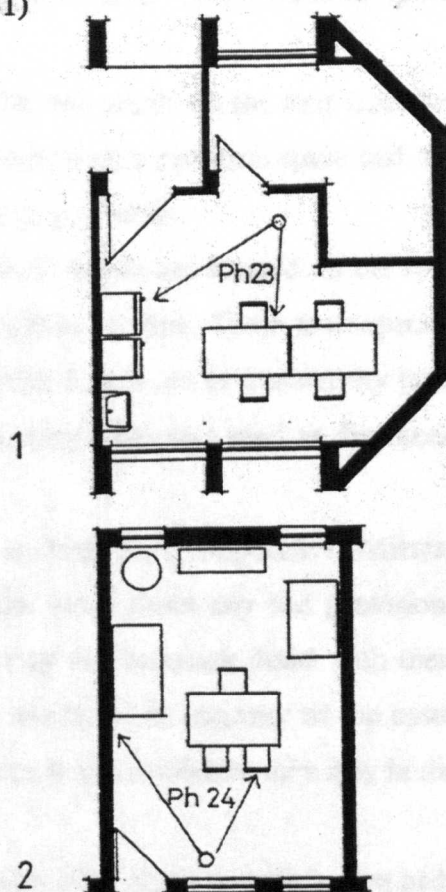


Figure 5.31 Injection and Immunisation
1. new (Shibpur) and 2. old type .
(Goalandaghat).

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5.1.5 Inpatient Areas:

Patient Accommodation:

There are three different ward types in the majority of health complexes: one for male, one for female and children and one for maternity patients. The first two wards are arranged in open nightingale type of wards, but for the last one no specific pattern is followed. Other than Rajan child patients are accommodated within female ward.

Type A: There are mainly two wards: one for females and children (11-16 beds) and one for males (11-15 beds) located on the first floor. The majority of this type do not have separate maternity ward. There is a separate room for male infectious diseased patients attached to the general male ward.e.g Goalandaghat, Kolaroa, Ishwardi, Begumgonj, Bakergonj.

Type B: Here all the wards are located on the ground floor. In Rajan, there are three wards: one for female (12 beds) and one for children (11 beds) accessible from a common space and the male ward (8 beds) in another block near O.T.

Type C: Arrangements in type C are similar to type D: two wards on the first floor for male (12 beds) and female and children (13 beds) are accessible from a common space and the third one for maternity patients (6 beds) is located near O.T. e.g. Puthia.

Type D: The male (12-15 beds) and female (10-11 beds) wards are located on the first floor, accessible from a common space. These are of open nightingale type. There is a separate ward consisting of 3 to 6 beds for maternity patients. In Bhaluka 2 beds out of 6 maternity beds were used for infectious disease patients. Also one of the waiting areas was used as diarrhoea ward.

In all the type plans, it has been observed, there are no beds for postoperative patients. Although in new type plans, there is one post-operative room but without any bed provision. Two of the new complexes have got baby cots, otherwise they are accommodated with their mothers. Children are always accommodated within female wards, as in majority of the cases mothers accompany them. In the cases where female attendance is not available, they stay in the male wards.

There were no separate provisions for patients attendants, they either use the vacant beds

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or floor at night . One attendant per patient is usually allowed in these wards. Mothers of child patients usually share one bed. It was found that as no complexes have provision for infectious diseased patients, they are either accommodated in the waiting area, postoperative room, or within the general ward. In two of the sample UHCs patients staying on the floor has been observed. Nurses of the other UHC also informed the same evidence specially during an epidemic.

Patient number and utilisation:

During survey it was found that records on patient admission, daily attendance, discharges and deaths and so on were not recorded in an uniform way. Only in two UHCs yearly data were recorded in a chart form and available from administrative office. For rest of the cases data were collected from individual wards in different forms. Thus it was not possible to calculate the rate of bed utilisation in individual wards throughout the year and mostly represents current monthly (1-3 months from the date of survey) data.(see Table 5-8)

Name of UHC	Inpatient attendance per month					No. of beds				
	Male	Female	Child	Matern.	Total	Male	Female	Child	Mat.	Infect.
Bhaluka	66	87			153	15	11		5	2
Shibpur	av. 18-28 patients occupancy /day					14	11		3	3
Goalandaghat	76	92			168	11	11			3
Bakergonj	51	61			112	16	15			
Mohammadpur	187	168	.38		393	12	10		6	3
Kolaroa	85	107			192	11	11			3
Begumgonj	120	135			255	14	11			
Raojan	90	57			147	8	12	11		
Chattak	21	17	6		44	14	11		6	
Puthia	87	103			190	12	13		6	
Ranisankail					570	15	10		4	
Iswardi	366	390		24	780	11	12			3

Table 5-8: In-patient admission

Except Mohammadpur and Chattak the number of female patients includes the number of children. The average length of stay and bed occupancy rate, as stated by individual ward nurse, varied from 5 days to 7 days and 40% to 60% respectively. During an epidemic the occupancy rate even exceed 100%. The following figure shows a wide variation in yearly distribution pattern for male and female patient admission in Bakergonj.

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FIG. BAKERGONJ

LEGEND
 MALE
 FEMALE
 TOTAL

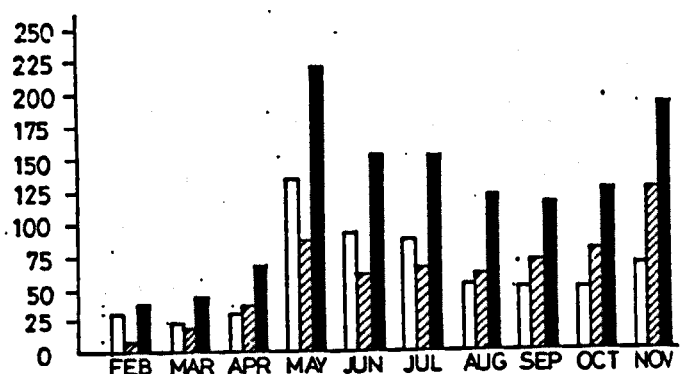


Fig. 5.32 Patient attendance, Bakergonj

Allocation of beds:

The beds were allocated on the basis of sex. Although the beds within a ward were given a number according to specialty, but these were used as per specialty of patient admitted. Allocation of bed to different sex varied from one complex to the other e.g. for males 8(Raojan) to 16(Bakergonj) beds and for females 10 (Ranisankail) to 15 (Bakergonj). When the bed allocation is compared with patient admission it revealed that the female and child patient admission was much more than the male patients while the number of beds allotted for male outnumbers the number of beds for female and child. It is clearly evident from the study that no account had been given to patient admission in deciding the allocation of beds.(see Table 5-9)

Name of the UHC	Total no. of beds	no. of wards						Number of beds					
		M	F	C	Ma	I	M	F	C	Ma	I		
A. DHAKA DIV.													
1. Bhaluka,	33	1	1	-	2	1	15	11	-	5	2		
2. Shibpur,	31	1	1	-	1	1	14	11	-	3	3		
3. Goalandaghat	25	1	1	-	-	1	11	11	-	-	3		
B. KHULNA DIV.													
1. Bakergonj,	31	1	1	-	-	-	16	15	-	-	-		
2. Mohammadpur,	31	1	1	-	1	1	12	10	-	6	3		
3. Kalaroa,	25	1	1	-	-	1	11	11	-	-	3		
C. CHITTAGONG													
1. Begumgonj,	25	1	1	-	-	-	14	11	-	-	-		
2. Raujan,	31	1	1	1	-	-	8	12	11	-	-		
3. Chattak,	31	1	1	-	1	-	14	11	-	6	-		
D. RAJSHAHI DIV													
1. Puthia,	31	1	1	-	1	-	12	13	-	6	-		
2. Ranisankail	29	1	1	-	2	-	15	10	-	4	-		
3. Iswardi	26	1	1	-	-	1	11	12	-	-	3		

Table 5-9: Allocation of beds Legend: M= Male, F=Female, C=Child, Ma=Maternity, I=Infectious disease.

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Patient's Supervision:

In the UHCs patients supervision rested mainly on the duty nurse, but patients attendants play a major role. The nurses keep patients record, observe and monitor patients condition, administer medication, while the attendants feed them, assist them to dress change and toilet. Child patients are usually looked after by their mother.

Nurses work in three shifts: from 7am to 2pm (av. 2 nurses), from 2pm to 8pm (av. 2 nurses), from 8pm to 7am (av. 1 nurse). The nurses in the male and female wards also perform duties in the maternity and infectious disease wards. A number also attend in the delivery and operating theatre. Male nurses usually work in the emergency and O.T.

Physical facilities: (see Fig.5.33)

The in-patient areas are comprised of patients accommodation, nurses and doctors rooms, toilets, stores, waiting and circulation areas. Different types of space organisation, location, size and shape of rooms are identified in the sample UHCs.

Type A:

There were no separate maternity ward. Although official records and government statistics show six maternity beds in each UHCs, in old type plans they are mostly accommodated within the female wards. The wards are not also designed to accommodate these extra six beds. The labour room is directly accessible from female ward. This hampers audio-visual privacy. Also space allotted for male and female wards are same in contrast to the bed numbers to be provided.

Nurses station, shared between two wards is often suitable for low staffing pattern. But here the location of nurses station has no visual contact with the patient areas. This has resulted in increased walking distance for nurses. On the other hand patients attendants have to take more responsibility to call nurse in case of any need or emergency. There is a separate infectious disease ward, attached to the male ward. This is also far away from nurses station.

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Type B:

In Raojan the female and child wards are grouped together in one block with labour room, nurse's duty room and stores in between. The male ward is located beside the O.T. without any duty room. Each of the wards have attached toilet at one end.

Type C and D:

The maternity beds are away from nurses station and for low nursing pattern this affects supervision. For example in Puthia and Chattak, nurses station is far away from ward and often lacks visual control and supervision of patients.

All wards:

The ward arrangement, in general, is less flexibility for sharing the beds in times of need. There were no provision for infectious diseases in new types and postoperative patients in old types. Toilets are provided at one end of the wards and patient from the other end have to cross the whole ward area. The toilets are also often directly visible from certain beds. As most of these toilets are not properly maintained, these become a source of nuisance.

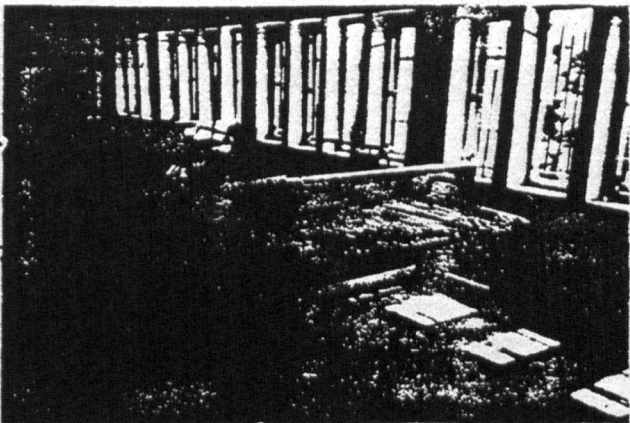
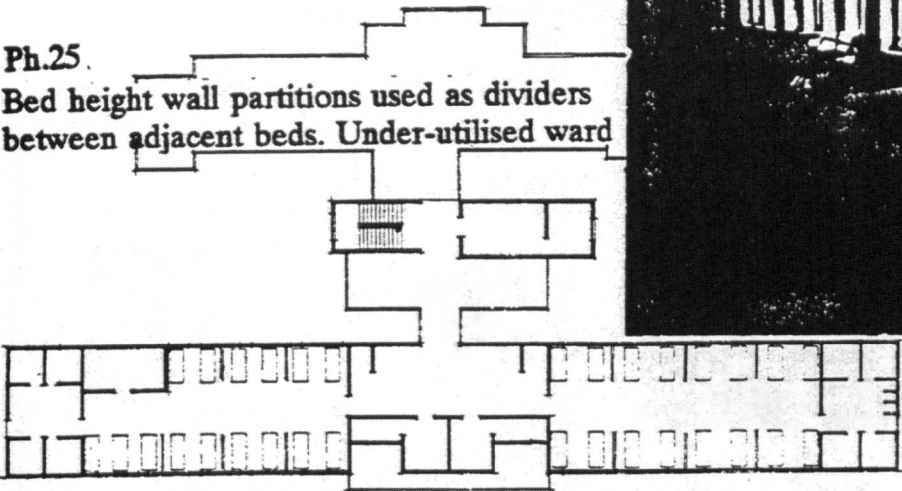
There are no separate dirty utility rooms and often this function is shared with clean utility in the same store. As there are no semi-exterior spaces for patients and visitors, all visitors gather within the ward area.

No standard is maintained for bed spacing. This is clearly evident from the ward size and bed numbers provided in each ward. The bed centres varied from 1.55m to 1.87m. When the spaces between two beds are wide enough, patients are accommodated on floor. In Bakergonj bed height wall partitions were used as dividers between adjacent beds.

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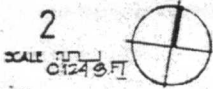
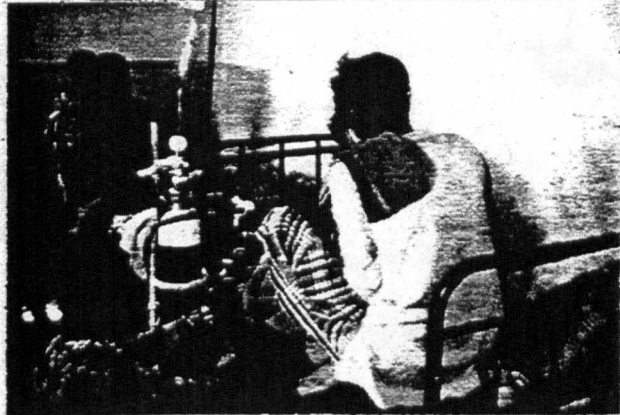
Ph.25

Bed height wall partitions used as dividers between adjacent beds. Under-utilised ward



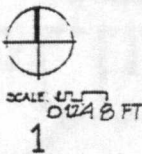
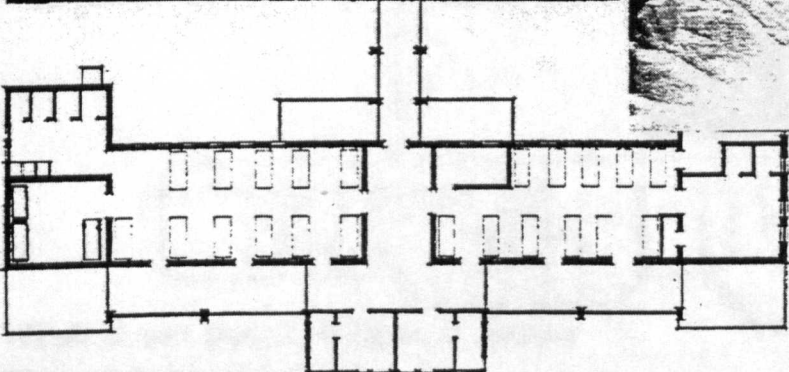
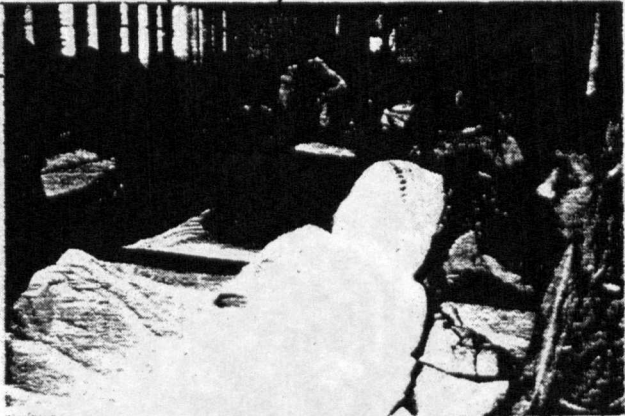
Ph.27

Infectious disease and serious cases within male ward. (Iswardi)



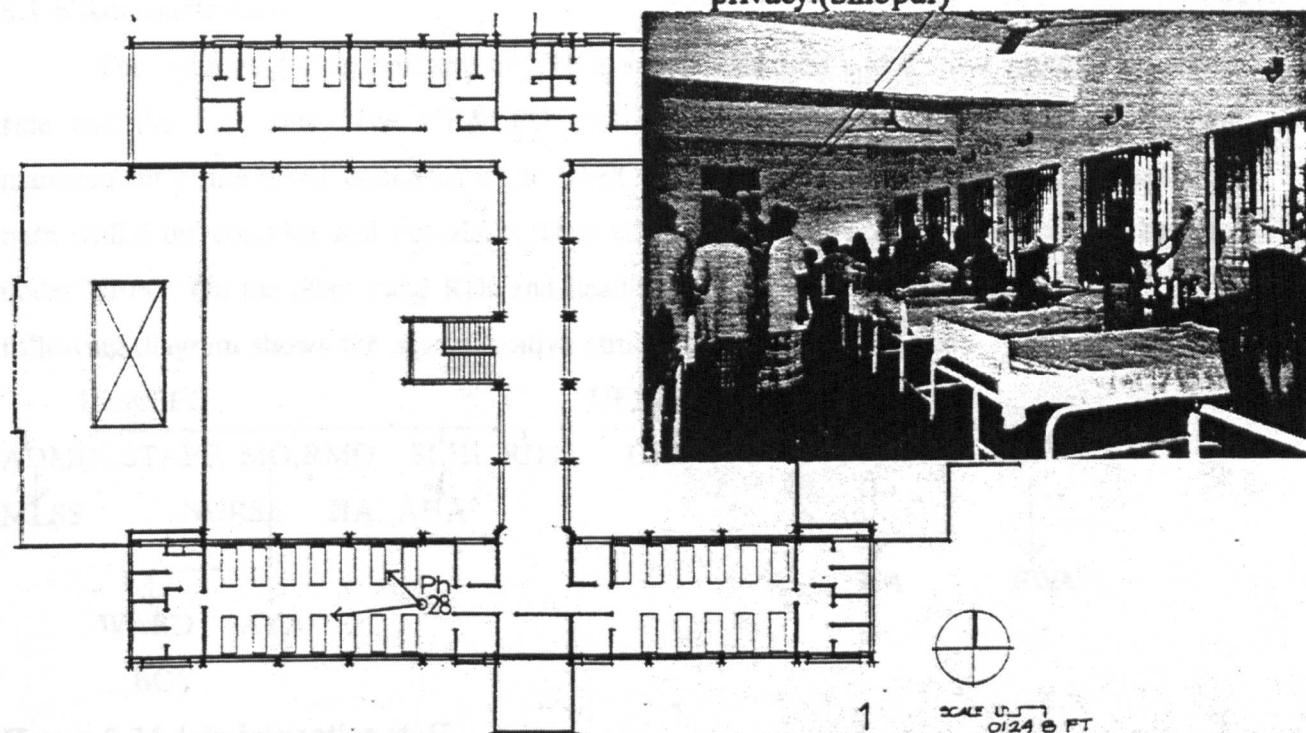
Ph.26

Female ward in old type - beds placed close to each other. (Iswardi)

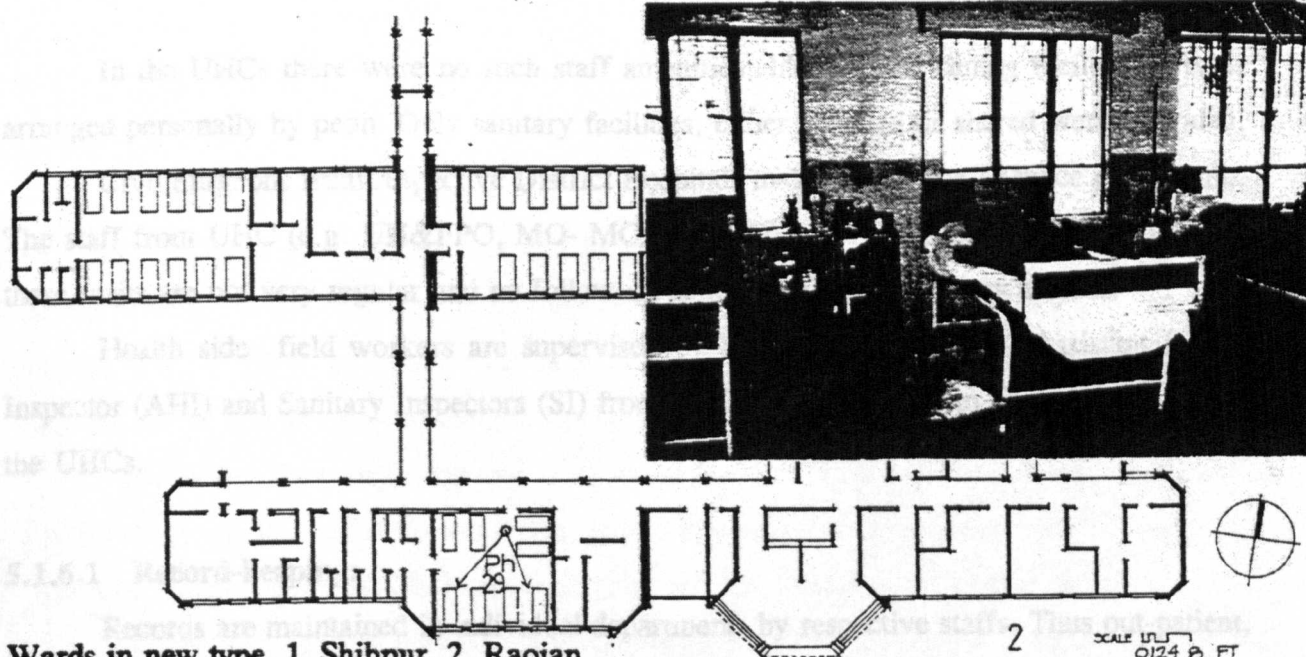


Wards in old type. 1. Bakergonj, 2. Iswardi.
Figure 5.33: In-patient areas

Ph.28 Male ward crowded with visitors, no visual privacy.(Shibpur)



Ph.29 Male ward in Raojan with adequate bed spacing



Wards in new type. 1. Shibpur, 2. Raojan

Figure 5.33 In-patient areas

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5.1.6 Administration:

The administrative structure of UHCs are divided into two distinct groups, the health side and the F.P. side. The UH&FPO remains responsible for overall organisation and management of the health complex, while UFPO administers all MCH and FP related activities both within the complex and outside it. Thus all the UHFWCs and FP side field workers are under UFPO. On the other hand RDs and health side field workers are under UH&FPO. The following diagram shows the administrative structure of the complexes.

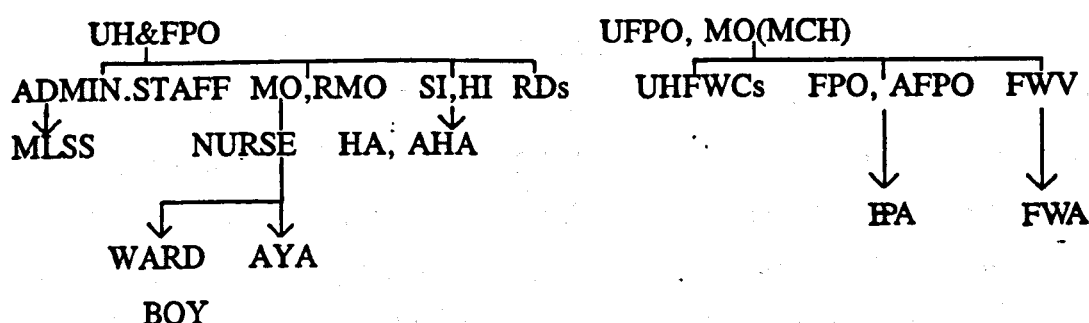


Figure 5.34 Administrative staff

In the UHCs there were no such staff amenities, like tea and dining facilities. Tea is arranged personally by peon. Only sanitary facilities, either attached or shared were provided.

Civil Surgeons from respective District Hospitals make visits once or twice per month. The staff from UHC (e.g. UH&FPO, MO- MCH, UFPO) supervise RDs and UHFWCs. But these visits are not very regular and no follow-up actions are taken from such visits.

Health side field workers are supervised by Health Inspector (HI), Assistant Health Inspector (AHI) and Sanitary Inspectors (SI) from UHCs and they meet to report their work in the UHCs.

5.1.6.1 Record-keeping:

Records are maintained in individual departments by respective staffs. Thus out-patient, inpatient, emergency, F.P. office, and so on keep their own records separately. Only 33% of the complexes were found to maintain yearly records of patient data. Again there was no

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standard format to record patients data. For example inpatient data was recorded in some places as annual admission and in some places as daily attendance. In a number of UHC, emergency cases are added to the out-patient attendance. The surveillance and monitoring of data is hardly ever done in UHCs and it is also difficult to perform without adequate recording and compilation of data.

5.1.6.2 Teaching and Training:

All the UHCs provide teaching and training services for H.A., FWA, FWV, MA, and AHI by UH&FPO, MO-MCH, Civil Surgeon, HI and SI. There is no fixed time table for teaching and training. Some teaching programmes continue for five days in a month from 10am to 4pm. In Chattak, Puthia and Raojan there are separate training/ teaching rooms, while in others either the waiting area or any multipurpose area is used for the purpose. In Bakergonj, the X-Ray room is converted for teaching. The furniture and fittings usually comprises a table, a black board and a number of benches.

5.1.7 Support Services:

5.1.7.1 Catering:

All the UHCs provide three meals per day, but only to the patients, i.e. breakfast, lunch and dinner. The catering services are run by private contractors. The breakfast items include bread, banana and tea, while lunch and dinner are served with rice, lentil soup and fish with vegetable curry. Meat is served once in a week. Every morning the nurse in charge sends requests for normal and special diets to the cook.

The kitchen generally comprises cooking and preparation areas, a store and /or a pantry, a toilet and a small verandah to receive supplies and also to be used as a service entrance. The store is used for non perishable items (e.g. rice, oil, lentils and so on) while perishable items (e.g. vegetables, fish, meat) are supplied on daily basis. The majority of the kitchens have no proper washing or food serving areas. The cooking is done over wood fires. There is also no space for bulk storage of fire wood. In Bhaluka the pantry was converted for the storage of fire

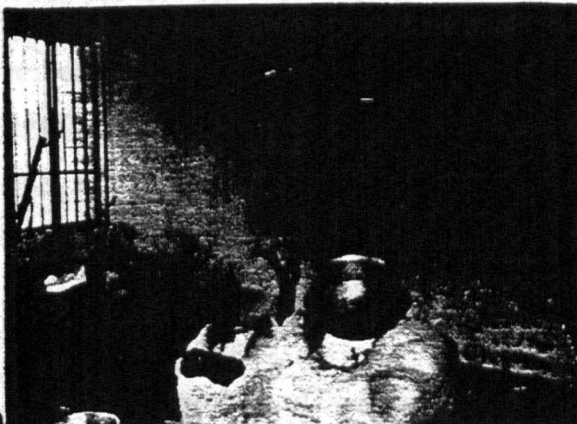
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wood, while in the other UHCs one corner of the kitchen was used. In a number of UHCs, pantries were used to provide accommodation for the cooks and/ the assistant cooks.

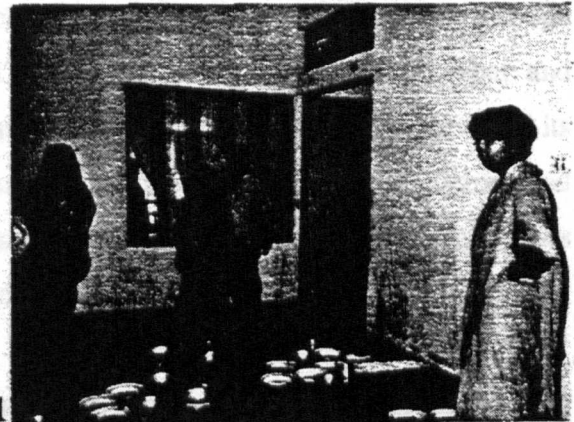
Cooked foods are served in bowls in the kitchen or pantry, taken to the entrance lobby of the wards by the cook, assistant cook and ward boy/ aya (female ward assistant). The food is then distributed on individual plates, taken to the wards and served to the patients by ward boy/ aya under the supervision of the nurse in charge.

As the food is provided free of charge, patients have nothing to say about the quantity or the quality. Those who can afford bring food of their own.

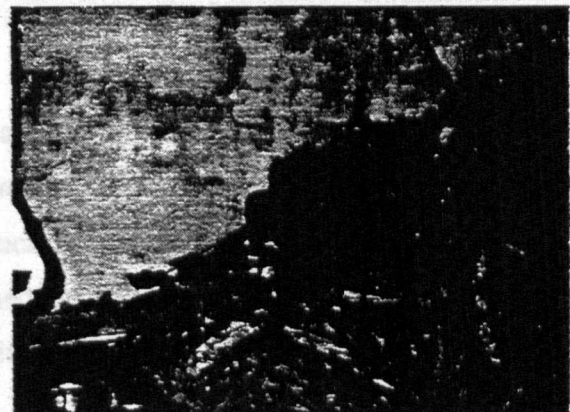
It was observed from the survey that the majority of the kitchens were dirty due to the lack of proper storage, preparation, washing spaces and personal management. The kitchen walls and roofs were stained with soot from the fire because of inappropriate ventilation systems. The kitchen seemed to be one of the most neglected areas in the whole complex.



Ph.30 Inadequate ventilation and use of fire wood caused stains on wall surfaces. (Shibpur)



Ph.31 Distribution of food on individual plates in front of ward doors, in the lobby.(Shibpur)



Ph.32 Storage of fire wood.(Shibpur)

Figure 5.35 Kitchen

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5.1.7.2 Supply

The supply items mainly include medical equipment, drugs, medicines, vaccines, surgical instruments, dressings, laboratory supplies for pathological tests, X-Ray films and necessities, oxygen, linen, stationary and so on.

Adequate supplies of necessities and proper storage and distribution systems are essential prerequisites for efficient service and delivery. Acute shortages of drugs, medicines and X-Ray films are common to all of the health complexes. All categories of users (e.g. doctors, nurses, patients, pharmacists, X-Ray technicians) complained about the inadequate supply of all items. There were no blood banks and ambulance services were available in only 25% of the health complexes.

The supply of all necessary items is received from the District Reserve Store (DRS) under the Civil Surgeon, usually 2 to 4 times a year depending on the item of supply. The requisition/ request form is sent from the individual department to the DRS office through respective administration. Supplies are received at the central store by the store keeper and distributed to the individual departments. The Family Planning side of the OPD maintains its own store, while the rest of the departments are served by one central store. Medicines and drugs for the pharmacy are supplied on a daily basis, while frequency of supply for other items varies e.g. the laboratory reagents are supplied twice in a year.

Problems identified:

- due to the shortage of X-Ray films proper diagnosis of the patients is greatly affected. At the same time, the time and skill of the radiographer is not properly utilised.
- due to the shortage of surgical apparatus, oxygen cylinders, anaesthesia and other necessities Operating Theatres remain under-used.
- shortage of reagents and chemicals for pathological tests.
- inadequate furniture and medical apparatus for outdoor clinics; most apparent in the old/ converted type plans. The lack of examination couch is prominent in majority of the clinics.
- absence of any ambulance facilities prevents immediate transfer of the seriously ill/ injured / surgical patients to the District or referral Hospitals.

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- Inadequate supply of drugs affects treatment of patients and is thus one of the main reasons for by-passing the UHCs and overcrowding the District Hospitals.

5.1.7.3 Disposals:

Used items are disposed of in bins or buckets and collected and disposed of by sweepers. These are disposed at one corner of the health complex or in a nearby ditch. Some of the items are incinerated if required.

5.1.7.4 Sterilisation:

Sterilisation of surgical equipment, linen and gloves is required for general surgery, Family Planning sterilization, delivery and emergency cases. This service is centralised. The whole sterilisation procedure is run and supervised on an 'ad hoc' basis by the O.T. nurse, assisted by aya/ ward boy. As the number of surgical cases is not large, the procedure is run only before any operation takes place.

The new type designs have a purpose made sterilising area attached to the O.T., whereas in the old type designs sterilising was done within the O.T. Even the new spaces provided for sterilising were found to be inadequate for the autoclaves and other equipment. Due to the lack of maintenance a number of machines were found to be out of use.

5.1.7.5 Cleaning:

The Health complexes are cleaned once or twice per day by sweepers. It was observed from the survey UHCs that the personal initiative of the administrators (UHFPO) plays a major role in the cleanliness of the whole complex. A number (40%) of the complexes were found in a good state along with well maintained internal courtyards and front gardens.

The sweepers clean the floors with the aid of a wet mop. The O.T. and the Delivery rooms are cleaned before operations and deliveries. The nurse in charge supervises the cleaning procedure. Public toilets, unused parts of corridors and kitchens were found to be the most neglected areas in this respect. Inappropriate use of the toilets by the patients and negligence of

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the sweepers caused many of the WC's to be out of use.

5.1.7.6 Laundry:

Linen is washed outside the premise by washermen. They wash the linen in a pond or river, dry it in the sun, iron and deliver to the central or ward store. Linen in the wards is not changed regularly. Usually one set of linen is provided per long stay patients and is used sometimes by more than one short stay patient.

5.1.7.7 Maintenance:

There are no specific arrangements for the yearly maintenance of either the buildings or equipment.

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5.2.0 UNION HEALTH AND FAMILY WELFARE CENTRES (UHFWC)

5.2.1 General Aspects:

5.2.1.1 Location, distribution, catchment population and area of influence:

As envisaged in the Government policy, the UHFWCs are located in the Unions with catchment populations of from 10000 to 50000. The majority of the centres are located in rural areas, while a small percentage are constructed within upazilla in a semi-urban setting. All these localities have facilities essential for day to day life, such as markets, schools, charitable dispensaries, Union Parishad Office, residential accommodations, mosques and so on. Around 75% of the sample UHFWCs are isolated structures surrounded by low lying areas.

In some localities (e.g. Shamvupur, Versa) both Rural Dispensaries (RDs) and UHFWCs are functioning side by side. For others the nearest RD/UHFWCs are located within 1.61 to 9.66 kilometres. It appeared from the survey that during site selection little account had been paid to the location of the existing RDs. Thus, some unions have both UHFWC and RD, while a number have none.

There is a wide variation in catchment population. Patients do not necessarily come from the same union, the centres also cater for adjacent unions.

5.2.1.2 Infrastructure and Service Facilities:

Of the surveyed UHFWCs, 77% are connected with the respective Upazilla headquarters by metalled, 64% by seasonal, 20% by katcha roads and 22% by boats. A number of UHFWCs lack proper communication network, for example even in the dry season the users have to travel on foot and cross the streams by ferry boats. In one case it took 3 to 4 hours to cover a distance of 5 miles. The majority of the users attend clinics on foot. Rickshaws, rickshaw vans, boats and cycles are the alternative modes of transport for both staff and patients. Those near the main roads are also accessible by bus, car or auto rickshaws. During the rainy season and flood, boats are cited as the only means of communication for a large number of UHFWCs.

All purpose built UHFWCs were provided with one tube well for the centre building and

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two for the staff quarters. But 40% of the tube wells (centre buildings) of the sample were found to be out of order. Lack of maintenance and pilferage of parts were cited as the main reasons. Water is collected from tube wells in buckets by hand pump. There were no filtering and storage systems. Information on capacity or daily usage could not be accumulated from the health centres.

No surface drains were provided in any of them. As all the UHFWCs have nearby low lying areas, ground slope is used to clear rain water. For night soil and other waste, septic tanks and soak wells were constructed.

None of the health centres have an electricity supply. Where it is available, users of the staff quarters have arranged their own. Kerosene lamp is used as the alternative means.

5.2.1.3 Services and Facilities offered from the unit:

The UHFWCs provide basic health services to general out-patients (male, female), mother and child health care (MCH) including under five's, family planning, health education, teaching and training, record keeping and support services. Immunisation of children and pregnant women are delivered from 30.5% of the centres. Referral of patient to upper levels is provided only verbally. Surveillance and monitoring of recorded data is done by field workers.

The following facilities are provided in each UHFWCs:

1. two clinics for general outpatients, MCH including under 5, F.P. services
2. Pharmacy and store
3. Treatment room for F.P. and emergency patients
4. Recovery for F.P. and emergency patients
5. Central waiting, health education and teaching area
6. Sanitary facilities for patients and staff
7. Tube well
8. office work for field level workers

Staff quarters are provided for Medical Assistant and Family Welfare Visitor within the health centre premise.(see Table 5-10)

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Table 5-10: Services offered from the unit

	A 1 2 3 4 5 6 7 8 9	B 1 2 3 4 5 6 7 8 9	C 1 2 3 4 5 6 7 8 9	D 1 2 3 4 5 6 7 8 9
1. MCH + under five	/ / / / / / / / /	/ / / / / / / / /	/ / / / / / x / /	/ / / / / / / / /
2. Basic H. Services	/ / / / / / / / /	/ / / / / / / / /	/ / / / / / / / /	/ / / / / / / / /
3. F.P. Services	/ / / / / / / / /	/ / / / / / / / /	/ / / / / / x / /	/ / / / / / / / /
4. F.P. Sterilis.	x / / x x x / / x	x x / / x x x x /	/ x / x x / / / x	/ x x x / x / x x
5. Health Education	x / / / / / / / /	/ / / / / / / / /	/ x / / / / / x /	/ / / / / / / / /
6. Screening Referral	nil only verbal			
7. Support services	/ / / / / / / / /	/ / / / / / / / /	/ / / / / / / / /	/ / / / / / / / /
8. Surveillance and monitoring	nil			
9. Teaching and training	/ / / / / / / / /	/ / / / / / / / /	x x / / / / / x /	x x x x x x x x /
10. Other Immunisation	/ x x / x / x x /	/ x / x x x x x x	x x x / x / x x /	/ x / x x x x x x

LEGENDS: A. Dhaka: 1. Tetuljhura, 2. Shamvupur, 3. Joymontop, 4. Kaijuri, 5. Elenga, 6. Birtara, 7. Kalika Prasad, 8. Pubail, 9. Laxmigonj, B. Chittagong: 1. Fazilpur, 2. Chowara, 3. Shuhilpur, 4. Tamta 5. Kuakup 6. Ranihat, 7. Monmukh, 8. Paniundha, 9. Kuchi, C. Khulna: 1. Dariapur, 2. Baradi, 3. Parahati, 4. Mukarimpur, 5. Lebutala, 6. Khazipur, 7. Lebukhali, 8. Jatrapur, 9. Dighalia, D. Rajshahi: 1. Kamarpukur, 2. Subgram, 3. Tetulia, 4. Kishoregari, 5. Ekarachali, 6. Kamat Kajaldighi, 7. Chowgram, 8. Khamar, 9. Varsha. Note: / = available x = not available

5.2.1.4 Staffing pattern:

The UHFWCs are supposed to have one Medical Assistant, one Family Welfare Visitor (FWV), one pharmacist, one aya (female assistant) and one peon / guard. But 8% of MAs, 5% of FWVs, 42% of pharmacists, 5% ayas and 11% of peon/guard's posts were found vacant in the surveyed UHFWCs. Due to staff shortage, the rest had to share the workload of others. (see Table 5-11)

The MA remains responsible for the whole health centre. Other than overall administration, he attends the general out-patient clinic, emergency patients, field visits and maintains records. The FWV runs the MCH, under 5 and F.P. clinic. She is also responsible for domiciliary and outreach F.P. and MCH care, nutrition supplementation activities and F.P. treatment/ operations. Distribution of medicine, store management and record keeping are the

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responsibility of a trained pharmacist. Aya and peon/ guard assist FWV and MA in the clinics and field visits and are also responsible for cleaning, gardening and other accessory works. Field workers use the centre for their official work. They organise monthly meetings to report their field work and to prepare monthly programmes.

	A	B	C	D
	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9
Medical Assistant	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1	1 x 1 1 1 1 1 1 1	x 1 x 1 1 1 1 1 1
Family W. Visitor	1 1 1 1 1 1 1 1 1	1 1 1 1 x 1 1 1 1	1 1 1 1 1 1 1 1 1	1 1 1 x 1 1 1 1 1
Pharmacist	1 1 x x 1 x x 1 x	1 1 1 1 1 1 x 1 1	x x x 1 1 1 1 1 x	x 1 x x 1 x 1 1 x
Family W. Workers	4 5 6 8 8 3 5 9 6	5 6 6 6 - 4 3 5 3	5 5 6 6 8 3 4 6 6	5 8 4 7 6 - 7 4 5
Peon	1 1 1 x 1 x x 1 1	1 1 1 1 x 1 1 1 1	1 1 1 x 1 1 1 1 1	x 1 x 1 1 1 1 x 1
Aya	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 x 1 x	1 1 1 1 1 1 1 1 1
Night Guard	x x x 1 x x x x x	x x x x 1 x x x x	x x x x x x x x x	1 x 1 x x x x x x

Table 5-11 Staffing pattern

Legend—data not available; x = no staff.

5.2.2 The Health Centre Building:

5.2.2.1 Site plan and building layout:

Site plans varied with the size of the plots, access to the site, orientation and site condition. The land area varied between .66 acre to 1 acre. Due to absence of any boundary wall, it was difficult to get an idea of total site. Attempt has been made to keep the centre building near the main access road. All the UHFWCs surveyed had one centre building and two staff quarters with detached sanitary facilities. The location of the buildings varied from site to site. The majority of the buildings have north-south orientation. The sites have scope for future expansion.

All the UHFWCs surveyed were of the same type plan. It is a simple cross shaped plan.

There are basically three groupings:

1. Diagnostic/ consultation area
2. Waiting area with dispensary
3. Treatment and recovery

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The waiting area is placed centrally, shared by both male and female patients with direct access to MA's room. It has also got a window to receive medicine from the pharmacy. On one side of the waiting area are two rooms for FWV and field workers, accessible from a corridor. The other side has similar rooms for treatment and recovery which are kept indirect from main waiting to enhance privacy of the areas.

Two latrines have been provided which are located outside the building, one for male and one for female. There is provision for staff quarters within the same site.

Room height is standard at about 10 ft.(3m). Attempt has been made to provide natural light and cross ventilation in each room. (see Fig. 5.36)

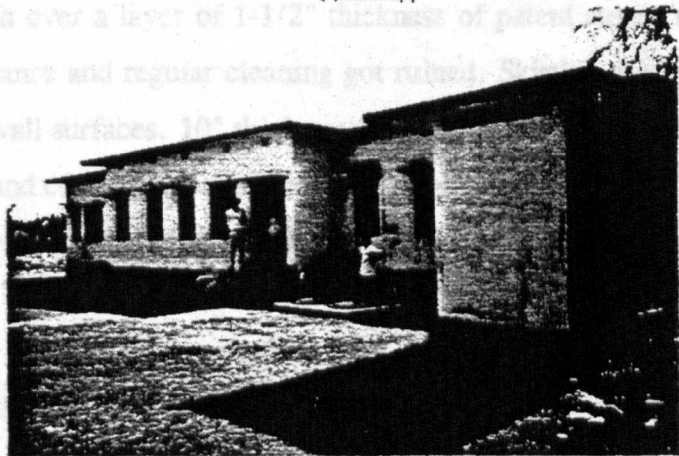
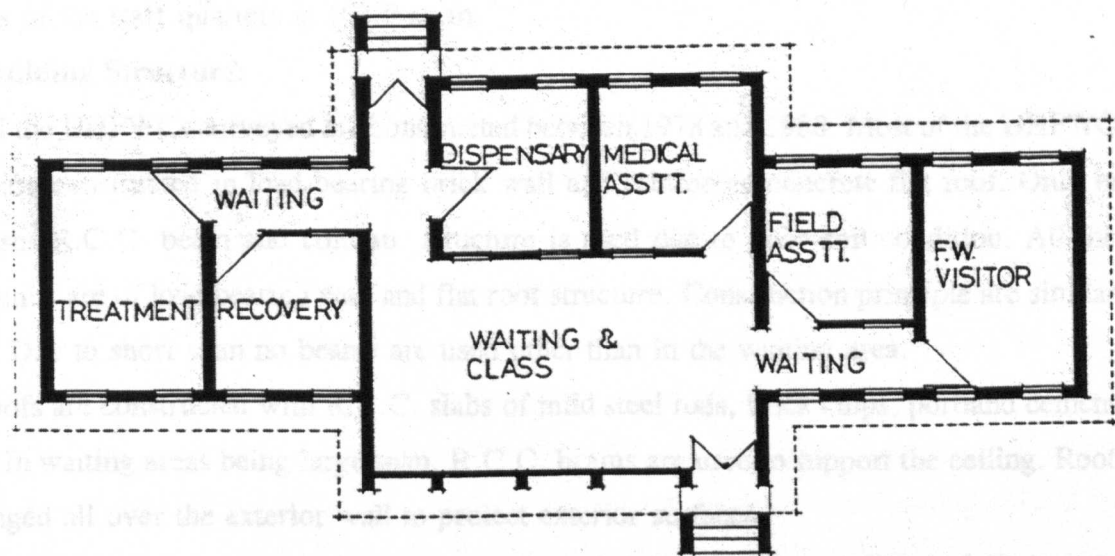


Figure 5.36: Plan of UHFWC Ph.33 A typical UHFWC with detached toilet and tube-well

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5.2.2.2 Surface Area:

The UHFWCs consist of the following areas:

Functional areas	Area in sq.m.
Waiting area/ class room	34.00
Recovery	9.66
Treatment room	13.94
Sub-waiting area/ circulation (near treatment and recovery)	3.90
Dispensary	10.03
Consultation and examination (MA)	10.03
Field Assistant's room	9.66
Consultation and examination (FWV)	13.94
Sub-waiting area/ circulation (near consulting room)	3.90
Net area of the building	109.11
Gross area of the building	135.26
Gross area of the staff quarters is 103.9 sq.m.	

5.2.2.3 Building Structure:

All the UHFWCs surveyed are constructed between 1978 and 1988. Most of the UHFWC buildings are constructed in load bearing brick wall and reinforced concrete flat roof. Only in certain cases R.C.C. beam and column structure is used due to poor soil condition. All the surveyed units are of load bearing wall and flat roof structure. Construction principle are similar to UHCs. Due to short span no beams are used other than in the waiting area.

Roofs are constructed with R.C.C. slabs of mild steel rods, brick chips, portland cement and sand. In waiting areas being large span, R.C.C. beams are used to support the ceiling. Roof is overhanged all over the exterior wall to protect exterior surfaces.

Floors have neat cement finish over a layer of 1-1/2" thickness of patent stone, mostly gray colored. Due to lack of maintenance and regular cleaning got ruined. Skirting are used up to 6" height throughout the internal wall surfaces. 10" thick masonry walls are used with burnt clay brick, mixture of ordinary portland cement and sand mortar as a binding material. 5" thick brick walls are used internally for some parts where 10" walls are not necessary for structural reasons.

10" thick brick columns are used in the external surface of waiting area. Walls are constructed from first class brick with two types of external finishes. A number, around 30%, have exposed brick wall with flush pointing in sand-cement mortar. The other have plastered

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surface with white wash.

Door and window frames are made of ms angle or timber planks. Door shutters are of wood and window shutters are either of wood or glass. Most of the wooden frames and shutters are found in worse situation mainly due to the use of unseasoned timber causing difficulty in opening or closing the shutters. Frames and shutters are painted with enamel paints. For security reason m.s. grills are used in the windows. Sunshades are used for all windows to protect from rain and sun and small ventilators for air circulation.

In a large number of units the external walls are found to have stains and black patches. Exterior surfaces of the buildings with plaster and white wash are mostly ruined due to rain and flood. More over as there is no boundary wall these surfaces are used for posters during election.

Lime terracing are also used over the floor ceiling. The main problem found in these buildings is lack of regular maintenance, turned those as unhealthy place rather than a healthy place.

Environment: All the UHFWCs have adequate natural light and ventilation, as most of these buildings are oriented towards North-South direction. Moreover attempts have been made to keep windows in the north and south facades for cross ventilation. The centres which are located adjacent to main vehicular road, mostly those located in semi-urban area or adjacent to market places are reported to have noise problem. Within the centre the waiting area is the only place for generating noise and causes disturbance to working staff, especially for general out-patient clinic.

5.2.2.4 Growth and Change:

As these are new type designs functioning for last 4 to 10 years no expansion or growth has taken place. The type designs are conceived as complete buildings and any expansion needed are shown as adding a complete new unit of the same size. Changes in the use of spaces are observed in a large number of the centres.(see Fig.5.37)

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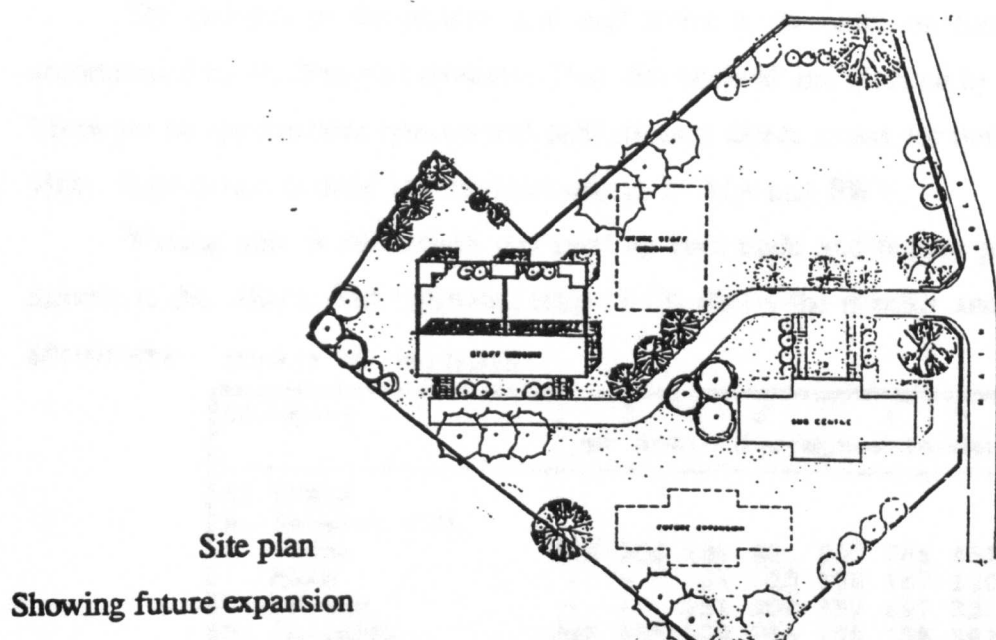


Figure: 5.37 Growth and Change

5.2.3 The health centre services and facilities:

5.2.3.1 General out-patient, MCH, under 5 and F.P. clinics:

There are two main clinics: one run by the MA and the other by FWV. The general out-patient services are provided by MA and Mother and Child (MCH), Under 5 and F.P. services by the FWV.

The centre remains open six days a week, from 9 a.m. to 4 p.m. It was observed from the survey that the opening and closing time varied from centre to centre depending on the arrival and departure time of patients and availability of staff. As one of the staff resides in the adjacent staff quarter, they manipulate the opening time to their advantage. Generally the clinic remains open between 9 am to 2 pm for outpatients, the rest of the time is used for official work, field visit and others. MA and FWV are supposed to go for field visits twice per week.

The most common diseases treated are fever, cold, dysentery, diarrhoea, skin, worm, influenza, whooping cough, malnutrition and ENT.

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The majority of the patients and staff arrive at the clinic on foot. Patients are mostly accompanied by children and relatives. They are received and directed by aya/peon/pharmacist. There are no appointment systems and patients have direct access for both first and subsequent visits. Registration is done in individual clinics by MA and FWV.

Waiting area is centralised and used by both male and female patients. Patients enter directly to the clinics. The following table (5-12) shows the number and categories of patient attendances: NUMBER OF PATIENTS:

Category	1	2	3	4	5	6	7	8	9
	(per month average attendance)								
A: DHAKA									
a. General O.P.									
Total	666	300	232	331	555	766	451	248	440
Male	-	-	51	23	158	167	120	52	-
Female	-	-	181	308	397	599	331	196	-
b. Children	246	120	379	156	195	338	393	226	250
under 1	-	-	69	37	48	91	150	-	-
1 to 5	-	-	310	119	147	247	243	-	-
c. Maternity (Total)	61	84	114	25	24	52	15	106	35
Prenatal	58	-	63	17	22	35	-	95	25
Postnatal	3	-	51	8	2	17	15	11	10
Refer.del.cases	-	-	1	-	1	-	-	-	-
d. Family Planning	125	480	153	92	201	37	19	105	50
e. Immunisation	116	-	-	64	-	106	-	-	-
f. Emergency	-	20/	-	-	-	-	-	-	15/
		yr							yr
Average no. of patient per day:									
A: DHAKA	51	41	36	29	41	54	37	28	33
B: CHITTAGONG	33	23	30	40	36	45	18	12	9
C: KHULNA	35	60	32	56	75	85	35	41	32
D: RAJSHAHI	26	27	42	16	16	30	3	25	21

Note: Break-up out-patient attendance is shown only for Dhaka Division.

LEGENDS: A. Dhaka: 1. Tetuljhura, 2. Shamvupur, 3. Joymontop, 4. Kaijuri, 5. Elenga, 6. Birtara, 7. Kalika Prasad, 8. Pubail, 9. Laxmigonj, B. Chittagong: 1. Fazilpur, 2. Chowara, 3. Shuhilpur, 4. Tamta, 5. Kuakup, 6. Ranihat, 7. Monmukh, 8. Paniundha, 9. Kuchi, C. Khulna: 1. Dariapur, 2. Baradi, 3. Parahati, 4. Mukarimpur, 5. Lebutala, 6. Khazipur, 7. Lebukhali, 8. Jatrapur, 9. Dighalia, D. Rajshahi: 1. Kamarpukur, 2. Subgram, 3. Tetulia, 4. Kishoregari, 5. Ekarachali, 6. Kamat Kajaldighi, 7. Chowgram, 8. Khamar, 9. Varsha.

Table 5-12: Out-patient attendances

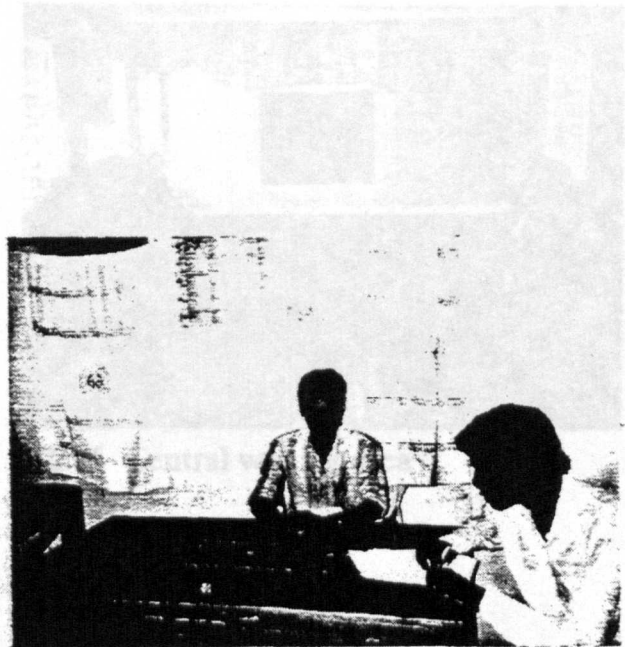
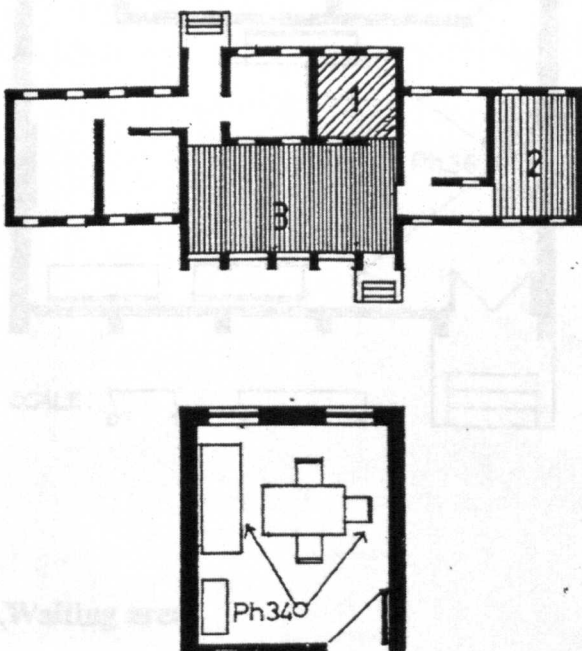
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Physical facilities:(see Fig.5.38)

General out-patient clinic (MA): The clinic is located in front of the central waiting area, adjacent to the pharmacy. The size is around 10.03 sq.m. and comprises of one table, 2 to 4 chairs and occasionally with an examination couch. MAs mentioned that the room is directly visible from central waiting area. Those who have to do the duties of the pharmacist, used a part of the clinic for the storage of medicine.

MCH, Under 5 and F.P. clinics (FWV): The clinic is located at one side of the centre and consists of one table, 3 to 4 chairs, one examination couch. Around 50% of the clinics have height and weight measuring scales. One corner of the room is also used for sterilising equipments and syringes.

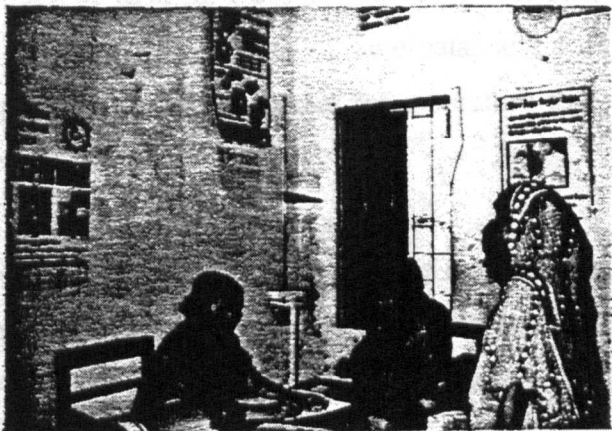
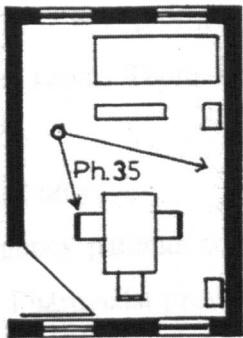
Waiting area: The waiting area is centrally located and directly visible and accessible from outside. This is also used for health education and teaching/ training purposes. A black board is provided on one end wall to facilitate teaching in all UHC. Only around 40% of the clinics had benches for waiting patients, others were found empty.



Ph.34 Less visual privacy for patient's examination

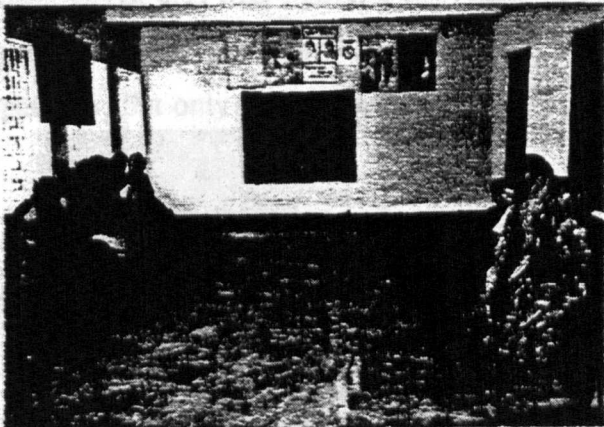
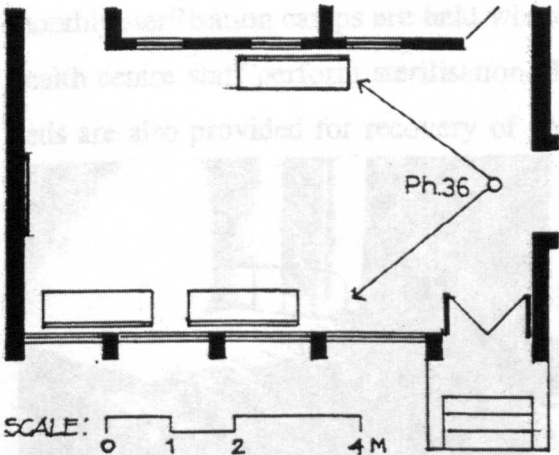
1.General out-patient clinic (MA)

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Ph.35 Female patients waiting inside the F.P. clinic

2.MCH, Under 5 and F.P. clinics (FWV)



Ph.36 Central waiting area

3.Waiting area

Figure 5.38: Clinic and Waiting area

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5.2.3.2 Laboratory:

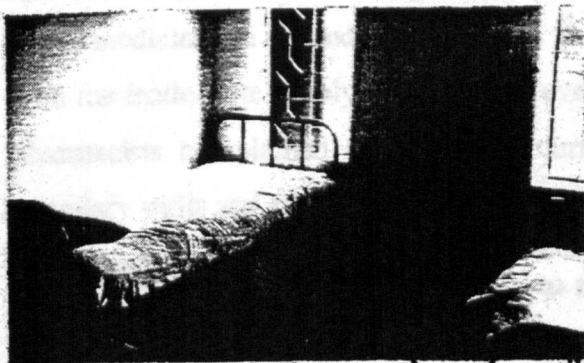
The majority of the health centres were found to have no laboratory facilities. In 17 % of the centres, FWV performed simple laboratory tests (e.g. urine) of ante-natal and F.P. patients in her room. There were no specific arrangement and equipment for laboratory test.

5.2.3.3 Emergency:

Emergency patients are received along with other out-door patients in the waiting area. The MA and Pharmacist provide treatment or first aid in the treatment room. Serious cases are referred to the UHC, only verbally without any specific arrangement. Patient numbers varied between 2 to 20 per month in the sample health centres.

5.2.3.4 Family Planning Sterilization and recovery:

Around 42% of the health centres provide sterilisation and treatment facilities to the F.P. patients. Family Planning operations are done by FWV and MA. In a number of UHFWCs, monthly sterilisation camps are held where staff from UHC(e.g. MO-MCH, FWV) assisted by health centre staff perform sterilisation. The treatment room is used for F.P. operations. Two beds are also provided for recovery of operated patients, but only for day time use.(Fig. 5.39)



Ph.37 Recovery beds - mostly under-utilised

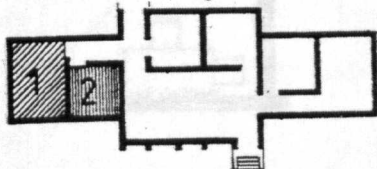
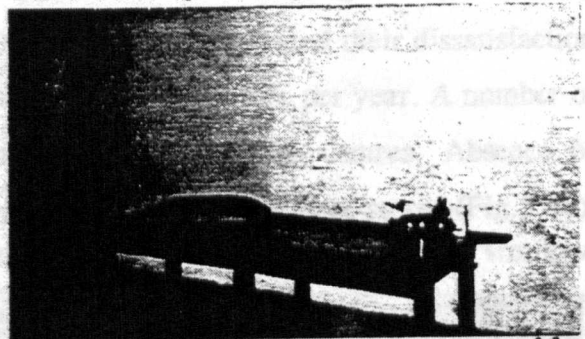
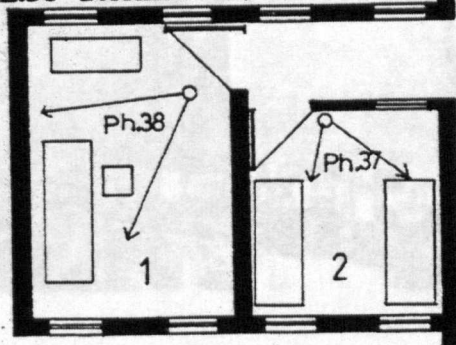


Figure 5.39: Treatment and Recovery(2)



Ph.38 Sterilisation/ Treatment room with couch



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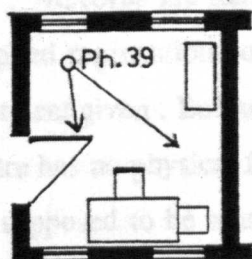
5.2.3.5 Injection and Immunisation:

Injection and Immunisation services for expectant mothers and children were delivered from only 30.5% of the health centres. This service is provided once in a week. Peons generally collect EPI vaccine box from UHC, early in the morning as none of them have storage facilities. Injections are given by FWV in her room. She maintains vaccination card for each patient. At the end of the day a report is sent to the UHC with the remainder of the vaccine.

5.2.3.6 Dispensary:

All the UHFWCs have a dispensary run by a trained pharmacist, where available. In 42% of the health centres MA/FWV were performing these duties due to the lack of staff. The centres receive supply of medicines and drugs in the form of kits from UHCs. These are received, checked, stored, distributed and recorded by the pharmacist.

Medicines, drugs, nutritional supplements and F.P. incentives (money and clothes) are distributed from pharmacy during clinic hours. The dispensary is combined with general store and normally consists of one table for keeping medicines and drugs, 1 to 2 chairs and a cupboard. Storage items were also found to be left on floor and usually do not follow any systematic method. The pharmacist maintains his record for receiving and distributing drugs/medicines in a standard format. In general the pharmacists expressed their dissatisfaction with the inadequate supply of drugs and even the allotted number of kits per year. A number of pharmacists complained against the security problems in these health centres. Absence of boundary walls and night guard are cited as the causes of pilferage from these stores. (Fig.5.40)



Ph.39 Dispensary - patients waiting in front of the window to receive medicine.



Figure 5.40: Dispensary

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5.2.3.7 Health Education:

Health education was found to be an irregular activity. When they have an adequate number of patients in a day, classes are organised in the waiting area. Health education is given only to female patients by FWV and MA. Even during routine clinic hours hardly any attention is given in this area by MA. Only FWV advises pregnant and lactating mothers on nutrition and child care.

It appeared from the survey that health education was not given much emphasis. More attention should be paid to motivate mothers and other family members on nutrition, personal hygiene, sanitation, child care and family planning.

5.2.3.8 Administration and supervision:

The Medical Assistant remains responsible for overall administration of the whole health centre. He supervises the works of the pharmacist, FWV, aya and peon. But the health workers work independently.

The UHFWCs are supposed to be supervised from an upper level, by UFPO, MO (MCH), FPO on a regular basis. But the visits made by them were reported to be very irregular and at a superficial level. The UHC staff reported that a lack of transportation, poor communication and the distribution of responsibility often cause irregular supervision.

5.2.3.9 Record Keeping

Records are maintained for each patient by the MA, FWV and Pharmacist. They use a supplied registration book and record Information like name, age, sex, address, problems and treatment given. But surveillance and monitoring of these records are not done here. The health centre has no physical facilities for central storage and maintenance of the records. The records are supposed to be sent to the UHFPO's office in the UHC.

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5.2.3.10 Teaching and Training:

Teaching and training services are delivered only for Traditional Birth Attendants (TBA). The FWV organises the service once per month. The central waiting area is used for this purpose. Other than one blackboard they have no other arrangements e.g. benches.

5.2.4: Out-reach domicilliary services organised from the centre:

The centre staff, MA, FWV and field level workers are supposed to provide field level services on regular basis. But there appeared to be no such organised schedule maintained by either MA or FWV. Lack of transport arrangement, poor communication are cited as the reasons for non/ irregular attendance. The field workers and their supervisors use the premise for their official work and to organise monthly meetings.

5.2.5 Support Services:

5.2.5.1 Supply:

All supplies come from the UHFPOs office situated in the individual UHCs. Medicines and equipment are supplied in kits on an allotment basis, while drugs and diet supplements are sent 2 to 4 times a year on requisition. These are received by pharmacist (in his absence MA) and stored in the dispensary. The MAs and pharmacists complained against inadequate supply of requisite drugs and medicines. Although the kits are supposed to contain certain number/ amount of drugs and medicines, these are often found inadequate.

5.2.5.2 Disposal:

Disposable items are collected in bins and buckets and disposed of by aya/ peon. These are often dumped at one corner or in the adjacent low land. Disposal from treatment room are burnt or buried as required.

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5.2.5.3 Sterilisation:

Items are sterilised by the FWV in her room. Sterilisation is done in cookers on kerosene stove. The outside tube well is used for cleaning the items.

5.2.5.4 Cleaning:

Almost 75% of the UHFVCs were found in an unclean and uncared for state. The waiting area and treatment and recovery rooms were mostly neglected in terms of cleanliness. The clinics and health workers rooms were found in a better state. Only a small number of centres have back gardens and these are due to the personal initiative of the FWV and the aya. The lack of supervision and negligence of the administrators were the underlying reasons. In addition it was found that a good number of health centres remained closed, even in the office hours. Absence of the administrator often caused reluctance among the cleaners.

5.2.5.5 Linen:

Used linen is either sent to a nearby laundry or washed by the aya within the health centre.

5.2.5.6 Maintenance:

There is no maintenance policy for yearly or regular maintenance of these buildings, equipment and other physical facilities. They are maintained irregularly on ad-hoc basis, especially when severely damaged by flood or other causes.

5.2.6 Community participation:

Community participation is still in a rudimentary stage. Providing health care is regarded as the Governments responsibility. Although committees have been formed to stimulate community participation, but appeared to be less effective. Meetings are organised by Union Chairman, members of Union parishad and UHFVC staff. They discuss on general issues, but other than general discussion, no direct help or means were received from this committee.

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5.2.7 Staff accommodation:

Two staff quarters were provided, one for the FWV and the other for the MA. But in the majority of the health centres, only one of them was found to be residing. The following reasons were identified:

- being located in an isolated area and lack of boundary walls often caused a feeling of insecurity.
- the percentage (40%) deducted from salary as house rent is quite high compared to the rent of locally available houses.
- have own residence within the union.

5.2.8 Significant user's comments:

1. Lack of security:

The security of the entire complex is seriously impaired due to the absence of any boundary or fencing and as 88% of the centres have no night guard. In some cases the Upazilla Chairman took privilege of his status and sold his low priced land which is not suitable for cultivation and away from the Upazilla centre. This promotes certain activities like pilfering equipments from health centre, vandalism and so on. A number of FWVs complained that for this reason they could not stay in the staff quarter and preferred to stay outside. Smugglers in border areas pose problems like storing contraband.

2. Lack of supplies, furniture and equipment:

Though there is a complaint of pilfering equipment, parallel to this exists short supply of equipments as well. In some centres inadequate furniture, even the basics like chair, table, racks, benches caused inefficient functioning of the centres. The situation has been aggravated by existence of age old furniture.

The drug supply administered by UHC is not efficient. Failure of commitment to supply

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and paucity of drugs and medicines are quite frequent. Patients also complained regarding inadequate supply of medicines and drugs. Health centre staff (MA, FWV) and field workers demanded transport arrangement for their field visits.

Unavailability of electricity supply hampered emergency services and also caused security problem. Although in some unions electricity is available and structures have internal wiring and fixtures, they are not given any connection.

3. Location and site:

In some cases the structure is placed below flood level, forgoing the necessity. Every year after flood these buildings need major repair and maintenance for the damage caused. The toilets being located in an open field and detached from the main building ultimately turn into a general public property. It is difficult to maintain these and they become a source of pollution and odour. For this reason many of the staff toilets are kept under lock and key, while patients toilets remain out of order.

The centres which are located within or just beside the village market faced serious problems of privacy and security. Female patients do not feel easy to visit as they have to cross the local market which is a predominantly male domain. The youngsters find it a place of recreation and seriously disturb its function.

4. Individual spaces:

The MA's clinic is directly visible from the main waiting area which causes disturbance and hampers privacy of patients. Lack of privacy has also been observed in the FWVs clinic, especially for physical examination of female patients. As patients can directly enter the clinics, it causes problems for those undergoing examination or explaining individual problem in front of others. Also in the waiting area male and female patients have to share the same space.

The absence of appointment system, late arrival of clinicians and non availability of staff for patient call caused indefinite waiting time for patients.

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5. Administration and supervision, teaching and training:

Irregular or complete lack of supervision from upper levels affects the quality of services and regular attendance of staff. The MAs and FWVs demanded in-service training.

Inadequate members and absence of staff often caused pressure on others to perform their duties. The MA or FWV in a number of facilities were found to perform the duties of pharmacist along with their duties.

6. Changes in the use of spaces:

Less used spaces (e.g. recovery, treatment) in a number of facilities are used for other purposes e.g. staff accommodation, storage of relief goods by Union Chairman, smuggled goods in border areas, other storage.

7. Water supply:

Tube wells which are essential for day to day running of the health centres, were found not in working condition in 40% of the centres.

8. Maintenance:

Once the structure has been built it needs periodic maintenance especially painting, cleaning, sanitary works, tube well and so on.

5.3 Conclusion:

Overall organisation, administration and role of PHC facilities:

Since independence from Pakistan (1971), emphasis has been placed on Primary Health Care providing comprehensive preventive, promotive and curative care particularly to the rural masses. These services are in the process of being provided through the 3 levels (e.g. home and community, union and upazilla) by health workers, one UHFWC/ RDs in each union and one UHC in each upazilla. In reality the existence of different types of facilities (e.g. MCWCs, RDs,

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UHFWCs and UHCs) and dual administration causes confusion among both staff and patients. The Government tries to integrate health and family planning services in these facilities, but there are clearly two separate health and F.P. sections under UHFPO and UFPO with independent staffing members working from UHCs and health centres. The effect is personal distrust among health and family planning workers, duplication and a feeling of lack of responsibility. Inappropriate functional integration of health and family planning at upazilla level and below causes organisational and service delivery problems.

There are altogether 1075 RDs functioning from old/ donated buildings and 2300 UHFWCs constructed after liberation. The policy of providing one UHFWC in each union by 1990 appears to be too ambitious. A large number of UHFWCs were constructed without any proper manpower strategy, supplies policy and maintenance plan. This has also caused duplication of services. Thus MOs and MAs are providing treatment to general outdoor patients from RDs and UHFWCs, even in the same union and field level workers from both sides are serving the same population. With such limited finances, manpower and physical resources such provision is a waste of resources.

In management further confusion exists. The field level workers are accountable to the UHCs instead of respective RDs and UHFWCs. Thus UHFPOs and UFPOs are responsible for administering both health centre and field level staff, which is almost impossible, and results in a reluctance to be supervised.

To provide PHC services appropriate to the patients' needs, there should be a strong link between the different levels of services. The essential requirements are an appropriate referral system and regular supervision. Both of these requirements were found to be lacking.

Referral:

The referral of patients from lower to upper levels is not officially maintained. As patients are free to attend directly any level of facility (e.g. UHC, DH, TH) without referral. The tendency is to go directly to upper levels for what is perceived as better care. As a result of this by-passing, the lower levels of facilities are chronically under-utilised causing

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overcrowding at the upper level of facilities, specially DHs and THs.

Supervision:

Irregular and ineffective supervision at the lower level of facilities from upper levels causes inefficient service delivery. A lack of a proper communications network, transport and delegation of responsibilities are the underlying reasons. Multiple supervision of personnel often causes confusion.

Location, distribution, catchment population and service facilities:

The location of UHFWCs was not given proper consideration compared to UHCs. The UHFWCs are mostly isolated structures lacking proper communication routes and during the rainy season, the seasonal and katcha roads become flooded causing inaccessibility. All-weather communication networks and proper transportation are essential for the movement of patients, staff and supplies. As RDs and UHFWCs are run by different departments, no such account has been given. Thus there are unions which have both RD and UHFWC working side by side and a number which have neither.

There exists a wide variation in catchment population for the same type and size of PHC facilities. This is because the same size and standard type plans were designed to repeat throughout the country without any account of area differences e.g. catchment population and density of population.

Adequate water supplies, drainage and disposal systems, and electricity are essential for day to day running of the facilities. Around 40% of the UHFWCs were found to have an inadequate water supply. Drainage and disposal systems should be improved. Site selection in rural areas need more attention to easy accessibility, flood protection, soil condition, service facilities and suitable relationship to the village community.

There is a felt need for the Government to carry out research and training for medical and architectural planners.

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Services:

Although all the UHCs and UHFWCs are supposed to provide similar packages of services, they do not. Due to the shortage of staff, equipment, supplies and to some extent space a number of PHC services could not be provided from all the facilities e.g. immunisation, F.P. sterilization, radiology, general surgery and so on. PHC facilities should provide preventive, promotive, curative and rehabilitative services. It appeared from the survey that other than regular EPI and as a part of F.P. services, preventive and promotive health services are mostly provided by field workers. No rehabilitation services are provided as such. Inadequate and inefficient surgical procedures often compel patients to attend at the higher level of facilities, thus causing under utilisation of inpatient areas in UHCs and over utilisation of DHs and THs.

Staffing pattern:

Shortage of medical and technical personnel in UHCs (X-Ray, Dental, EPI technicians, RMO, dental surgeon) and UHFWCs (pharmacist) are affecting the efficient service delivery. The attitudes and job satisfaction of staff and provision of amenities are also important to consider. For example the absence of doctors in the UHCs and non residing MA/FWV are both affecting service delivery. Regular and in-service training of staff is essential for both field workers and auxiliary health workers.

Patients:

The out-patient numbers in the UHCs appeared to be much more than the attending doctors could handle. This has resulted in less time being given to consultation and examination. On the other hand the inpatient departments were found to be under- utilised. Also there appeared to be a mismatch between the number of male-female admissions and the number of beds allocated for either sex. Neither did bed provision take care of infectious and communicable diseases and postoperative care. The UHFWCs were mostly under utilised.

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Brief:

Inadequate knowledge of operational policies, activities and sequence of activities resulted in inappropriate space provision and grouping of activity spaces. The following examples of inefficiencies in the UHCs can be cited:

- the sequence of activities, operational procedures and existing staffing patterns demand patients waiting areas to be close to the clinics. But the clinics are mostly away from the waiting areas, facing the main circulation area. Due to the lack of patient call systems, patients wait standing in corridors outside clinic doors disturbing the movement of other patients and staff.

- the F.P. clinics are often located away from the main entrance, and waiting areas

- O.T. in old type plans faces the circulation area used by outdoor patients and staff.

- inappropriate location of delivery rooms, O.T., F.P. clinics, Laboratory in old type designs.

Building layout, organisation and size of spaces:

A wide variation in plinth areas of UHCs is visible. Variation is even greater for room size and shape for similar activity areas e.g. outdoor clinics, X-Ray, laboratory, O.T. All these indicate lack of guidelines and standards for deciding room size, shape and areas as mentioned earlier. No study has been undertaken to determine individual room size, location and inter-space relationship based on activities and sequences of activities. In these designs space is owned and not seen as resource. Single purpose space approach, multi-purpose not much in evidence.

Growth and change:

No actual growth or expansions has occurred in the new type designs of UHCs and UHFWCs. But changes in the use of space has occurred. In the old UHCs buildings have been expanded vertically to accommodate more bed and PHC functions e.g. immunisation, F.P. functions, more outdoor clinics and so on. As PHC services and facilities are added to the old

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type designs, lack of a proper growth plan causes inadequate space provision and inappropriate location. All the plans are designed with closed ended corridor systems. The sites have scope for accommodating future growth and expansion. But this is never utilised due generally to the configuration of the corridors and the "finished" shape of the building.

Segregation of the sexes:

The importance of sex segregation was felt throughout the survey, especially in out-patient waiting, clinics, wards and toilet areas. The new UHCs are designed with separate waiting areas for male and female patients, but the majority are not functioning as intended due to inappropriate location and lack of required staff. While in old UHCs and UHFWCs common waiting areas are provided for them. All the UHCs have separate ward areas for male and female patients in the same floor accessible from a common waiting area. Privacy of patients are not maintained properly. This problem is acute in out-patient consultation, examination, treatment, waiting and ward areas. Lack of security is another major problem. Many things are stolen from the UHFWCs due to the absence of boundary walls.

Maintenance:

Regular maintenance is vital for the smooth running of the facilities. For example the tube wells, toilets and even UHFWC buildings are decaying due to the lack of regular maintenance. While in a number of UHCs expensive X-Ray machines, autoclaves, ambulances and toilets are not functioning for the same reason. A clear maintenance policy including budget allocation and responsibility is essential to develop along with constructing new facilities.

PART TWO

A METHOD FOR PLANNING AND DESIGN

PART TWO: A METHOD FOR PLANNING AND DESIGN

Introduction:

The evaluation and analyses of the existing facilities revealed a multitude of problems which occur at the different levels of decision making, from distribution, site selection to room layout and furniture arrangements. An urgent need was felt to have:

- a clear understanding of roles, responsibilities and functions at the different levels of PHC facility, management and use to avoid duplication of services and to generate optimum utilisation of the limited resources.
- adequate distribution, location and siting of facilities to enhance accessibility and coverage of catchment populations and also to improve the present state of grossly under-utilised facilities.
- facility type and size according to health care need of the community.
- organisation of service provision for optimum use of human and space resources.
- layout suited to the organisation and work flow of the services.
- layouts responsive to growth and change.
- a strategy for primary buildings using enhanced local technology that can be maintained locally.
- room sizes, shapes and locations responsive to user's requirements, sequences of activities and operational policies.

The present method of planning and design of PHC facilities does not possibly meet the user's requirements and present health care needs efficiently. If this current approach is continued without any corrective measures, the same mistakes will take place, the buildings will become obsolete before their time and provide a medical service at a high level of cost both in terms of money and manpower. The work so far done in this field and its outcome/ feedback are not recorded in a logical way which could be beneficial to future planners and designers. No previous attempt has been made to evaluate the functioning facilities to formulate guidance for future. Even similar types of PHC projects are undertaken by different private and public

organisations (e.g. PWD, private consulting firms, donor agencies). An urgent need is felt throughout the evaluation process for a systematic and more rational method. The proposed method will attempt to avoid the mistakes in the past and try to utilise available resources efficiently.

An attempt will be made to develop a systematic method to prepare guidance to overcome the problems identified throughout the study with a hope to generate fresh thoughts and ideas in the field of PHC facilities planning and design. The guidance is for the use of planners, designers and users related to PHC facilities. It will also encourage multi-professional in-put in the process of planning and design, from inception to completion.

The aim and objective of the guidance is to show a pathway/ step by step approach/ method of planning and design of PHC facilities (what to do and how to do it). This should help PHC facility planners, designers and users to understand the underlying problems, principles and procedures. Thus enabling them to make decisions or formulate solutions at each stage of planning and design e.g. preparing project brief, building programme, space organisation and so on.

The guidance will provide the basis for all the planning and programming. In Bangladesh no project can be done on an individual basis due to resource limitation. Thus it is expected to provide basic guidelines which may be shared and distributed among the planners and designers to provide them a common background. This will also be helpful for evaluation of existing facilities, extension or up-gradation of facilities. In this study attempts have been made to provide a comprehensive method from inception to design. The construction and commissioning stages are excluded from the process.

Based on the guidance, subsequent improvements and changes can be incorporated because any changes in policy and resources will affect the building and thus demand changes in guidance. This will also try to save time in the decision making process.

Throughout the process care will be given to make it easily accessible, both the format and content, to the users. It is felt important to state "goals/ objectives" for each decision made. This is also helpful to formulate a concept in the design process.

It is anticipated that the statements on the "existing situation and problems areas identified" in the survey would be useful for the users to understand the reasons behind the suggested decisions. This will also enable the users to assign priorities. The format of decisions derived from check lists will also encourage multi-professional participation in the decision making process.

A "discussion" on important issues, strategies and policies preceding the guidelines will help the users to understand clearly the options available along with suggested method and logic behind selection.

The guidance is presented in two sections. The first section (Chapter Six) deals with planning guidelines and the second one (Chapter Seven) deals with design guidelines. Planning and design strategies are set out as underlying concepts for the proposals before presenting the guidelines. The strategies for limited resources are set out before the planning guidance and for growth, change and use of local material and technology before the design guidance. Chapter Six contains planning guidance covering roles, services, functions, distribution, location and size followed by project brief with outline operational policies, activity analyses, schedule of accommodation and room data. Based on the planning guidelines, the design guidelines in Chapter Seven set out design principles/ building strategies, design concept and form of guidance followed by design proposals.

CHAPTER SIX

A METHOD OF PLANNING PHC FACILITIES

Chapter Six

A METHOD OF PLANNING PHC FACILITIES

6.0 Introduction:

The planning process starts with the following three basic questions:

1. Where are we now ?
2. Where do we want to be ?
3. How do we get there ?

The reviews, analyses and empirical investigations in chapter one to five were made to answer the question one and also prepare a sufficient ground work to set answers to the next two questions.

A systematic planning method is essential to assess priorities among health problems and to select actions required to solve the problems. Regionalised planning has already been adapted as a national strategy for health care delivery emphasising PHC. But there is a need to overcome obstacles as identified in Chapter One and Five for a successful regionalised system. A precise definition of current and future role of existing facilities, services and functions at each level (i.e. primary, secondary, tertiary and specialised) and available resources (money, manpower and facilities) are the essential prerequisite for successful regionalised planning.

Within the framework of roles, services and functions, the organisation of functions and subsequently physical facilities can be determined. In this chapter an attempt has been made to establish a systematic approach to planning, set the above frame work and thus develop an outline project brief for PHC facilities.

The planning guidance is divided into three sections. Section one defines the role, services and functions of different levels of facilities along with planning strategies of limited resources. A general guidance sheet is prepared next on "Distribution, Location and Size" of PHC facilities. The final section deals with project brief with outline operational policies, activity analyses, schedule of accommodation and room data of individual facilities. The sequence of operational policies follow from upper level to lower levels (e.g. UHC, UHFWC and HP). For health post only scope of the facility is outlined as proposed outline operational policy for UHFWC will cover policies for HP. Discussion on planning decisions are prepared

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before guidelines on out-patient and in-patient areas in UHC and UHFWC to help to understand the options available along with suggested method and logic behind selection.

6.1.0 Role, Services And Functions Of The PHC Facilities:

It is essential to develop a clear idea of the role of PHC facilities in health care provision in the community, the services, functions and facilities required in response to needs. Lack of awareness of roles and responsibilities of PHC providers, both staff and facilities, has caused duplication of services. Bangladesh, a country with limited financial, manpower and physical resources can hardly afford such misuse of resources. Thus it is felt important to define roles, responsibilities and functions in response to problems and needs of the community to be served and then assign manpower, building and financial resources to fulfil those needs.

6.1.1 Role of PHC facilities:

Following the Alma-Ata Declaration and adoption of PHC policies, the role of the facilities at the primary level has changed from just curative to promotive, preventive and curative services. Thus the previous Rural Dispensaries and Rural Health Centres (later THCs) are gradually upgraded or replaced with the provision of new UHFWCs and UHCs. Although a certain number of RDs are still providing only curative care.

The following basic tasks are identified for PHC facilities, whose complexity and functional responsibility will rise with the levels of facilities in the referral chain.

1. As a PHC service providers:

As an integral part of the community each level of PHC facilities should provide promotive, preventive and curative services at present and rehabilitative services in future to meet local health needs. Each lower level should get support and back-up services from the next upper level to fulfil the PHC tasks. A close co-operation to be maintained with facilities in the referral chain and other services in the community.

Government has also recognised all the essential objectives to fulfil PHC programme, but the majority remained in the paper plan and are not yet implemented through the facilities. In

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the Fourth Five Year Plan (1990-95) special emphasis has been given to the development of PHC and F.P. infrastructure with the objectives to provide: population programme and family planning services, decentralisation of authority for service delivery, maternal and child health care (MCH), increase accessibility, improve nutritional status, manpower development and training facilities, increase utilisation of facilities, manpower and so on.

To improve the existing situation there is a need to place special stress on improving quality of services, co-ordination between different levels of facilities and man-power, resource distribution and their optimum utilisation.

2. support and enhance referral system

The PHC facilities, being an essential part of the whole/regionalised health care system, should provide services at the door step of patients within the community and refer only those to upper levels according to health needs. The position, responsibility and delegation of authority is important at each level of facility (H.P., UHFWC and UHC) and each category of service providers (field level workers, auxiliary health workers, trained medical staff and so on).

Effectiveness of referral system will depend on the patient's confidence in the different levels of facilities and providers. Being in a systematic referral system each level should have the capability to tackle the problems of referral from lower level and also to refer patients to upper levels as need arises. Also all feasible means should be adopted institutionally to check by-passing facilities e.g. a service similar to lower level within the unit to discourage patients to travel long distance for similar treatment offered. At the same time for referral patients to higher level, there should be adequate provision and quality of services and facilities. For example after referral by UHFWC if a patient still could not get proper treatment at UHC due to the lack of staff, facilities and drugs they will lose confidence in that facility. Available resources should be distributed judiciously which can even be shared among a number of facilities. Attempt should be made to increase the quality of services by providing services by visiting clinicians from UHFWCs to HP, to UHFWCs from UHC and to UHC from DH. This will in effect raise the confidence and utilisation of the present facilities and reduce by-passing phenomena.

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3. teaching and training activities to meet community needs

In service training facility should be provided for the field and auxiliary health workers by staff from UHC and DHs. Training of medical students on community medicine and nurses can be organised from certain UHCs depending on location, facilities and staff available.

Health education programmes need to be organised for staff, patients, visitors and relatives, religious, community and traditional health practitioners. The programmes should address areas of specific health problems and ways and means to remedy those.

The training and educational programmes need to be carried out regularly in a well co-ordinated and well designed way with essential support and supplies.

4. surveillance and monitoring (collecting and collating of demographic and epidemiological data to establish needs and priorities)

It is essential at this level to prepare data base to monitor health status of people which can be incorporated in future planning and programming. Based on the data monitored, future planning and programming will take shape. Monitoring of data can also be done centrally for the whole district. The responsibility of field level workers, individual PHC facilities to collect data on health status of the community, demography and epidemiology, mortality and morbidity in a well organised and standard method will facilitate the surveillance and monitoring function.

5. Encourage community participation and inter-sectoral collaboration

At primary level it is essential to maintain a close link with the community to be served. Without active participation of the community in planning and implementation it is difficult to achieve the desired result. At present this is only limited to certain meetings with community members (e.g. Union and Upazilla Chairman and other officials). They should be given more responsibility through selecting staff from the community, participating in preventive and promotive services, in health education and training programmes and so on. Close links with other local services (e.g. education, improved water supply, sanitation programme, food and so on) also need to be maintained.

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6.1.2 Services and Functions:

The following chart shows services, functions and functional grouping at household, community, union and upazilla levels of facilities.(Fig.6.1)

<p>Village and Ward Level: (4 to 5 villages constitute a ward. Total 13500 wards) Catchment population: Average 7000</p>	<p>Union Level:UHFWC (2 to 3 wards in an union. Total 4500) Catchment population: Average 20000 minimum 15000 maximum 25000</p>	<p>Upazilla Level:UHC (around 10 unions constitute an upazilla. Total 460) Catchment population: Average 200 000 minimum 40 000 maximum 500 000</p>
<p>Services:</p> <p>At the household level:</p> <ul style="list-style-type: none"> - health education on general health, hygiene, nutrition, MCH care, family planning, prevention of communicable diseases, promotion of health activities - distribution of F.P. materials - supervision of pregnant mothers and home delivery by TBAs - data collection 	<p>Services:</p> <ul style="list-style-type: none"> - prevention of diseases, immunisation - promotion of health, health education -screening e.g. identification of complicated delivery cases - MCH and under five care - F.P. services - curative services for general out-patient - teaching and training - emergency services for minor cases -simple diagnostic services e.g. laboratory tests. 	<p>Services:</p> <ul style="list-style-type: none"> - Out-patient services for general out-patient, MCH and under five, FP patients (consultation, examination, treatment, health education, referral to upper level) -emergency services -diagnostic and treatment services (X-Ray, Laboratory, D.T., Delivery, Immunisation) -in-patient services (general male, female, children, maternity, infectious/communicable diseases patients) -support services (supply, disposal, catering, sterilisation, cleaning, maintenance, laundry) -administrative and teaching & training
<p>Staff:</p> <p>1 male worker (HA) 1 female worker (FWV) Community level/satellite clinics/health posts:</p> <ul style="list-style-type: none"> - prevention of diseases, mass immunisation -referral to upper level - basic mother and child health care -sample collection for diagnosis(slides for detecting infectious and communicable diseases) - promotive and health education <p>Staff: Mid level health worker, preferably female e.g. FWV</p>	<p>Staff:</p> <p>MA-1, FWV-1, Pharmacist-1, support staff(aya, peon/guard) Field level workers Later MO-1, Laboratory technician-1</p>	<p>Staff:</p> <p>UHFPD-1, MO-3 to 5, Dental surgeon-1, RMO-1, MA-2, FWV-2, MO(MCH)-1, Pharmacist-1, Lab. technician-2, EPI tech-1, Dental techn-1, Radiogra-1, Staff nurse-5, Ward boy-3, female ward assist-2, cook and masalchi-2, support staff-10, Admini. staff-7 to 10</p>

Figure 6.1:
Services and Functions

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6.2 Planning Strategies - Limited Resources:

Lippsmeier (70) defined the term 'limited resources' as insufficient financial means, a lack of training, skilled workers, material resources as well as incompetent management.

6.2.1 Financial Resources: Building, equipping, running and maintenance cost.

The majority of the PHC projects in Bangladesh in subsequent five year plans from 1976 are constructed on financial assistance from different donor countries and organisations. They mainly supported building construction and supply of equipments while running and maintenance cost rested on the Government yearly budget. The building and equipment standard set at the planning and design stage hardly shows any regard to their running and maintenance capacity. Thus from survey analyses we find that expensive autoclaves became out of order due to the lack of maintenance. In a large proportion of the clinics, X-ray rooms, OT's remained under-utilised due to inadequate or complete absence of staff, equipment and supplies.

The limited financial resources mostly affect the provision of supplies for day to day running of the facilities. This situation has resulted in under supplied, under-utilised and understaffed facilities, ultimately affecting confidence of the users.

Building design, construction material and methods influences construction, running and maintenance costs. Also the appropriate choice of building and finishing materials can reduce construction and maintenance costs. Materials which are less expensive but require large maintenance cost should be avoided e.g. unseasoned timber.

Savings in construction cost through appropriate layout and surface area, building materials and technology can be substantial for projects like PHC facilities. Because these will be constructed in large numbers in future to cover whole of Bangladesh. The planning and design proposals should focus not only on immediate expenditure but also its running and maintenance cost.

6.2.2 Manpower

The available medical and nursing personnel is very poor in Bangladesh, only one doctor

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per 9010 and one nurse per 19400 population. The situation is even more grim for rural areas as the majority of them are concentrated in urban areas. There is also an acute shortage of skilled technical and support staff. The existing training programmes could not fulfil even the sanctioned post to run the facilities.

To train a doctor needs 6 to 7 years and a nurse 3 to 4 years. The limited training facilities, long training time and high cost can hardly fulfil their demand and keep pace with the rapid growth of population. After such a long time and extensive training in urban areas the skilled manpower lose their initiative to work in the rural areas. This fact is evident from the actual number posted and those who are working. A study by Bangladesh Institute of Development Studies (59) also supports this fact. Thus manpower planning should be based on available number, type, training, facilities and also their attitude. Also the posting of one doctor in each Rural Dispensary without any staff accommodation led majority of them to visit the centres infrequently while still based in urban areas.

The programme to introduce less skilled staff/ auxiliary health workers (MA, FWV, TBA, HA, FWA.) taken from the same community and trained within short period has proved to be more effective. They can live in their own area and gain confidence of the local community more easily. But the programme remains deficient in various respects:

- lack of in-service training - undefined role and responsibilities causing duplication of work.
- lack of supervision of their work and their accountability to the staff in the referral chain.

The current health policies also identified the importance of including the traditional practitioners within the system. As most of them work in the rural areas and have already gained confidence of the rural mass, their use can also increase the utilisation of the existing facilities and also support the preventive and promotive programmes.

Thus the aim should be to use available manpower resources as efficiently as possible, using less skilled staff for the work within their capability and reserving more skilled staff for more specialised work.

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6.2.3 Facilities:

Although a large number of building programmes have been undertaken in last 20 years, there is still a general lack of health building resources. The target set in the plan periods could not be fulfilled within the stipulated time. The situation is worsened by the fact, the programme paid little regard to the existing building resources, their distribution and future possibilities. Thus a number of unions have both RD and UHFWC and some others have none. The problems faced in accommodating new services and facilities in the old existing buildings stress the need for flexible planning and design to accommodate such demand for growth and change. Thus the aim should be to utilise the existing facilities better as well as planning and designing new facilities to meet future needs and demands and any changes that may occur in its life time to get best value for money.

Activity space organisation, zoning and circulation system increase or decrease working efficiency and consequently the number of staff.

6.2.4 Management

Appropriate management of limited resources can obtain optimum utilisation of available resources to the benefit of the users. For example,

- equitable distribution of financial resources for building, maintenance and running cost instead of the present approach to increase the number of facilities without prior thought of their maintenance and running expenses.
- use of less skilled staff for work within their capabilities and reserving more skilled staff for more complex work needing specialised training.
- decentralised and efficient distribution of facilities instead of centralised facilities

6.3 Planning Guidelines on Distribution, Location and Size

Sheet. No.PHC/1.1 DISTRIBUTION, LOCATION AND SIZE

DATE

AIMS AND OBJECTIVES:

The objective is to attain complete coverage, equitable distribution of services and size of facilities throughout the country according to the needs of the community to be served. (most basic care closest to where people live and maintain a chain of referral according to health needs of the population.)

The aim is to enhance easy accessibility for the community to be served and also support satisfactory movement of staff, patients and supplies from upper level to lower and vice versa.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- the distribution and size of facilities (UHC, UHFWC) is presently based on the upazilla and union i.e. one 31 bed UHC in each of the rural upazilla (395 in total) and 1 UHFWC of same size in each union (4500) and 1 health post in each ward(12500).
- no account has been taken of variations in catchment population, area and density. But the Upazillas or unions are not identical in size or characteristics.
- population in upazillas varies from 40,000 to 500,000 and in unions from 10,000 to 50,000.
- for example density in areas like Comilla and Bandarban varies widely, as well as their geographical features. The former is reasonably flat with good communication network; the latter has poor communications due to being hilly and mostly inaccessible.
- if equal number and size of facilities are provided for all regions, there is a chance of under utilisation in some regions while over utilisation in others. So there is a need to consider above factors to avoid disparity and inaccessibility.
- for new facilities (e.g. UHFWCs), no account has been given to the existing facilities (e.g. RDs). Thus some unions have both side by side, while a number have none. This not only duplicates the services, but causes under utilisation of the facilities.

GUIDELINES:

Distribution, size and catchment population:

Equitable distribution:

-For equitable distribution decisions should be taken in the light of the problems of the country as a whole. For this it is also important to collect information on existing facilities, their location, type and distribution and find out the areas of disparity. This will help to decide the ways and means to solve the situation.

* Catchment population, area and density:

- the HPs, UHFWCs and UHCs will

be provided at ward, union and upazilla level respectively. But their numbers and size will vary according to catchment population, area and density. It is not feasible to develop individual area specific units, as it will result a large number of different sized units. It is more practical to group areas within a range of population size, area and density and allocate number and size of unit accordingly. For example an upazilla with large area and poor communication may have more than one unit or an upazilla with high population density may have larger unit.(51)

-Location should be in a community with largest population.

Geographical features

-The large areas with less population density may have more units of smaller size, as for areas with geographical barriers e.g. Khulna (dense forests), Rangamati and Bandarban (hilly regions).

-This will help to avoid the risk of under utilisation in certain areas and over utilisation in others.

Location, Communication and transportation

- not necessarily to be placed at the centre of gravity of the catchment area, but rather at the point of most convenient access

Travel distance and Time:

- centres should be located to have an agreed minimum average and maximum distance of the dependent villages; in addition no village or area will be left unserved in the upazilla for UHC, union for UH&FWC and ward for HP.

Also in Bangladesh, the population will continue to grow (2.7% p.a.) and as a result the need for facilities will grow also.

It may be appropriate to delineate 'functional' catchment areas, on the basis of an acceptable walking distance, measured in terms of time spent to reach the facility. (103)

- a fairly central village should be chosen, for those lacking service centre, to minimise av. and max. distance and for easy accessibility.

Centre of activity

-it is also necessary to select a location where the majority of activities occur. e.g. market, school, administrative office. But not within the market place to maintain privacy of patients, safety and security of the centre.

Distribution with respect to other facilities in the referral chain:

- not near any existing facility of similar nature

- easy access to next higher or lower level to facilitate movement of patients, staff and supplies.

Availability of infrastructural and support services: should also be considered e.g. water level, electricity.

Comments/changes from proposed guidelines:

6.4 Project Brief for PHC facilities 6.4.1 Upazilla Health Complex

Sheet No.UHC/1 OUTLINE OPERATIONAL POLICIES - SCOPE

DATE

AIMS AND OBJECTIVES:

The purpose of the UHC is to provide preventive, promotive and curative services for common ailments through health education and consultation, diagnosis and treatment of ambulatory, emergency and domiciliary patients as effectively and efficiently as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- mainly curative services are provided in the UHCs, some preventive services (e.g. immunisation) for children and expectant mothers and promotive services appeared to be the responsibility of some F.P. and field level workers.

- emergency and operating services deal with only minor cases, while major cases are referred to the District Hospital.

GUIDELINES: (Scope)

UHC services and functions:

1. Out-patient services

a. Reception, Waiting, Patient Call and Filtration

b. Record handling

c. Consultation and examination:

i. General out-patient

ii. MCH including under-5

iii. Family planning

iv. Dental

v. Other specialty (e.g. leprosy, where available)

d. Dispensing

e. Health Education

2. Diagnostic and treatment services

a. Injection and Immunisation

b. Laboratory tests

c. X-Ray

d. Emergency

e. Operating (minor surgery and F.P. sterilization)

f. Delivery

3. In-patient services:

General male, female, children, maternity and F.P. patients a. Principal services

i. Admission

ii. Reception and documentation

iii. C/E

iv. Diagnosis and investigation

v. Treatment

b. Hotel services

c. Subsidiary and

d. Support services

e. Staff and patient amenities.

4. Support services

a. Supply, Storage, Distribution and Disposal

b. Cleaning, maintenance, garden., portering and Laundry

c. Catering

d. Equipment sterilisation

g. Staff amenities

5. Administrative, Teaching and training:

Supervision and regular visit to lower level of facilities

Note/ Comments/ Changes from proposed policies:

6.4.1.2 Scale

Sheet No.UHC/2.1

SCALE

DATE

AIMS AND OBJECTIVES:

The purpose is to find out the workload, staffing pattern (category and number) and time table of the individual department/ unit in order to determine the scale of provision. The aim is to utilise available staff and facilities as efficiently as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- shortage of medical, technical and nursing staff.
- data on patients attendance and admissions are not maintained in an order. There was no standard format to record patients data and only 33% of the complexes were found to maintain yearly records of patient data.
- the out-patient and in-patient attendance varied from centre to centre.
- working hour (8 am to 2 pm) and peak hour for out-patients are in general same for the health complexes.

GUIDELINES: (Scale)

a. Out-patient:

Workload: An average of 250 out-patient with seasonal variation.

Staff:

<u>Category of staff</u>	<u>Number</u>
Medical Officer(general medical, surgical, gynaecological)	2
Dental surgeon	1
MO-MCH	1
Medical Assistant	1-2
Family Welfare Visitor	1-2
Receptionist/ clerk	1
Assistant(peon)	2

Working Hours: Saturday to Thursday 8 am to 2 pm, six days a week.

In the absence of comprehensive data on existing and projected workload, a number of calculation principles are suggested in the appendix. 5

b. In-patient:

The total number of beds to be provided should be calculated based on existing utilisation, catchment population, epidemiological trend and resource allocation. Appendix. 5 shows alternative methods of bed calculation.

The grouping of beds will be done based on male-female separation and progressive patient care according to the patients degree of dependency.

Staff: Different categories (e.g. medical, nursing, technical, support..) of staff will provide in-patient services in different ways (e.g. permanent and visiting, direct and indirect). The category and number of staff are as follows (adapted from sanctioned post):

Sheet No.UHC/2.2**SCALE****DATE**

Medical: RMO 1
 MO visiting
Nursing: Nurse 5

Ancillary and support staff: ward boy-3,
aya-2, sweeper-5

Attendants: one per patient

There will be a 24 hour nursing coverage of
the wards split into three shifts: Morning
(7am to 2pm), Evening (2pm to 8pm), Night
(8pm to 7am).

Note/ Comments/ Changes from proposed policies:

6.4.13 Organisation

Dis.Sh.No.UHC/1.1 OUT-PATIENT AREA: A.DISCUSION ON ORGANISATION

1.1 Delegation of responsibility and authority:

Clear delegation of authority, responsibility and accountability of the service providers are essential, not only within the centre but also at different levels of PHC facilities. At present clear separation between health and MCH-F.P. services and staff has caused duplication, conflict and lack of co-ordination among the staff. Strong links and co-ordination between the UHFWC, UHC and DH will enhance the quality of services and training of staff.

1.2 Efficient use of staff:

It is also necessary to distribute responsibility according to skill, so that staff can provide the best service within their assigned workload. Although there are posts for MA, their working responsibility is not clearly set out for UHC. Also, instead of using clerk/assistant, doctors were found to fill up registration book within the limited time (1 to 2 minutes) for consultation and examination of individual patients. Workload of staff needs to be determined clearly beforehand.

1.3 The flow concept:

Patients arriving in large numbers can be dealt with efficiently by a process called 'flow concept' in which patients attend one or more units as needs be. These units will be arranged in a series and need close co-ordination among them.(118) It is possible to identify patient flow from existing patterns and organise spaces accordingly.

1.4 Grouping of activities according to sequences, similarities and users:

In order to perform activities efficiently, similar activities and also users can be grouped so that activities of one group do not conflict with others.e.g. professional staff with patients, non-professional staff with patients.

Similar categories of patients will go through the same process: e.g. maternity patients for ante natal check-up, immunisation of children and maternity cases (pipeline sessions), Consultation/ Examination (C/E) of general out-patient (personal care) and health education for attending MCH and general out-patient (class).

1.5 Filter process:

It is evident from the survey that the majority of the patients come directly to the doctor with common ailments, as in UHFWC. As the doctors have to deal with 10/20 waiting patients(1 to 2 minutes per patient), even within the same C/E room, they can not give proper attention or even examine the patients if needed. On the other hand patients, especially females can not express their problem in front of others or have to wait due to the crowd. If all the patients are filtered through a clinic run by less skilled staff, in this case a Medical Assistant and a Family Welfare Visitor, the workload of doctors can be reduced; their skill can be utilised more efficiently and thus waiting time reduced. The system will also help to deal with by-passing the lower level, an aspect which is hard to eliminate specially for immediate catchment populations. Only referred and emergency cases will have direct access to doctors, others will have to pass through the filter clinic. For its success needs good team effort and good management system.

Dis.Sh.No.UHC/1.2 OUT-PATIENT AREA: A.DISCUSSION ON ORGANISATION

1.6 Standardisation:

Standardisation of procedures, spaces and equipment is suggested for different developing and developed countries (75) as an efficient method. It is needed for adequate functioning and management and also offer flexibility to cope with future demand for growth and change.

1.6.1 Procedure-e.g. dispensing of medicines and drugs and record keeping can be done following a standard procedure. Records in standard format help to keep essential information and monitoring of data. Also common drugs can be pre-packed for easy dispensing.

1.6.2 Space-e.g. multi-purpose consultation and examination room used by different clinics (e.g. general out-patient, MCH, F.P.) instead of tailor made individual clinics has been proved to have a number of advantages.(109, 31) Such as economy, flexibility for different use and inter-changeability, unbroken consultation and examination, growth and change possibilities.

1.7 Registration and record system:

The registration and record system should be as efficient as possible using available staff and time. The aim is to use fewer skilled staff in registration and recording, keeping flow of patients uninterrupted. Use of standard method is recommended for efficient surveillance and monitoring of data and also for evaluation and planning purposes. Use of tally sheet to keep record on diagnosis by MO or Auxiliary health workers have proved to be efficient as against keeping individual patients record.(75)

1.8 Traffic, circulation, security and supervision:

The out-patient department deals with disproportionally large numbers of patients. The majority arrive in a particular period of time (10am to 1pm, six days a week). The patients follow a similar sequence with one or two variations between arrival and departure. To deal with the movement of large numbers of patients, for majority of whom this may be their first visit, a clear and easily recognisable circulation route is essential. Also, crowds within the main circulation area should be avoided to reduce confusion and conflict between the different traffic movements.

1.9 Sex segregation and Privacy (visual and aural):

The religious and socio-cultural needs of Bangladeshi people demand segregation of men from women in different out-patient areas e.g. waiting and clinic areas. It may not be possible in all UHCs to provide separate clinics(medical, dental) due to the availability of medical staff. But it is possible to provide separate provision for female patients at the first contact point to certain extent. For example a filter clinic run by a female health auxiliary (FWV) may be offered for all maternity and F.P. cases. In the case of waiting it is possible to provide separate area which should also take into account the differential rate of utilisation. Privacy of patients should be maintained during waiting, consultation and examination to a different degree e.g. for waiting visual, for consultation and examination both visual and aural.

Dis.Sh. No.UHC/1.3 OUT-PATIENT AREA: A.DISCUSSION ON ORGANISATION

1.10 Growth, Change and Efficient use of space:

"Practice premises which allow for an interchange of activities between spaces, as circumstances demand, are better able to cope with alterations in practice organisation than premises designed around a series of spaces of the minimum area required for each specific activity."(35, p.4)

They are also better value for money. Spaces used for different activities(e.g. consultation, examination, treatment) and different specialties (e.g. general outpatient, MCH, FP, Dental clinics, Immunisation) should be designed with maximum flexibility to allow interchangeable and independent use.

"If the buildings are designed to house only those activities current in the premises they replace, there is the risk that future development may be impeded and distorted by inappropriate accommodation."(17, p.8)

1.11 Flexibility in space utilisation and sharing of spaces:

Use of time table may reveal that certain spaces can be used for other purposes e.g. waiting for teaching and training, C/E for group meeting.

Note/ Comments/ Changes from proposed policies:

6.4.1.4 B Individual Sheets on Organisation of Functions

Sh.No.UHC/3.1.1.A RECEPTION, WAITING, PATIENT CALL & FILTRATION

AIMS AND OBJECTIVES:

To provide obvious and welcoming reception, user responsive waiting and call system to avoid disorder and overcrowding and to minimise waiting time.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

-patients are received by receptionist/ clerk directly for first and subsequent visits, without prior appointment. After initial registration patients are issued a ticket containing patients serial number and respective doctors room number and directed to the clinic.

-waiting area is mostly used as combined for male and female patients and located away from respective clinics. Crowded waiting area with insufficient or without any waiting arrangements (e.g. benches). Patients often wait in-front of the clinic door, crowded within the main circulation area, affecting movement of staff and other patients. Patients were also observed to wait within the clinics preventing privacy for consultation.

-there are no call systems as such, specially during peak hours. Patients have to search for their clinic and directly enter along with other patients. Only where assistant(e.g. peon) is available and waiting patients are less in number, they are called by him from clinic door.

GUIDELINES:(Organisation)

1. Reception and initial registration:

The activities in reception are associated with the personal contact between clerk/ receptionist and patient/ patient's escort after arrival of patient.

-patient may arrive on foot, private or public transport.

-direct access without prior appointment to the UHC will be for first visit and return visits will be decided by clinicians. Patients may also be referred from lower levels.

-patients may be received individually or in a group(mother with children and patients with relatives)

-clerk/receptionist will receive patients, record patient data(serial number, name, sex) and direct general out-patient to MA and MCH and F.P. cases to FWV according to sequence of arrival.

-emergency and referred cases will be given priority and may have direct access to MO.

-guidance to waiting, toilet, source of drinking water and any query will be given.

-during rainy season they may need to wash their feet before entering the clinic.

-supervision of main entrance and waiting area.

2. Waiting and Patient Call:

-main waiting will be centralised with screened male-female separation. There will be arrangements for a smaller group of waiting patients shared among related groups of clinics, emergency, diagnostic and treatment areas.

-attempts should be taken to reduce waiting time. The waiting time can be utilised in learning from display or health education.

Sh.No.UHC/3 1.A RECEPTION, WAITING, PATIENT CALL AND FILTRATION

-patient call system should be based on first come first serve basis. Use of number card or serial number on prescription will help to regulate patient call and the system also need to consider patients literacy level.

-receptionist will help to call patients from waiting to MA and FWVs clinic and peon/ doctors assistant will call patients to a group of MO's clinic.

-patients and escorts should be under constant supervision of receiving staff and assistants while waiting.

-need easy access to clean drinking water and toilet facilities

-health educa. displays in locally digestible manner for teaching patients.

-patients waiting should not be a source of distraction for clinicians and also should not hamper privacy of attending patient undergoing C/E or treatment.

3. Filtration: All patients, except emergency and referred cases will pass through filter clinics run by MA and FWV to treat minor cases and refer those who need C/E by a medical officer.

Note/ Comments/ Changes from proposed policies:

AIMS AND OBJECTIVES:

To keep patients essential and effective records for future reference and planning, within the time and capacity of the available staff and space.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

-record is maintained in individual clinic by either MO or assistant. General information on patient's serial number, sex and name are collected at the reception by receptionist.

-no record storage system for whole department. Family Planning side maintain their own records, separate from health side. The records are intended to be sent to District Hospital for surveillance and monitoring. But the process seemed irregular and no standard process or format is maintained for record handling.

GUIDELINES:(Organisation)

The system should be easy to maintain, requiring minimum staff time and contain only effective and essential information.

-central record storage staffed by clerk.

-records prepared by receptionist, clinic assistants and pharmacist will be collected by peon after certain interval (e.g. monthly record) to central record store.

-record keeper/statistician will sort out and produce required data on standard format and send to district level for surveillance and monitoring.

-patients will be provided with personal record card (major illness, treatment given and other records, for children growth chart) and the clinic will maintain the records essential for surveillance and monitoring of data (e.g. number of new and return patients by age, sex, illness and so on.)

-use of standard format to reduce data collection time and help during compilation and easy retrieval of information and also to reduce unnecessary record storage space.

Note/ Comments/ Changes from proposed policies:

AIMS AND OBJECTIVES:

Consultation, examination and treatment of common ailments to be carried out as effectively and efficiently as possible keeping in view reduced waiting time, patients privacy and quality of care.

The purpose is to provide out-patient consultation, examination services to general male-female, MCH including under 5, dental and any other specialty(relevant to need and priority) and family planning cases.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- all patients are seen as first visit.
- lack of privacy for patients, specially females, during consultation.
- examination of patients rarely done, and hardly possible in the existing system of seeing patients in-front of a number of waiting patients.
- a number of clinics are shared by two doctors, due to lack of space, and adequate C/E maintaining patients privacy is not possible.

GUIDELINES: (Organisation)**i. General out-patient**

For first visit general out-patients will be filtered through MA's clinic. For emergency, referral and subsequent visits(as instructed by MO) patients will have direct access to MO.

-patients will be seen in order of arrival, only emergency cases will get priority.

-consultation and examination of patients, decision for treatment, diagnosis, medication , referral to DH for specialist advise/ treatment and for admission to admission unit of the same UHC will be provided by MOs.

-doctors will write prescription on patients record card and fill up the tally sheet to keep record of treatment given.

-privacy of patients during consultation and examination will be maintained by allowing patients to enter one by one. Escort/ patients relative may accompany patient as required.

A. Ante natal and Post natal:

The consultation and especially examination of patients to be carried out maintaining high degree of privacy.

Activities associated with ante natal and post natal services will be carried out at the filter level by mainly FWV.

- history taking
- physical examination
- weighing

-prescription of vitamin, iron pills, anti malarial drugs and so on.

-providing requisition for simple pathological investigation(e.g. Hb, urine), immunisation and any other diagnostic/ treatment requirements as needed.

-screening (e.g. identification of complicated cases for referral)

-referral of patients to MO-MCH within the complex or to admission unit for admission.

iii. under 5 clinic.iii. Family Planning.

-mothers to be encouraged for post-natal visit if any complication arises after delivery and gradually shifted to under five and family planning clinics.

The referral cases from filter clinic, lower levels of PHC facilities, emergency patients and subsequent attendance as decided by MO will be seen by the MO-MCH. The MO-MCH will provide consultation and examination services, referral to DH for specialist care or to the admission unit, requisition for diagnosis, treatment or investigation and prescribe for drugs/medicine. Patients are supposed to bring their record card having initial records(e.g.history,weight taken by FWV and any test result/report).

B. Under five clinic:

Services will be provided for children, age from birth to five, accompanied by their mothers.

Group treatment of mother and child is preferred as mother can learn from other's problem and due to repetition, the advice would be more effective and also to raise a sense of comparison.

The following activities/ services are identified:

- weighing of children, growth monitoring
- recognition of childhood diseases
- advice on nutrition and hygiene

-dispensing

-injection, immunisation

-treatment

-advice to mother, health education

-supervision of the health of all children under five visiting the clinic.

As for maternity patients, all children under five will be filtered through FWV's clinic for first visit. Referral and emergency cases will be seen by MO-MCH.

C. Family Planning:

Here also high degree of privacy and confidentiality to be maintained during individual consultation and examination. Group activity can be carried out for F.P. advice and health education services. The services should encourage optimum birth interval, target number of children, health of mother and child, attendance of both parents. Patients attending under five, A.N., P.N. will be encouraged to attend F.P. clinics.

Following activities/ services are identified:

-issue of contraceptive preparations and devices

-storage of medicines, vaccine, instruments, equipment and Government provided incentives (i.e. clothes and money)

-data collection and compilation with record section.(An integrated and organised information system is essential for planning and management of Family Planning Programme.)

Note/ Comments/ Changes from proposed policies:

AIMS AND OBJECTIVES:

The objective of the dispensary is to get the right drug to the right patient conveniently and efficiently and to make sure that the patient knows how to use it.(22)

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- medicine is dispensed by pharmacist near entrance/main waiting, mostly from one dispensing point for both males and females
 - acute shortage of drugs and medicine causes dissatisfaction among staff and patients
 - medicine is supplied from the main store on daily basis. Prescription is kept for record keeping and balance sheet preparation.
 - some medicine are prepared in the dispensary.
-

GUIDELINES:(Organisation)

The pharmacist will dispense prescribed drugs during clinic hours. Other than distribution, the rest of the work can be done before or after clinic hours. The following activities/ services are identified:

-medicine and drugs will be received every morning before clinic hours, as in the existing system, from central store. The remaining items will be sent back with records on usage.

-the supply from central store will be received, checked and arranged within dispensary

-issue the prescribed doses in a suitable manner for patients to hold and use them. For example tablets/ capsules in packets of same size is better for distribution and handling.(22)

-prepare requisition for next day and registration/record to send back along with rest of the stock by pharmacist/s.

Records of items received, used and ordered should be maintained for proper management. Some items will be pre-packed and some may need preparation.

Prescribed items will be distributed to male and female patients in separate queue in an orderly manner.

The organisation should follow the flow pattern of patients to prevent unnecessary crowding and waiting time and without hampering traffic movement.

Security and supervision of supplies in the pharmacy is essential to prevent pilferage and ensure proper distribution.

Note/ Comments/ Changes from proposed policies :

AIMS AND OBJECTIVES:

The aim of health education is to alter behaviour where it causes disease.(61) The objective is to provide health education to patient, escort/relatives/visitors and staff, both outside and inside the centre to promote healthy living, utilisation of existing/available services and to prevent diseases.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- irregular service, mostly provided through MCH and F.P. clinics and field level workers.
- except in Bakergonj, mostly takes place either in individual clinic or in the waiting area.

GUIDELINES:**Operational Policies: (Organisation)**

Health education on the need for knowledge on hygiene, nutrition, environmental sanitation, maternal and child health care and family planning should be given priority. It needs to relate to folk tradition and taboos.

-will be provided along with preventive and curative services to both out-patients and in-patients

-health education may be given during individual consultation in different clinics or in a group (mother and children of several families) within clinic hour, for out-patients. For in-patients

throughout their staying in the UHC, either individually or in a group.

-health education in the form of discussion, talks, demonstration and display in the waiting and clinic, in-patient areas.

-provided by health complex staff and visiting staff, within and out-side the complex.

-will be part of training process for trainee staff and PHC service providers(e.g. field workers)

-health education curriculum and devices(e.g. posters, books) will be supplied centrally. Local adjustments will need understanding of beliefs and practices of people.

-providing some practical demonstration within the premise will be encouraged.

Note/ Comments/ Changes from proposed policies:

6.4.1.5 Diagnostic and Treatment

Sheet No.UHC/8 2A INJECTION AND IMMUNISATION

DATE

AIMS AND OBJECTIVES:

The aim is to immunise all children and pregnant mothers who attend the centre and also to provide services at the lower levels (e.g. UHFWC, HP) by the health complex staff (EPI technicians).

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- services are provided to children and expectant mothers from all UHCs under EPI programme
 - injections are given by EPI technicians two days a week from health complex and three days from satellite clinics due to staff shortage.
 - vaccine storage is affected by frequent power failure and low voltage. Inadequate storage in old UHCs.
-

GUIDELINES: (Organisation)

-patients, particularly expectant mothers and children will be provided with an immunisation service on a regular basis. For example two days per week at the beginning, due to staff shortage as the same staff will provide field level services.

-patients will be referred from general out-patient clinics (filter or MOs clinics) in the same UHC or from lower level of facilities.

-EPI technician will receive patients, check patient's card(for subsequent visits) or fill up patients card (for first visit), record it and stamp the card after vaccination is

given and give the card back to the patient and keep record for future reference.

-the staff of UHC will also provide the service at lower levels on regular basis.

-storage of vaccine needs refrigeration and cold box and to be stored in a cool space.

-sterilisation of syringes is necessary before injection and washing of items after use.

-the organisation should facilitate the service to be provided for a large group arriving at a time and need to be processed in a sequence.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

To provide simple routine tests for out-patients, in-patients, emergency patients and collect samples from out-reach facilities and field workers as efficiently as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- all the UHCs have laboratory facility for routine tests (e.g. blood, urine, stools, sputum) and also to detect malaria from slides supplied by field level workers.
 - sample is delivered to the laboratory technician at the laboratory by out-patient and for in-patient by aya/ward boy/sweeper from ward. The result is sent through them to respective MO.
 - the old UHCs lack adequate furniture, equipment and space required for tests.
 - inadequate supply of reagents.
-

GUIDELINES: (Organisation)

-routine laboratory tests of blood, urine, stools and sputum and slides supplied by field workers to detect infectious and communicable diseases, as in the existing system, will be carried out by the laboratory technicians in the laboratory.

-for out patients, samples will be delivered by patients along with the request form from MO/auxiliary worker at the laboratory to laboratory technicians. A clinnet, toilet for sample collection, adjacent to the laboratory may help to collect samples. Blood samples will be collected at the laboratory. For in-patients samples (urine and stools) will be collected and delivered by sweeper from ward to the laboratory. Blood samples will be collected by laboratory technician at patients bedside for non ambulant patients and at the laboratory for ambulant patients. Requisition for tests will be provided by ward nurse.

-test results will be sent to respective doctors through patient /escort for outpatient and through ward boy/aya/nurse for in-patient.

-clear separation between inpatients and outpatients traffic flow will be maintained in sample collection and delivery of results.

-future changes in demographic, epidemiological and staffing patterns and their consequent implications for laboratory services and facilities demand flexible planning.

-easy access for out-patients, in-patients and emergency patients

-samples are potentially infectious. Care will be given in handling and disposal of items for staff.

-the lab staff will be supervised by UHFPO.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

To provide radio-diagnostic facilities for out-patients, in- patients and emergency patients depending on available resources. Facilities might be shared at the initial stage with other UHCs and phased in for future development.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- due to the lack of staff, equipment and supplies (e.g.X-Ray film), only 33.33% of the UHCs surveyed are providing the service.
 - X-ray technician/ radiographer takes X-ray, processes it and sends the report to respective doctor.
 - under-utilised service due to limited supply of X-ray films.
 - no arrangement for waiting, dress change and office space.
 - protection from radiation hazards not taken into account.
-

GUIDELINES: (Organisation)

-centralised service for out-patients, in-patients and emergency patients

-the out-patients, in-patients and emergency patients will be sent to the X-ray room with requisition from respective doctor or nurse (for inpatient).

-the radiographer will take X-Ray, process it and send back to the respective doctor via out-patient /escort, ward assistant /nurse as applicable .

-the report and plate may be supplied on the same day or on a specified day depending on urgency.

-patients may need to wait, change/dress before the actual process.

-the sequence of patient reception, waiting, change/ dress, x-ray taking, processing in dark room and delivery should take into account patient and staff flow.

-safety of staff and patient from radiation hazard should be given priority by proper planning and design of spaces and selection of radiation proof materials.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

To provide a 24 hour per day service and transfer/ referral of major/complicated cases to higher level as efficiently and quickly as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- emergency services are provided from all the health complexes. Only minor cases are seen and complicated cases are referred to nearby DH or TH.
 - no separate M/F treatment area and waiting arrangements. Treatment area is directly accessible from main corridor.
 - inadequate furniture and equipment
 - lack of ambulance services for referral
-

GUIDELINES: (Organisation)

-will provide 24 hour a day, seven days a week service to accident and emergency cases. The services will cover reception, examination, diagnosis/ assessment, treatment and recovery of patients.

-patients may arrive directly, referred from lower level or from out-patient department of the same complex along with attendant/ relatives.

-major accident/ emergency cases requiring major procedures and equipment will be referred to the nearby DH/TH. If ambulance is available in the complex it should be used to transfer patient to the referral hospitals.

-the emergency should have required staff and equipment to deal with the

rest of the cases. Emergency doctor will remain in the complex during out-patient working hour and work on call basis for the rest of the time. The staff accommodation within the site will support such emergency services. Other support staff(e.g.nurse, assistant) will remain to receive patients, by rotation over 24 hours.

-general treatment will take place in the emergency room and minor surgery will take place in the O.T.

-patients requiring observation may use bed in the main ward and those requiring short term recovery may stay in the screened treatment area depending on the availability of bed.

-patients requiring admission will be processed through the emergency.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

To provide services for surgical cases of in-patients, emergency patients and for family planning sterilisation using available staff and equipment and considering reduction of cross-infection, easy flow of staff, patient, sterile items and disposal of infected items.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- only for minor surgical cases and F.P. sterilization.
 - lack of surgeon, anaesthetist and equipment causing under utilisation of existing facilities.
 - no recovery beds, patients are accommodated in general wards.
-

GUIDELINES: (Organisation)

-minor surgery requiring less skilled staff and equipment will be carried out in the operating theatre

-due to lack of anaesthetist and surgeon at this level, simple procedures and less complex measures will be undertaken, at least at the initial stage(e.g. use of local anaesthesia).

-patients will come from general male, female and children's wards and emergency room.

-anaesthesia will take place inside the operating theatre.

-sequence of patient, staff(nurse, doctor, cleaner) movement throughout the whole process should support their efficient flow, and reduce the chance for cross infection.

-zoning of spaces into operating (e.g. theatre and anaesthesia, scrub-up, preparation and exit space), processing and support (e.g. store, sterilisation, disposal) and transition (e.g. reception, post operative, staff change) to facilitate infection control and cleanliness.

-post-operative recovery beds to be provided before transferring to the general ward to prevent infection and ensure better bed utilisation.

-sterilisation will be centralised and shared with other departments.

-the organisation of spaces should take account of future changes in technology, staffing pattern and workload.

-visiting staff(e.g. surgeon) from DH may provide service based on pre-organised schedule.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

The objective of the maternity service is to secure the safety of the mother and child throughout the whole process from ante- natal, delivery and post-natal care.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- only normal deliveries by MO(MCH), FWV, nurse/ midwife
 - sterilisation shared with O.T.
 - old UHCs lack adequate facilities; have no separate maternity ward and delivery room is directly accessible from female ward.
-

GUIDELINES: (Organisation)

-the service will cover preventive, promotive and curative care through early identification of complicated cases requiring operation/ caesarean and their referral to MCWC/DH/TH, safe delivery of normal cases, promotion of health of mother and child, feeding practices and educate the mother for after care at home.

-the services will cover reception, admission, uncomplicated labour and deliveries, referral of complicated cases, observation and recovery of mothers. Provision should also be made for staff(e.g. MO-MCH, FWV, nurse/ midwife, TBA, aya), attendants/relatives, trainees.

-may provide practical training for auxiliary staff (e.g. FWV, TBA).

-constant care and supervision is necessary for labour cases to attain safety of child birth.

-adequate supply of sterile equipment and necessities and their reprocessing and /disposal, as applicable, should be ensured. The sterilisation service will be shared with the O.T.

-general cleanliness and sterility of labour space should be emphasised to reduce the risk of infection.

Notes /Comments /Changes from proposed policies:

1. Bed arrangement within ward:

Before deciding the bed organisation/ arrangement a brief review of available ways of arrangement and their advantages and disadvantages is considered important. There are basically two different ways of arranging beds e.g. 'Nightingale' and 'Rigs' ward. The nightingale wards, mostly used in the existing type designs, are those 'where beds are arranged in rows at right angles to the length of the room with a general circulation area down the centre' (78, p.65). On the other hand in Rigs wards beds are arranged in groups (e.g. 4,6,8...) parallel to the axis of the building, on either side of a central or side corridor. (see figure.6.2)

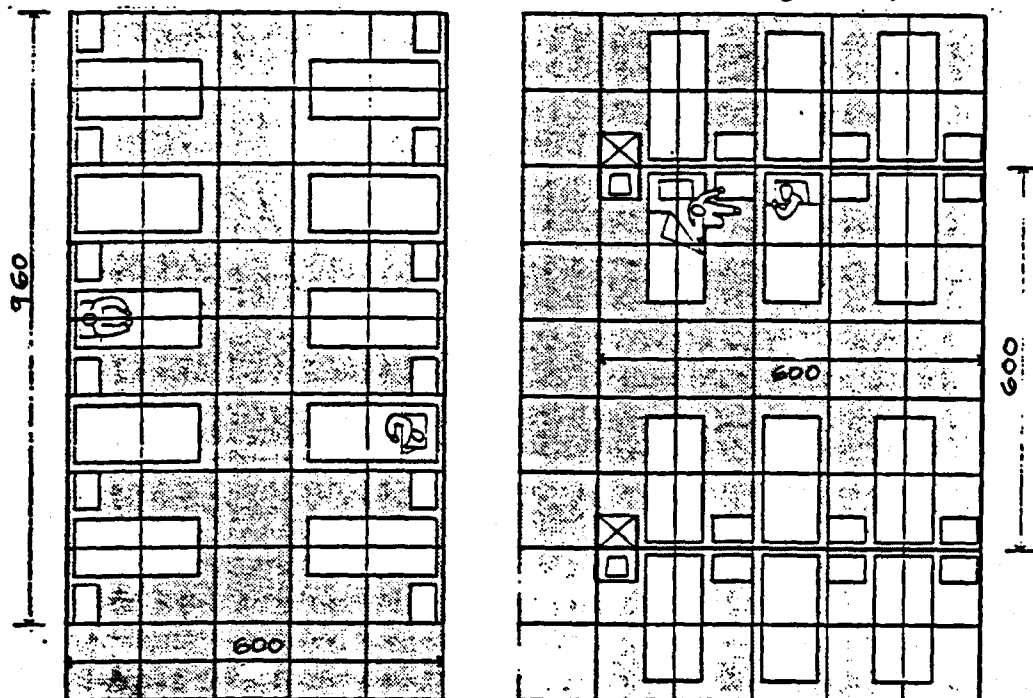


Figure 6.2: Nightingale and Rigs wards, Source: (78)

.Both the arrangements have advantages and disadvantages. The following chart is used to show their advantages and disadvantages and rate accordingly to come to a choice which suit the objectives of in-patient accommodation.

Criteria for selection:

1. Economy: low floor area per bed ratio, narrow building width, inexpensive roof
2. Supervision of whole ward from one position
3. Supervision according to patient's degree of illness.
4. Patients environment (e.g. barrack like for Nightingale and better for smaller groups in Rigs)
5. Patients privacy
6. Glare from opposite walls

7. Flexibility - as to sex differentiation
 - changes in the admission pattern over the year
 - future growth and change
8. Walking distance from Nurse's Station to patients bed
9. Noise level
10. Cross ventilation
11. Locational relationship of patient, nursing, support service and sanitary facilities.
 - Nightingale: 1, 2 and 10
 - Rigs : 3, 4, 5, 6, 7, 8, 9, 11

The Rigs arrangement is chosen as it is considered to offer the desired flexibility to the existing pattern of bed utilisation among male, female and children and their variations in different upazilla and also throughout the year, to secure privacy in smaller groups, to attain best utilisation of available staff and provide care according to degree of illness and improved environment. But care should be given to reduce its disadvantages of increased floor area per bed ratio, building width, less ease in supervision and cross ventilation.

2. Method of bed allocation:

One of the aims for in-patient care is to make the best use of available nursing staff. Patients were found to suffer from different degree of illness, those (e.g. poison, dehydration and surgical cases) who were totally bed ridden needing oxygen and drip and those who could move and take care of themselves. In the present system it is not possible to differentiate between those serious cases needing more supervision and care. Progressive Patient Care is found to be suitable to meet the existing problems by providing care according to the patients degree of illness and uses minimum nursing staff to the benefit of patients. The system has been used by different developed (25). and also suggested for developing countries (51). In this system more serious cases are nearest to the nurses station, and hence can get direct supervision. As relatives stay with the majority of the patients, they can also take part in general supervision, especially for self care patients. For small scale wards in UHCs there may be only two divisions, 'intensive' and 'intermediate and self care'.

The present practice of segregating patients is based on sex, not by specialty. In a small scale ward like this it seems appropriate not to separate by specialty. And also in response to the religious and socio-cultural demand of patients it is also essential to separate male and female patients.

3. Grouping of beds:

Admission records show changes in figures throughout the year and also variations in the ratio of male, female and children in different upazilla and also within the upazillas. In order to enhance the utilisation of beds, such changes in admission patterns for male, female, children, maternity, infectious and communicable diseased patients have to be allowed for. That means the bed numbers should not be fixed for each category throughout the year.

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The need for growth/expansion and change should be taken account of while deciding on in-patient accommodation. The history of development already showed how 10 bed RHC converted to 25 bed THC and later to 31 bed UHC. The changes in use of existing wards also needs due attention.

As discussed in the earlier sections on bed arrangement and their methods the following study is made to look at the alternative ways of arranging available beds:(data based on the survey results)

Total bed = 31.

The following bed numbers are calculated using proportion of admissions for male, female and children. It is accepted that the choice of arrangement will also take account of method of building construction, material and environment during design development.

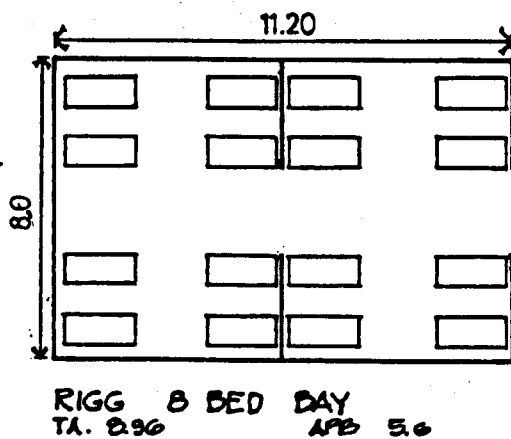
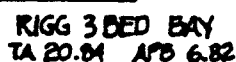
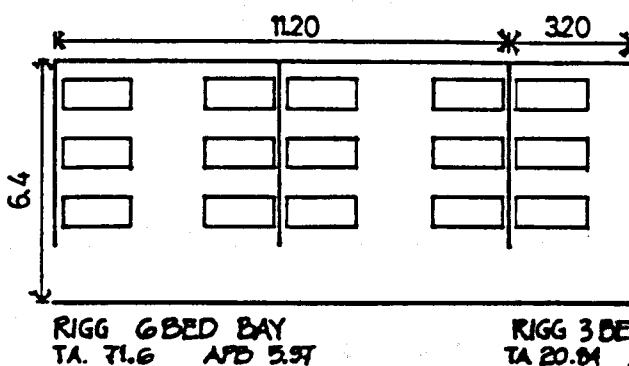
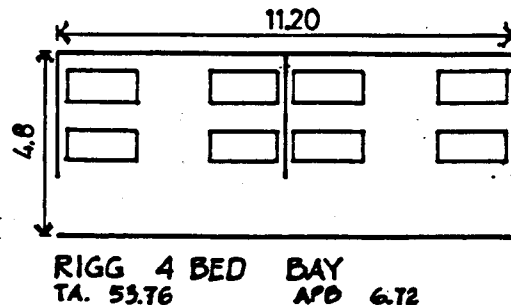
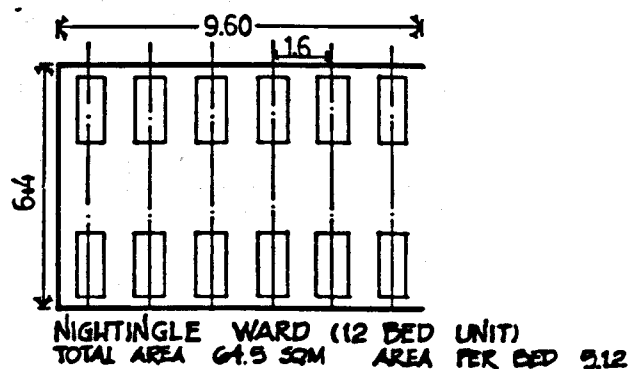
Male (general and infectious/communicable disease.) = 49% of 31=15 (av.), 13(min), 19 (max).

Female, Children and Maternity= 52% of 31=16 (av.), 12 (min), 18 (max.)

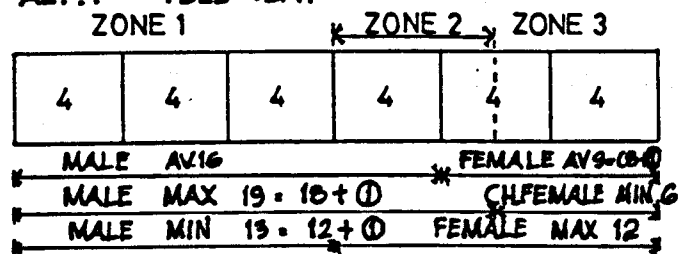
Children = 9% of 31 = 2.75 = 3 (approx.)

Infectious (male)= 2 to 3 (seasonal variation)

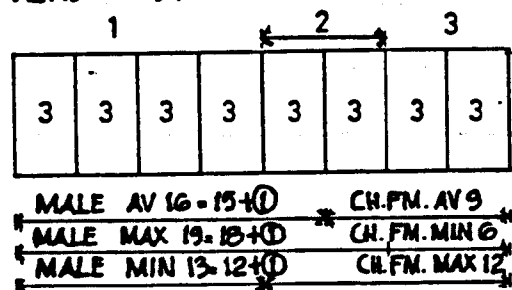
It is to be noted that as the majority of the children stay with mothers, any changes in proportion between females and children can be easily accommodated within their bed bays. Similarly in case of need maternity cases can share female beds. The following figures(6.3) are used to show the alternative ways of arrangement.



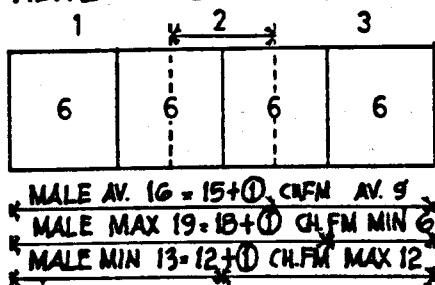
TOTAL 31 MATERNITY 6 GENERAL MFC 25
MALE AV 16 MAX 19 MIN 13
FEMALE AV 15 MAX 18 MIN 12
CH+MAT AV 9 MAX 12 MIN 6 (WITHOUT MAT)
ALT:1 1 BED DAY



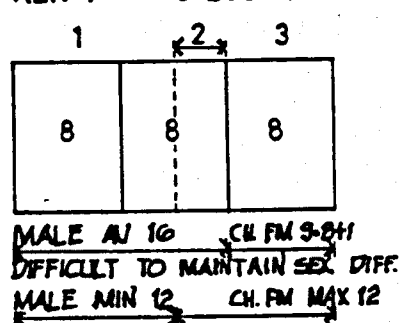
ALT:3 3 BED DAYS



ALT:2 6 BED DAY



ALT:4 8 BED DAY



NOTE: ZONE 1 - FIXED FOR MALES
" 3 - " FEM. & CHILD.
" 2 - FLEXIBLE ZONE

Figure 6.3 Alternative Ways of Bed Arrangement

4. Shared facilities: It is more economical to provide certain facilities shared by the wards. e.g. pantry, treatment, store, clean and dirty utility.

6.4.1.6 B Organisation of Functions

Sheet No.UHC/14.1 3 IN-PATIENT ACCOMMODATION

DATE

AIMS AND OBJECTIVES:

1. To keep patients in conditions which will enable diagnosis, treatment and rehabilitation to be carried out with the minimum distress and pain and with the maximum economy, comfort and speed.(47)
2. To make the best use of limited available nursing staff and beds to the benefit of patients and according to the patients nursing need.
3. Adequate supervision according to patients degree of illness.
4. To attain best possible relationship among patients accommodation, diagnostic, treatment, nurses work station and other support services.
5. Maintaining privacy of in-patients and other requirements in response to socio-cultural and religious need.
6. Flexible to accommodate changes in medical and nursing requirements and expansion possibilities.
7. Reduce the risk of cross infection and achieve safety, security and healthy environment within in-patient area.

EXISTING SITUATION AND PROBLEM AREAS IDENTIFIED:

According to the Government programme there will be one 31 bed UHC in each upazilla with average population of 200,000 (range: 40,000 to 450,000). Among the beds 25 will be for general male, female and children and 6 for maternity patients.

The survey of the 12 UHCs revealed the following facts:

1. Although the official records showed 31 bed in each UHCs, 80% of the old health complexes are functioning with 25 beds. The 6 maternity beds are not provided from these complexes.

2. The majority of the UHCs have three wards: one for the males (av.13 beds), one for females and children (av. 12 beds) and 6 for maternity cases (mostly in new type designs). The number of beds for each sex also varied in different UHC. e.g. Males (min. = 8, max. =16), Females and Children (min. = 10, max. = 15), Maternity (min.=4, max. = 6).Children are generally accommodated within the female ward. Exceptional cases: In Raojan there is a separate children ward with 11 Beds. Allocation of beds are based on sex, not by specialty.

3. no bed provision for infectious, communicable diseased patients and post-operative cases, often accommodated in waiting, maternity beds, general wards and on floor in the post-operative rooms (in new type designs). 42% of the health complexes kept infectious and communicable (e.g. diarrhoea, tuberculosis) diseased patients in converted areas.

Bhaluka: one of the waiting area converted to infectious disease ward with two beds.

Shibpur: post natal ward used for them with 3 beds.

Goalandaghat, Kolaroa and Iswardi: one ward attached to male ward with 3 beds.

4. The male, female and children wards are arranged in open nightingale type of wards.

5. The admission of female and children are more compared to the males but the bed provision is reverse.

6. patients are supervised by nurse and attendants.

7. nurses work in three shifts: from 7am to 2 pm (max.2 nurses), 2pm to 8pm (1 nurse) and 8pm to 7am (1 nurse). One nurse often have to supervise three wards.

8. nurses often work from one station, mostly lack visual contact with patients from the station. Store, nurses room, doctors room, staff toilet often shared between the two main wards. Sanitary facility for patients are at one end of the ward.

9. no facility provided for patients attendants

10.in old type the delivery room is directly accessible from female ward. Toilet is also visible from certain beds.

11.no separate dirty utility, often shared with clean utility.

GUIDELINES: (Organisation)

A. Principal Functions:

i. Admission: Patients will be admitted to the wards through admission unit in emergency area as an emergency patient, booked admission or referred from OPD and other health facilities in the referral chain.

ii. Reception and Documentation: Patients will be first received and admission related documentation done by charge doctor/ nurse at the admission unit in emergency area. Patient will next be received at ward nurse station and h/her medical and nursing related records documented by nurse in-charge.

Medical Record: Patients case files will be kept in the nursing base and patients charts will be kept at the foot of their beds. After patient discharge records will be sent to central record section.

iii. Consultation and examination: C/E between patient and doctor and/ nurse will be carried out at patients bed side. The doctor will prescribe and instruct nurse regarding diagnosis, treatment, medication and monitoring of patients condition and the nurse will organise/ carry out instructions accordingly.

iv. Diagnosis and investigation: blood sample will be taken by laboratory technician at patients bed side for non ambulant patients and at the laboratory for

ambulant patients. Stool and urine sample will be collected at ward level and sent to the laboratory by sweeper. Patients will be sent for radio-diagnostic investigation on trolley/ stretcher / wheel chair (as available) or on foot assisted by ward boy/ aya. Requisition for tests/ investigations will be provided by ward nurse.

v. Treatment: high dependency patients will receive treatment at bed side and medium and low dependency patients in a shared ward treatment area.

vi. Hotel Services:

a. Sleeping/ bed accommodation: male-female segregation for privacy and progressive patient care for better care and staff utilisation should be achieved in bed organisation. Other considerations should be patients comfort, easy supervision, efficient bedside C/E and treatment, accommodation of patients essential and personal belongings and adequate environment(e.g. light, ventilation, noise level).

b. Meals: breakfast, lunch and dinner supplied from central kitchen, distributed in ward (shared) pantry onto individual plates and served by aya/ ward boy under nurse's supervision. The ward nurse will send

requisition for normal and diet meals as per patients requirement one day before.

Patient's attendant can bring food and warm in the pantry, depending on availability of cooker. Empty plates will be collected by aya/ward boy and taken to kitchen.

c. Sanitary Facilities: Shower, w.c. and wash basin considering accessibility, maintenance and religious beliefs. From religious point of view separate toilet for men and women and orientation of w.c. avoiding west facing need to be considered.

d. Patients attendants and visitors: one attendant will be allowed to stay with the patient with necessary arrangement (e.g. sanitary facility, eating and so on).

vii. Discharge: Patients will preferably be discharged by their respective doctor. The necessary paper work and arrangements will be done by ward nurse.

B. Subsidiary Functions:

1. Teaching and training: for medical students on community medicine will be provided from a limited number of UHCs. Teaching and training facilities will be provided for junior nurses, midwives and FWVs in in-patient area, at bed side or in a shared space.

2. Health Education: for staff and patients will be organised on a programme basis and throughout the whole process of patient care.

C. Support Functions:

1. Supply and storage:

Linen: New linen(e.g. bed sheet, pillow cover, blanket) will be supplied from central store on requisition from ward nurse; washed linen sent by ward assistant to clean utility/ store, on regular basis (2-3

times/week). Patients can bring their own linen.

Sterile items and pharmaceuticals: Sterile items and pharmaceuticals will be supplied on weekly basis(2 to 3 times) according to ward sister's requisition from central sterile and store respectively to C.U./store. If needed emergency supplies can be received from the same areas on request. Ward nurse will be responsible to receive, check, arrange and store.

Other items: Other stock items such as stationery will be supplied by topping up system. Oxygen cylinder will be stored near ward area for accessibility.

Store: all clean items will be stored in C.U. room and disposable, dirty and infected items in D.U. room.

2. Disposal and reprocessing:

All dirty utilities(e.g. soiled linen, dressings, sharps, dirty instruments, household waste) will be temporarily held in D.U. in different plastic coloured bags and covered bins. These will be removed by sweeper/ ward assistant (1-2 times/day) to central bin for disposal or to sterilisation area for reprocessing as needed. Dirty linen sent back for washing or disposal if needed.

3. Cleaning/ Domestic service:

Cleaning of the in-patient area including sanitary facilities will be carried out twice per day by sweeper, supervised by ward sister. Cleaning materials will be stored in the cleaners room (shared). Supervision from administrative level is also necessary. Portering will be done by ward assistant and other ancillary staff(peon, guard), as required.

Patient Amenities:

- a. meeting relatives and visitors
- b. storage of patients personal belongings.
- c. prayer in a central space or at bed side.
- d. privacy of patients will be maintained by male/female segregation, smaller grouping of patients and screened/separate treatment area.

Staff Amenities:

- a.Nursing Staff Base- a centrally located staff base will be the centre of nursing activities in the wards.
- b.Doctors Office - shared by RMO and other visiting doctors for writing notes, prescription, meeting staff, patients or relatives for instruction and /consultation.

c.Sanitary and changing facilities for staff on duty-shared

d.Ward pantry can be used for preparing tea, snacks or warming food brought from outside/ home for staff.

Other:

a.Safety and security: of staff and patient following whole health complex policy.

b.Infection Control: according to whole health complex policy.

Notes /Comments /Changes from proposed policies:

6.4.1.7 Support and Services

Sh. No.UHC/15 4.A SUPPLY, STORAGE AND DISTRIBUTION AND DISPOSAL

AIMS AND OBJECTIVES:

The aim is to provide an adequate supply, of secure storage and distribution of essential items and their efficient management ensuring right supply at right point at right condition.

The objective is to enhance a healthy environment and reduce the risk of infection and health hazards through proper disposal of waste.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

-supply of items (e.g. medical equipment, drugs, medicines,...) from DRS, after certain interval (2-4 times/year) and on requisition, to the central store and distributed to individual department. Frequency of distribution varies according to item. Family Planning side have separate store.

-inadequate supply and storage system hampers efficient functioning of the complex and encourages under utilisation of services and skilled manpower.

-wastes are disposed of in bins/ buckets, collected and disposed of at one corner of the site/ outside the premise by sweeper. Some are incinerated if required. No specific care is taken for disposals from O.T., delivery or emergency treatment room.

GUIDELINES: (Organisation)

Supply, Storage and Distribution:

-supplied items (e.g. drugs, medicine, linen, equipment, stationary, F.P. items and incentives and so on) will be received from DRS office on requisition or regular interval based on the items of supply and their rate of use.

-central storage and distribution for all items. But for easy handling, record keeping and accountability to specific department/area division can be made within the centralised storage system e.g. drugs and medicine; F.P. items and incentives; inflammable items and so on.

-the items will be checked, stored and distributed on requisition or regular basis to different areas within the complex by storekeeper with the help of assistants(e.g. peon, ward boy).

-record should be kept on each item ordered, supplied and distributed following a systematic

method. Use of standard format may help in this respect

-adequate supervision to check pilferage, proper storing, cleanliness and record keeping is necessary.

Disposal

-separate items for disposal e.g. general disposal, burning

-burning infected items from O.T., delivery, treatment or other areas under supervision.

-any broken syringes and needles should be crushed and disposed with care

-temporary storage of disposals in covered bin in noticeable space before collection by sweeper.

-disposals should not be dumped within the health complex premise to avoid it to become a fly nuisance source and spread diseases.

-reused items should be separated from disposals for sterilisation or reprocessing e.g. linen, instruments.

Notes /Comments /Changes from proposed policies:

**Sh. No. UHC/16 4.B CLEANING, GARDENING, PORTERING,
MAINTENANCE AND LAUNDRY:**

DATE

AIMS AND OBJECTIVES:

As an example and educator of health care in the community and for efficient functioning, the aim is to keep the centre clean, well maintained, both inside and out.

Easy flow of supplies, records and disposal from outside to inside, and from inside to outside the complex without hampering other activities.

Regular washing and distribution of clean linen to wards and other areas as required to support general cleanliness and infection control.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- cleaning done by sweeper using a wet mop, 1-2 times a day and for O.T. and Delivery room before operation/ delivery.

- regular cleaning and gardening depends on personal initiative and supervision of the administrator.

- no maintenance policy for yearly maintenance or preventive maintenance from central department (e.g. PWD), all done on 'ad-hoc' basis.

- no allocated post only for portering, done by peon or guard.

- linen is washed outside by washerman, delivered to central/ward store. Linen is not changed regularly, one sheet per bed is supplied for long stay and shared for short stay patients.

GUIDELINES: (Organisation)

Cleaning, gardening and portering:

- a high standard of cleanliness should be maintained to minimise the risk of cross infection and to set an example of health education for patients to be followed in their own homes.

- cleaning will be done at regular times without affecting the activities of the area. Most of the cleaning work(floors, part walls, toilets) will be done by sweepers and others(furniture, glass) will be done by assistants(peon, ward boy, aya).

- supervision of work is essential condition for cleanliness of the whole complex.

- frequency and system of cleaning will vary for sterile areas(e.g. O.T., treatment, delivery) to prevent infection.

- storage of cleaning materials and areas for washing mops should be accessible to the cleaners and shared for whole complex.

- gardening within the premise will be done by gardener, supervised by administrator, will support healthy atmosphere and set example for patients.

- responsibility for portering (delivery of goods/supplies from outside to inside/store, distribution to individual areas and so on) should be assigned to particular staff (e.g.peon/). Supervision is also necessary to carry out the works assigned to them.

- maintenance or preventive maintenance to be done regularly(e.g. every year or as required) by central authority.

**Sh. No. UHC/16 4.B CLEANING, GARDENING, PORTERING,
MAINTENANCE AND LAUNDRY:**

DATE

Laundry:

-linen will be washed outside the premise, as in the existing UHCs, by washerman at regular intervals.

-temporary separate storage of dirty and clean linen at ward level will be shared among wards.

-regular changing of linen, storing and sending for wash will be the responsibility of ward nurse

-new linens will be supplied from main store on requisition sent by ward nurse

-linen from other areas will be sent to a central collection point (shared) for washing.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

The aim is to provide catering services for in-patients as efficiently as possible with adequate and efficient system for receiving supplies, storage, preparation, cooking, serving, collecting, washing and disposal of waste.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- patients are provided with 3 meals (breakfast, lunch and dinner) from central kitchen organised by private contractor.
 - every morning the nurse requests normal and/ or special diets from the cook. Cooked foods served in bowls in the kitchen/ pantry, taken to entrance lobby of wards, distributed on individual plates and to the patients by aya/ ward boy under the supervision of the nurse.
 - cooking done on wood fires. No proper storage of bulk fire woods bought from local market and stored either in pantry or kitchen.
 - supply of perishable items on daily basis and non-perishable items as a bulk.
 - majority of the kitchens were dirty due to the lack of proper storage, preparation, washing area, ventilation and personal management.
-

GUIDELINES: (Organisation)

-patients will be supplied with food three times(breakfast, lunch and dinner) a day from central kitchen run by private contractor as in the existing system.

-supplies (perishable and non perishable) will be received and stored. Preparation, cooking, serving, collection of plates, washing and disposal of wastes should follow the sequence of activities.

-cooked food will be served on bowls, taken to the ward pantry, distributed on individual plates by cook/masalchi/ward assistant(aya,

ward boy) and served to patients by ward assistant. Food will be served warm.

-cleanliness of cooking, preparation, store, pantry and washing areas to maintain a healthy atmosphere and to set an example for patients. This particularly need adequate and regular supervision.

-standard of hygiene to be maintained e.g. washing in hot water, proper storage and food serving space, daily cleaning of kitchen area and maintenance.

-firewood should be stored in secure shed.

Notes /Comments /Changes from proposed policies:

AIMS AND OBJECTIVES:

The aim of sterilisation is to kill dangerous organisms and so reduce infection risks as much as possible. The sterilisation procedure should be simple, effective and reliable.

Sterilisation of equipment and other items needed for operation, delivery and treatment services for the whole complex to be provided effectively and reliably and with adequate management and maintenance.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- centralised sterilisation of items (surgical equipment, linen, gloves) for general surgery, delivery, treatment and F.P sterilisation.
 - the whole process run by O.T. nurse before any operation/delivery.
 - lack of maintenance caused break down of a number of sterilisers/ autoclave machines.
 - inadequate sterilisation and washing area.
-

GUIDELINES: (Organisation)

-centralised sterilisation facility, shared by O.T., delivery, treatment and other department as required.

-washing of items for sterilisation, drying, careful storing and sterilising need to be supervised by a qualified staff, in this case O.T. nurse/ FWV assisted by aya/ward boy.

-clean and dirty as well as sterile and unsterile items need to be separated. Thus storage of clean items should be away from washing area to avoid contamination.

-close relation between sterilisation and operating theatre need to be maintained to avoid delay in case of emergency need.

Notes /Comments /Changes from proposed policies:

6.4.1.8 Administrative Services

Sh.No.UHC/19 1.F SUPERVISION AND REGULAR VISIT TO LOWER LEVEL OF FACILITIES SUPERVISION AND VISITS TO UHC FROM UPPER LEVEL:

DATE

AIMS AND OBJECTIVES:

The aim is to improve the quality of services by regular supervision of facilities from upper levels.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- no such regular visits are organised from UHC.
 - immunisation services and F.P. sterilisation monthly camp is provided from a number of health complexes.
-

GUIDELINES:

Operational Policies: (Organisation)

enhancing the quality of services at the lower level.

To provide supervision and regular visit by UHC staff to the lower level facilities (e.g. UHFWC) for out-patient service, treatment, teaching and training and also for

Similarly staff from upper level will provide supervision, clinic services, treatment, teaching and training to UHC on regular interval.

Notes /Comments /Changes from proposed policies:

6.4.1.9 Management

Sheet No.UHC/20 **MANAGEMENT:**

DATE

AIMS AND OBJECTIVES:

The aim of management will be the best use of available staff and facilities to the benefit of patients and users. The purpose is to provide proper management and administrative structure so that there will be clear delegation of authority and responsibilities and to avoid duplication of work, chaos, confusion and distrust among staff members.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- although it is envisaged in the health plan to integrate health and family planning services in these facilities, there are clearly two separate sections under UHFPO and UFPO with independent staffing members.
 - the effect is personal distrust, duplication and a feeling of lack of responsibility.
 - the UHFPO and UFPO are responsible for respective staff in the UHC, RD, UHFWC and also field level staff, which caused inefficient supervision and reluctance on the part of the administrators.
 - lack of team approach in the overall management of health manpower and services.
-

GUIDELINES: (Management)

The UHFPO will be responsible for overall administration and management of the whole UHC. The in-charge of individual departments/ functional areas (Out-patient, In-patient, X-Ray, Laboratory and so on) will be responsible for their own area and accountable to the UHFPO. A close co-ordination will be maintained with immediate lower and upper levels in terms of supervision, sending and receiving staff for service delivery and support services.

Resident Medical Officer will be responsible for medical care of all in-patients. Other doctors will visit for respective patients on daily round and required visits. The senior ward sister will be in-charge of nursing staff and their duties and follow up the instructions given by doctors. They will keep contact with technical and administrative staff and also organise and supervise the work of support staff (e.g. ward-boy, aya, sweeper, cook/masalchi).

Notes /Comments /Changes from proposed policies:

6.4.2 UHFWC and HP 6.4.2.1 Outline Operational Policies - Scope

Sheet No. UHFWC/1 OUTLINE OPERATIONAL POLICIES: SCOPE

DATE

AIMS AND OBJECTIVES:

The purpose of the health centre is to provide simple preventive, promotive and curative services through health education, consultation, examination and treatment of ambulatory and certain emergency patients as effectively and efficiently as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- preventive and promotive services are not adequately provided in the FWCs and totally absent in the RDs.
- immunisation services are not provided from all the centres
- health education is also provided irregularly.

GUIDELINES: (Scope)

A. Principal Functions:

1. Reception, Waiting and Patient Call
2. Record handling
3. Consultation and examination:
 - a. Ante natal and postnatal
 - b. Under 5
 - c. Family Planning
4. Consultation and examination of general out-patients
5. Simple laboratory tests
6. Treatment and Recovery, Immunisation, Sterilization
7. Dispensing

8. Health Education

9. As a base for outreach/domiciliary services
- a. School health
 - b. Health education
 - c. Communicable disease control and environmental sanitation

B. Subsidiary Functions:

1. Teaching and training

C. Support functions:

1. Equipment sterilisation
2. Supply, Storage, Distribution and Disposal
3. Cleaning, maintenance, gardening and portering and Laundry
4. Staff amenities

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

The purpose of the health post is to provide preventive, promotive and simple curative services through health education, consultation, examination and treatment of ambulatory patients, especially mothers, children under five and family planning cases, as effectively and efficiently as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- under the strategies of third five year plan it is envisaged to provide one health post in each ward with an average population of 7000.
 - the PHC services at this level will be delivered by mid-level health man-power.
 - at present satellite clinics and EPI centres are providing these services by visiting staff from UHFWCs and UHCs.
-

GUIDELINES: (Scope)**A. Principal Functions:**

1. Reception, Waiting and Patient Call
2. Registration and Record handling
3. Consultation and examination MCH, Under-five, Family Planning and general out-patient.
4. Immunisation
5. Dispensing
6. Health Education and promotion
7. organising outreach/domiciliary services

B. Subsidiary function

1. Referral

C. Support function

1. Equipment sterilisation
 2. Supply, Storage, Distribution and Disposal
 3. Cleaning, Maintenance, Gardening and Portering and Laundry
 4. Staff amenities
-

Note/ Comments/ Changes from proposed guidelines:

6.4.2.2 Scale

Sheet No. UHFWC/2 SCALE

DATE

AIMS AND OBJECTIVES:

The purpose is to find out the workload, staffing pattern (category and number) and time table of the unit in order to determine the scale of provision. The aim is to utilise available staff and facilities as efficiently as possible.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- the patient attendance varied from centre to centre (e.g. max 100, min 2 per day)
- shortage of staff, especially pharmacist (42%) and support staff.
- unreliable data on patients attendance as identified from informal discussion.
- working hour (9 am to 2pm) and peak hour for out-patients are in general same for the centres.
- no definite time table is maintained for health education class and field visits by MA and FWV.

GUIDELINES: Scale

Workload: Average attendance around 30 per day excluding escorts.

Staff: Based on the existing staffing pattern and strategy for man power by the year 2000, the following staffing pattern is proposed:

<u>Category of staff</u>	<u>Number</u>
--------------------------	---------------

Full time:

Medical Assistant	1
Family Welfare Visitor	1
Pharmacist/ Laboratory Assistant	1
Ancillary staff (aya, peon /guard)	2

Part time:

Traditional Birth Attendant	1-2
Family Welfare Worker (as a base for field work)	3-4

Visiting staff:

Medical Officer (once per week) 1
Visiting team for F.P. sterilization
Teaching staff and supervisors

Working Hours:

The centre will operate Saturday to Thursday as follows:

9 am to 2 pm, 6 hours a day.

Domiciliary visits will be conducted in the second half of the day, according to schedule and demand. A time table will be maintained to show clinic types and hours by full time and visiting staff.

Note/ Comments/ Changes from proposed guidelines:

UNION HEALTH AND FAMILY WELFARE CENTRES AND HEALTH POST:

6.4.2.3 Organisation

Discuss. Sh.No.UHFWC/1.1 6.4.2.3 A. Discussion on Operational Policies DATE

1.1 Delegation of responsibility and authority:

A clear definition of activities/ tasks and delegation of responsibilities are essential to achieve working efficiency and reduce the possibility of duplication of services. Strong link and co-ordination between field level workers, Health Post, UHFWC and UHC will be maintained to enhance the quality of services, training of staff and supervision.

1.2 Efficient use of staff:

The aim is to distribute tasks so as to use available staff most efficiently and keep more skilled staff to deal with more specialised cases. For example, if all patients are screened by MA for general treatment of minor ailments, those beyond his capacity can be seen by a doctor. It will enable him to give proper time to a patient for consultation and examination. It will also reduce waiting time for patients who will be examined by the doctor.

1.3 Easy flow of patients, staff and goods:

Clear circulation route is necessary to enhance easy flow of patients, staff and goods without much conflict among them. Similar activities will be grouped together to reduce such conflicts.

1.4 Standardisation:

Same as UHCs, standardisation of procedures, spaces and equipment will be followed. Registration and record system is also recommended to use a standard method.

1.5 Sex segregation and privacy (visual and aural):

Socio-cultural practices in Bangladesh, specially in rural areas, demand privacy for female patients. Privacy of different levels need to be provided in different activity areas e.g.

Waiting: waiting areas for male and female patients should not be shared. As majority of muslim female patients observe "parda" and also mothers may need to feed their children, they require separate female waiting area or one central waiting area with screening.

Examination and Treatment: patients need privacy during physical examination and treatment, specially needed for A.N., P.N. and F.P. patients.

Consultation: patients do not want to express their illness in front of other patients. During consultation they need audio- visual privacy.

1.6 Security:

It is important to consider security of the health centre and staff e.g. providing boundary wall, security guard, proper building location and space organisation.

1.7 Integration of under five, ante natal, post natal and family planning cases:

It is convenient for mothers with children to get required services at every visit. If curative services and family planning services are provided through two different units(e.g. RD and UHFWC), for socio-cultural and religious reasons women in the community will try to avoid visiting the centres. Until the preventive and promotive services are combined with curative care it will be difficult to avoid under utilisation of the facilities.

For Health Post only the scope of services are outlined. The basic services of under five, pre natal, post natal and family planning clinics will be same at each level of PHC facilities.

Note/ Comments/ Changes from proposed guidelines:

6.4.2.3 B. Individual Sheets on Organisation of Functions

Sheet No.UHFWC/3 A.1 RECEPTION, WAITING AND PATIENT CALL DATE

AIMS AND OBJECTIVES:

As a first point of contact to provide obvious and welcoming reception, user responsive waiting and call system to avoid disorder and overcrowding and to minimise waiting time.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- no such reception point and delegation of work for reception and patient call.
- lack of staff.
- a central waiting space is used by both male and female patients with inadequate or complete lack of sitting arrangements.
- the location of tube-well and sanitary facilities is not visible from entry and waiting in a majority of the centres and needs sign posting/ directional signs.
- female and child patients are more numerous than male patients.

GUIDELINES:

Operational Policies:(Organisation)

1. Reception: The activities in reception are associated with the personal contact between male (peon)/ female (aya) assistant and patient/ patient's escort after arrival of patient.

- patients may arrive on foot, private (rickshaw, boat) or public transport.

- direct access without prior appointment to the health centre will be for first visit and return visits will be decided by clinicians.

- patients may be received individually or in a group (e.g. mother with children and patients with relatives).

- patients will be received by peon/aya and directed to respective clinic according to sequence of arrival.

- guidance to waiting, toilet, source of drinking water and any query will be given.

- during rainy season they may need to wash their feet before entering the clinic.

- priority will be given to emergency cases.

- patients will be called from waiting areas to consultation, examination and treatment room or class room.

- supervision of main entrance and waiting area.

2. Waiting and patient call:

- centralised waiting with screened male-female separation.

- attempts should be made to reduce waiting time. The waiting time can be utilised in learning from display or health education.

- patient call system should be based on first come first served basis. Use of number cards or number on prescription will help to regulate patient call. But in that case patients level of literacy has to be taken into account.

- clinicians may call personally or use bell system.

- patients and escorts should be under constant supervision of receiving staff while waiting.

- need easy access to clean drinking water and toilet facilities.

- displays in locally digestible manner for teaching patients.

- patients waiting should not be a source of distraction for clinicians and also should not hamper privacy of attending patient undergoing C/E or treatment.

AIMS AND OBJECTIVES:

To keep patients records, essential for future reference and treatment planning, within the time and capacity of the existing available staff and space.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED

- records of respective patients are maintained individually by the MA, FWV and Pharmacist in their clinic.
 - mostly use supplied registration books with standardised format.
 - lack of knowledge among the staff regarding the use of data collected.
 - often filled-in regardless of actual number to maintain records
 - no separate storage space for records.
-

GUIDELINES:**Operational policies: (Organisation)**

Record handling system should be easy to maintain, requiring minimum staff time and contain only effective and essential information. Also recorded data should be summarised regularly so as not to become too bulky.

- central record storage staffed by clerk/ receptionist.

- records will be prepared at individual clinic, collected by the peon/aya.

- data collected in the clinic will be sent to district level for production of composite statistics and monitoring.

- all patients will be provided with a personal record card (major and minor illnesses, treatment given and other records, growth chart for children) and the clinic will maintain the records essential for surveillance and monitoring of data (e.g. number of new and return patients by age, sex, illness and so on known as the diagnostic index.)

- use of standard format to reduce data collection time and help during compilation and easy retrieval of information and also to reduce unnecessary record storage space.

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

The objective is to provide comprehensive preventive, promotive and curative services to all children under five together with ante natal, post natal and family planning services as efficiently as possible keeping in view reduced waiting time, patients privacy and quality of care.

Integration of under five's, ante natal and family planning is recommended. The services will be provided by FWV and the assistant (e.g. TBA) and the referral cases within the centre will be seen by MA and visiting doctors.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- at present A.N., P.N., Under five and Family Planning services are provided in UHFWCs by FWV while RDs are only for curative care.
 - lack of privacy for patients to express their problems.
 - lack of privacy during examination.
 - inadequate equipment and furniture to carry out activities.
 - lack of storage facilities for patients records.
 - under-utilised services.
-

GUIDELINES:

Operational Policies: (Organisation)

A. Ante natal and Postnatal:

The consultation and especially examination of patients to be carried out maintaining high degree of privacy.

Activities associated with ante natal and postnatal services would be carried out mainly by FWV.

- history taking,
- physical examination,
- weighing,
- simple pathological investigation (e.g. Hb, urine),
- prescription of vitamin, iron pills, anti malarial drugs,
- immunisation,
- screening,

- for complicated cases special arrangement would be made with the visiting doctor or frequent visit would be recommended or referred to nearby UHC/ MCH centre.

- mothers to be encouraged for post-natal visit if any complication arises after delivery and gradually shifted to under five and family planning clinics.

Other associated activities:

- storage of medicine, vaccine and some instruments and equipment relevant to service needs,
 - data collection as required,
 - compilation of statistical data in liaison with record section,
-

- referral to base hospital or admission to hospital; arrangement for home delivery by village midwife; transport arrangement for complicated delivery cases (if possible) will be provided.

B. Under five clinic:

Services will be provided for children, age from birth to five, accompanied by their mothers.

Group treatment of mother and child is preferred as mother can learn from other's problem and due to repetition, the advice would be more effective and also to raise a sense of comparison.

The following activities/ services are identified:

- weighing of children, growth monitoring,
- recognition of childhood diseases
- advice on nutrition and hygiene
- dispensing
- injection, immunisation
- treatment
- advice to mother, health education

- supervision of the health of all children under five, those visit the clinic.

C. Family Planning:

Here also high degree of privacy and confidentiality to be maintained during individual consultation and examination. Group activity can be carried out for F.P. advice and health education services.

The service should encourage:

Optimum birth interval, Target number of children, Health of mother and child, Attendance of both parents. Patients attending under five, A.N., P.N. will be encouraged to attend F.P. clinics.

Organisation of activities:

- issue of contraceptive preparation and devices
- storage of medicines, vaccine, instruments, equipment and Government provided incentives (i.e. clothes etc.)
- data collection and compilation with record section. (An integrated and organised information system is essential for planning and management of Family Planning Programme.)

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

Consultation, examination and treatment of common ailments to be carried out as effectively and efficiently as possible keeping in view reduced waiting time, patient's privacy and quality of care.

The purpose is to provide general out-patient consultation and examination services to adult males, females, children above 5 and referral patients from MCH and under 5 clinics from the same health centre.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- lack of privacy for patients to express their problems, as the room is directly visible from waiting area and patients can enter directly and wait inside the room.
 - due to the lack of a pharmacist, the MA had to distribute drugs and medicines
 - no such referral system appear to operate
 - no visiting doctors came to see patients.
-

GUIDELINES:

Operational Policies: (Organisation)

- consultation and examination of general out-patients by MA in order of arrival and referred cases from FWV.

- referral of patients to MO within the same unit or UHC. Special cases will be seen by visiting doctor.

- decision for treatment and medication.

- all patients should be seen. The patient mix may include accident, communicable disease cases.

- emergency and serious cases will be given priority.

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

To provide simple pathology tests for patients especially for expectant mothers and for F.P. to avoid unnecessary travel to UHC and using the skill of available staff.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- simple laboratory tests (e.g. urine) for female patients are done by FWV in her clinic.
 - no specific arrangement for laboratory tests
-

GUIDELINES:**Operational Policies: (Organisation)**

- simple test (i.e. Hb, urine) will be carried out by FWV/ pharmacist.
 - complicated laboratory tests will be referred to UHCs.
 - sample will be delivered by patient to FWV/ pharmacist at their room.
-

Note/ Comments/ Changes from proposed guidelines:

To provide centralised treatment facilities used for minor surgical procedures, dressings, immunisation and family planning sterilisation considering absolute privacy of patients from outsiders, control of infection and working efficiency.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED

- treatment of patient done by MA, FWV and occasionally (e.g. once per month) by a team from UHC consisting of MO(MCH) and supporting staff.
 - immunisation and injections are given by FWV in her room, once in a week for females and children in her room. (cold box delivery from UHC)
 - treatment and recovery grouped on one side, indirect from patient waiting area.
 - mostly under used.
 - lack of equipment and furniture.
 - unclean and not maintained properly.
-

GUIDELINES:

Operational Policies: (Organisation)

- dressing, injection and minor surgical intervention will be carried out by clinicians (i.e. MA, FWV).

- sterilisation for F.P. procedure will be carried out by visiting medical team, once a month, assisted by MA and FWV.

- immunisation of children and expectant mothers will be carried out by FWV once in a week.

- recovery/ observation for F.P. patients.

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

The objective of the pharmacy is to get the right drug to the right patient conveniently and efficiently and to make sure that the patient knows how to use it. (22)

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- Lack of pharmacist often compels MA or FWV to distribute medicine to patients.
 - one dispensing point for both male and female patients and patients queue within the waiting area.
 - inadequate storage system.
 - medicines are received in the form of kits (DDS, MCH).
 - inadequate supply of drugs and medicine causes dissatisfaction among patients and staff and often leads the patients to by-pass the facility and be-little the working efficiency of staff and faith of the community in them.
-

GUIDELINES:**Operational Policies: (Organisation)**

The pharmacist will dispense prescribed drugs during clinic hours.

Other than distribution, the rest of the work can be done before or after clinic times.

Storage and distribution of all items will be centralised for efficient use of staff time and better control and record keeping.

Requirements have to be predicted, drugs ordered and stored, checked and bulk packaging broken down for use, the prescribed doses issued in a suitable manner for the patient to hold and use them, and stocks replenished.(22)

Records of items received, used and ordered should be maintained for proper management. Some items will be pre-packed and some may need preparation.

The pharmacy should be ventilated and kept as cool as possible, as humidity and temperature may ruin drugs in store. For vaccines there is a need for refrigeration. A cold box can be used due to lack of electricity supply.

Security and supervision of stored medicines, drugs and other supplies to prevent pilferage and use of new stock before the old.

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

The aim of health education is to alter behaviour where it causes disease.(60) The objective is to provide health education to patients, visitors and staff, both outside and inside the centre, to promote healthy living, use available services and prevent diseases.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED

- poor utilisation
 - very irregular
 - mostly given by FWV during consultation with mothers regarding nutrition, child care and so on
 - occasionally a group of waiting patients, especially females, are given lectures on health matters in the waiting area.
-

GUIDELINES:**Operational Policies: (Organisations)**

Health education on the need for knowledge on hygiene, nutrition, environmental sanitation, maternal and child health care and family planning should be given priority. It needs understanding of folk tradition and taboos.

- will be provided along with preventive and curative services

- health education may be given during individual consultation in different clinic or in a group (mother and children of several families) within clinic hour.

- health education in the form of discussions, talks, demonstration and display in the waiting and clinic spaces.

- provided by centre staff and visiting staff, both within the centre and outside in the community.

- will be part of training process for health centre staff and outreach service providers (FWW, HW).

- health education curriculum and devices (e.g. posters, books) will be supplied centrally. Local adjustments will need understanding of beliefs and practices of people.

- providing some practical demonstration within the premise will be encouraged (e.g. well maintained latrine, gardening, protected water supplies).

Note/ Comments/ Changes from proposed guidelines:

Sh.No.UHFWC/11 A.9 AS A BASE FOR OUTREACH/DOMICILIARY SERVICES:

a. School Health b. Health Education c. communicable
disease control and environmental sanitation

DATE

AIMS AND OBJECTIVES:

To provide outreach /domiciliary services through health centre and field level staff to bring health care close to where people live and work.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- outreach services are provided by field level workers (e.g. FWA, FWW) who use the centre as their base for official work, monthly meeting and data compilation.
 - the health centre staff irregularly attend field visit.
 - RDs provide no such services.
 - the field staff work independently without the concern of health centre staff.
 - lack of co-ordination among different field workers (health and F.P. side)
-

GUIDELINES:**Operational Policies: (Organisation)**

Management and accountability arrangements of outreach/ domiciliary services should be clear to avoid duplication of tasks and to gain users faith in them.

a. School Health:

- health supervision
- screening
- mass immunisation
- health education on cleanliness, sanitation, nutrition
- diagnosis and treatment of minor ailments
- referral of cases to UHFWC or UHC

The services will be provided by health centre staff in the local schools. Participation of school teachers, specially on health education will be encouraged.

b. Health Education:

-health education to be provided during household visit to individual family/ group of families, within the centre for people from the community and in the health post/ satellite clinics by field staff and centre staff.

-improved sanitation activities, promotion of healthy life practices and use of available services will be advised through demonstration and discussion.

c. Communicable disease control and environmental sanitation:

- promotional activities concerning clean water supply, proper drainage, garbage and soil disposal, food handling and so on to prevent outbreak and spread of seasonal/ communicable diseases with the active participation and co-operation of the community.

- patients suffered from communicable diseases to be followed up.

Note/ Comments/ Changes from proposed guidelines:

Sh. No. UHFWC/12 B. SUBSIDIARY FUNCTIONS: 1. TEACHING AND TRAINING

AIMS AND OBJECTIVES:

To provide teaching and training services to health centre staff, field level staff and people from the community (e.g. school teachers, local practitioners) in order to improve their skill and knowledge.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- irregular and unorganised teaching and training facilities for centre staff and field level workers.
 - MA/FWVs complained about lack of in-service training and re-fresher courses.
 - classes are held once per month/ a course of two months long for traditional birth attendants organised by FWV in the centre and irregular lectures in the UHCs for MA and FWVs.
 - classes often held in the central waiting area which has got a blackboard as a teaching aid. Other teaching aids (e.g. display boards, posters, books, manuals) are kept in the FWVs room.
-

GUIDELINES: (Organisation)

"All medical workers have an educational role which is closely linked to and enhances their therapeutic one. a. Skilled staff members have a duty to teach the less skilled ones. b. All medical staff have a teaching vocation in the community they serve." (60)

- staff from upper level (e.g. MO, MO-MCH, UHFPO, FPO, HI, SI) should visit lower level to teach health centre and field staff on a regular basis.

- in-service training and re-fresher courses to be organised for centre staff in UHFWC and UHCs depending on the availability of staff.

- teaching on environmental sanitation, public health measures and other PHC related subjects will be provided along with clinical subjects not only for centre and field staff but also for the people from the community (e.g. teachers, religious and other community leaders).

Note/ Comments/ Changes from proposed guidelines:

Sh.No. UHFWC/13 C.1 SUPPORT FUNCTIONS:1.EQUIPMENT STERILISATION

AIMS AND OBJECTIVES:

The aim of sterilisation is to kill organisms and so reduce infection risks as much as possible. The sterilisation procedure should be simple, effective and reliable.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- done by FWV in her room using cooker on kerosene stove.
 - water needed for sterilisation is used from outside tube well.
 - items for sterilisation are dressings and gloves, medical instruments, mother and child health care kits, family planning kits.
-

GUIDELINES:

Operational Policies: (Organisation)

"Clean buildings, minimum dust, nothing to attract insects, protection against animals, clean water, good cross ventilation with sun washed air, well spaced building, clean staff and patients, well maintained latrines, well washed and sun dried linen and uniforms are all first line defence against infection and must be seen to all the time"(22)

Organisation of activities:

- the FWV will be responsible for sterilising equipment.

- sterilisation in a UNICEF pressure cooker.

- washing is necessary before sterilisation. - returned and used goods should be washed and sterilised by best available method.

- washing area should be away from sterilising area

- sterilisation should be done just before use

- washing should be done just after use.

- proper storage of washed items.

Note/ Comments/ Changes from proposed guidelines:

Sh. No.UHFWC/13 C.2 SUPPLY, STORAGE, DISTRIBUTION	AND DATE
DISPOSAL	

AIMS AND OBJECTIVES:

The aim is to provide adequate supply, secure storage and distribution of essential items and their efficient management ensuring right supply at right point in right condition.

The objective is to enhance a healthy environment and reduce the risk of infection and health hazards through proper disposal of waste.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED

- irregular supply of items
 - disposed outside in the surrounding empty land
 - majority lack proper storage space
 - lack of security arrangement
 - storage combined with dispensing
-

GUIDELINES: Operational Policies: (Organisation)Supply, storage and distribution:

- mainly supply of drugs, medicines, food supplements, family planning items and incentives (clothes, money), stationery, equipment will be received at certain intervals and on requisition based on the items of supply from UHC/ central store. Some items will be in the form of kits (pre-packed box) and others as a bulk or intermittent supply.

- central storage and distribution for all items

- the items will be checked, stored and distributed by the pharmacist under the guidance of a medical assistant

- records should be kept of each item ordered, supplied and distributed by

the pharmacist following a systematic method so that in his absence other staff (MA/ FWV) can perform his duty or check on a regular basis.

Disposal of used items:

The following functions need to be considered:

- collection and temporary storage of waste at point of use

- disposal of waste. Dangerous items (e.g. broken syringes, needles) to be disposed with care, preferably buried.

- bins with infected disposal should have lid to reduce the risk of cross infection.

- burning of waste (e.g. infected items which can not be reused) under supervision, away from clinic area.

Note/ Comments/ Changes from proposed guidelines:

AIMS AND OBJECTIVES:

As an educator of health care in the community and for efficient functioning, the aim is to keep the centre clean and well maintained both inside and outside.

Easy flow of supplies, records and disposal from outside to the centre and within the centre without hampering clinic activities.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

- around 3/4 of the centres were found to be unclean.
 - no regular system or responsibility for maintenance, only done on ad-hoc basis if and when funds are available.
 - no initiative from health centre staff or from the community to keep the centre clean and maintained with or gardens tidy are observed.
 - under utilisation of facilities, absence of staff, inadequate supervision from upper level and poor administration were found to be the underlying reason.
 - used linen is either sent to near-by laundry or washed by aya within the premise.
- Lack of proper washing space often led them to use verandah/ corridor.
-

GUIDELINES:

Operational Policies: (Organisation)

Cleaning and maintenance, gardening and portering:

- domestic staff will be responsible for cleaning, gardening and portering after clinic hours.

- regular maintenance of buildings and equipment need to be organised centrally for the district.

- a time table or programme for maintenance or use of buildings and facilities should be constructed.

Laundry:

- collection of dirty linen

- temporary storage

- wash and dry

- storage and distribution

washing of linen will be done under the supervision of centre staff.

Note/ Comments/ Changes from proposed guidelines:

6.4.2.4 Management

Sh. No.UHFWC/16 MANAGEMENT

DATE

AIMS AND OBJECTIVES:

The aim of management will be the best use of available staff and facilities to the benefit of patients and users. The purpose is to provide proper management and administrative structure so that there will be clear delegation of authority and responsibilities and to avoid duplication of work, chaos, confusion and distrust among staff members.

PRESENT APPROACHES AND PROBLEM AREAS IDENTIFIED:

-the existing UHFWCs are under the family planning section and RD's are under health section of UHC and working as independent units with separate health centre and field level staff.

-it is envisaged in the Government health plans and policies to integrate these two sections.

-supervision from upper level is not regular

GUIDELINES:

All the members of health centre staff will work as a team. the overall administration and supervision of the clinic will be the responsibility of MA, supervised by Medical Officer of Upazilla Health Complex. For clinical purpose, the health team will be supervised by doctors/ MO from upper level. Each paramedical staff will be responsible for their own clinic. The Medical Officer and the MA will need to have basic management training.

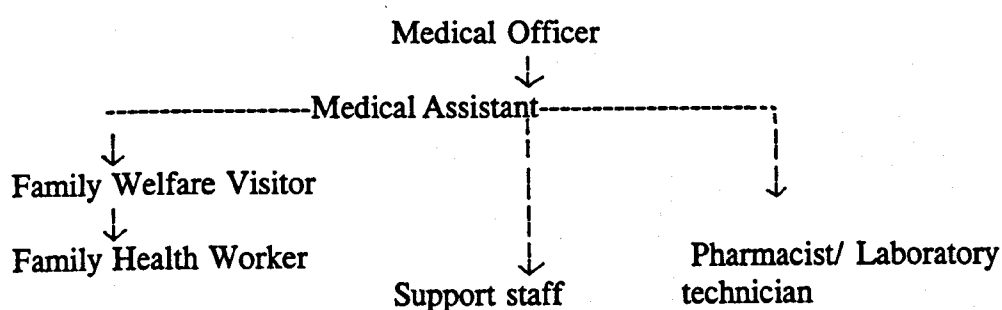


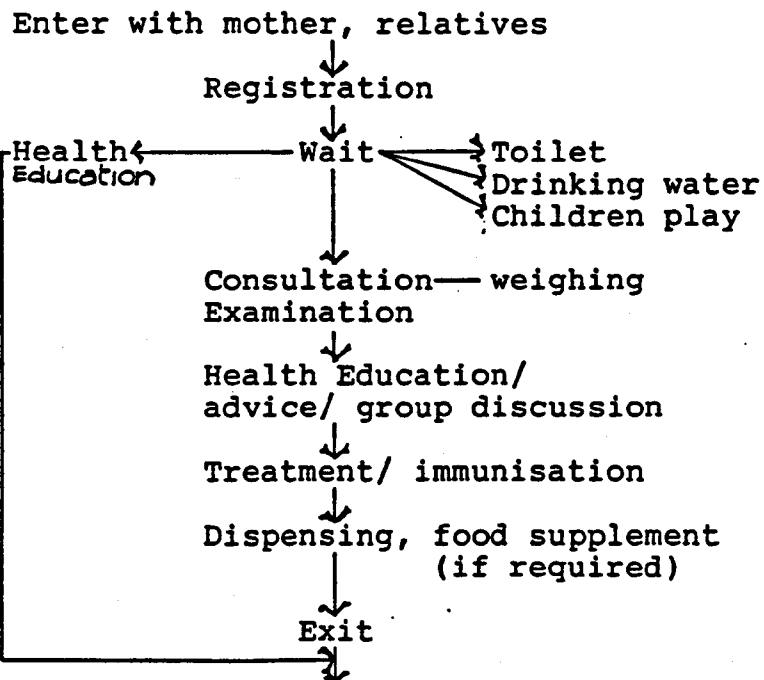
Fig. Management Structure

Note/ Comments/ Changes from proposed guidelines:

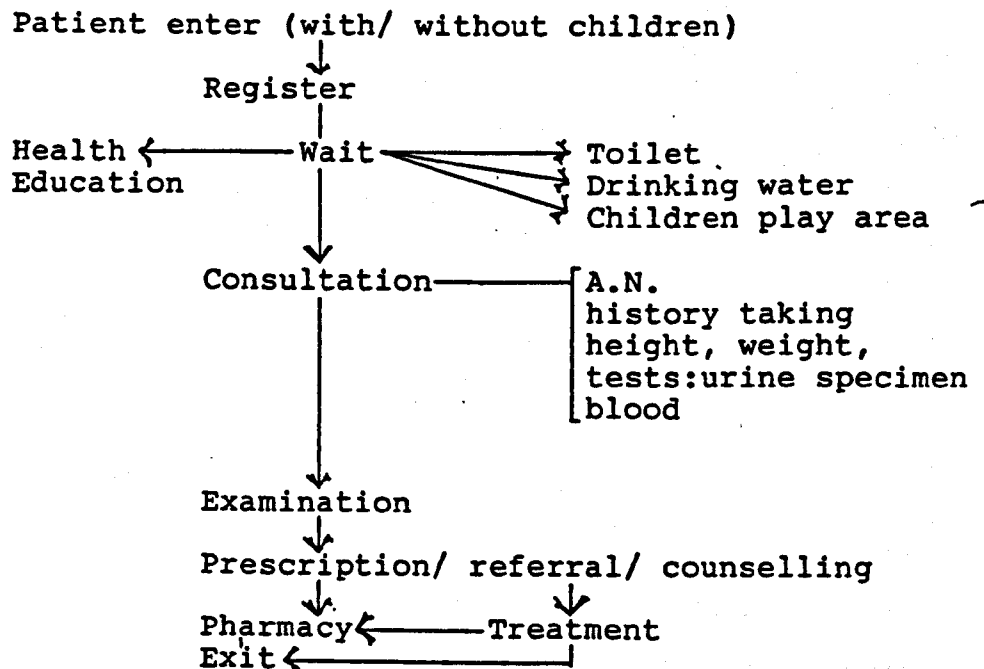
6.5 Activity Analysis

ACTIVITY ANALYSES

UNDER FIVE:



ANTE NATAL:



ACTIVITY ANALYSES

OUT-PATIENT:

Patient arrives on foot/ private/
public transport-self or accompanied
by children/ relatives/ escort
(direct /referred)

↓
Patient received by clerk/ receptionist.
Register (serial no., name, sex)
according to category of visit (direct/
referred) and direct patient to respective
waiting area.

↓
Patient waits till called by MA/
FWV/ Doctors or their assistant
(depending on availability) according
to sequence of arrival.

Drinking
water
Sanitary
Facilities

↓
Patient enters clinicians room (filter
/general out-patient clinics) - self/
along with escort

↓
Patient goes through following procedures
(any/ all/any combination, in any order):
history taking, problem statement, weight
and height measure, blood pressure check,
examination-seated, standing or lying on
examination couch (dressed/undressed),
patient's record on standard format,
prescribing on standard form, request form for
Laboratory test, X-ray, Admission, instruction
as appropriate for medication, tests required,
preventive/ promotive measures/ health education,
referral from filter clinics to MO within the
complex or upper level (e.g. District Hospital)
Patient leaves room

↓
Patient goes to Laboratory
to give sample (blood, urine)
↓
Patient goes to X-ray unit
↓
Patient goes to emergency
for treatment/ admission.
↓
Patient goes to EPI clinic
for injection/ immunisation

↓
Patient goes to Dispensary

↓
Patient goes home ←

6.6 Schedule of Accommodation

SCHEDULE OF ACCOMMODATION	
Functional Areas	Number
HP	
Main entrance	1
Reception, registration	1
Main waiting combined with health education	1
Toilet (Male and Female)	2
C/E of general out-patient, MCH, F.P., Under-five (Auxiliary health worker), Store	1
	1
UHFWC	
Main entrance	1
Reception, registration	1
Main waiting combined with health education teaching and training	1
Children play (outside)	
Toilet (Male and Female)	2
Drinking water (outside)	
Consultation and examination	2
a. General out-patient	1
b. MCH, F.P., Under 5	1
Treatment, Immunisation and Sterilization (including equipment sterilisation)	1
Recovery (2-bed)	1
Field workers office/visiting doctors clinic (shared as MO's clinic is needed once in a week)	1
Dispensary and Laboratory test	1
Store	1
Kitchenette	1
Circulation	

SCHEDULE OF ACCOMMODATION

UHC

A. OUT-PATIENT AREA:

- | | | |
|----|--|--------|
| 1. | Main out-patient entrance | 1 |
| 2. | Reception, registration | 1 |
| 3. | Main waiting (screened male-female separation)
combined with health education, class
Sub-waiting (near individual clinics) | 1 |
| 4. | Consultation and Examination
Filter clinics: | |
| | a. MA | 1 |
| | b. FWV | 1 |
| | General Out-patient (medicine, surgery, gynae.) | 3 |
| | MCH including under 5 and Family Planning | 2 |
| | Dental | 1 |
| 5. | Dispensary | 1 |
| 6. | Sanitary facilities (male, female) | |
| B. | DIAGNOSTIC AND TREATMENT AREAS: | |
| 1. | Injection and Immunisation (with cold storage) | 1 unit |
| 2. | Laboratory (including clinnet) | 1 " |
| 3. | X-Ray (X-ray-1, dark room-1, dress-change-2,
store-1, office-1) | 1 " |
| 4. | Emergency (reception and admission-1, treatment
and recovery area-1, store-1, office-1) | 1 " |
| 5. | Operating (O.T.-1, Scrub-up-1, dress-change-2,
Dirty utility-1, clean-utility-1, recovery bed-2,
staff toilet) | 1 " |
| 6. | Delivery (Delivery room-1, scrub-up/toilet,
dirty utility-1, clean utility/ store-1) | 1 |

6. IN-PATIENT :

Bed areas-male, female, children, isolation/
communicable disease, maternity and F.P.
patients- 31 bed (general-25, maternity-6)
Sanitary facilities (male, female)
Nurse's station, doctors room, treatment, dirty and
clean utility, store (linen, medicine, equipment...)
Pantry (shared), visitors waiting, relatives/
patient's sanitary facility

7. SUPPORT AREAS:

Stores	
Kitchen	
Equipment sterilisation (central unit)	1 unit
	1

8. ADMINISTRATIVE AREAS:

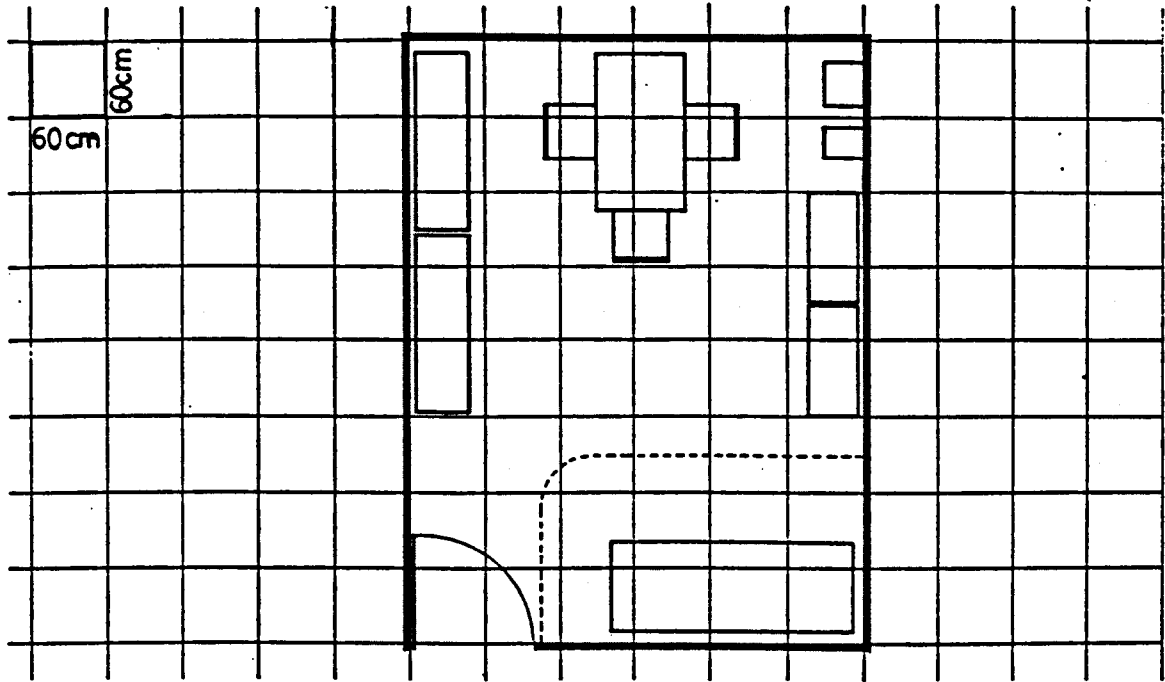
Office areas for health and family planning staff
and field supervisors
Teaching and training facilities

CIRCULATION

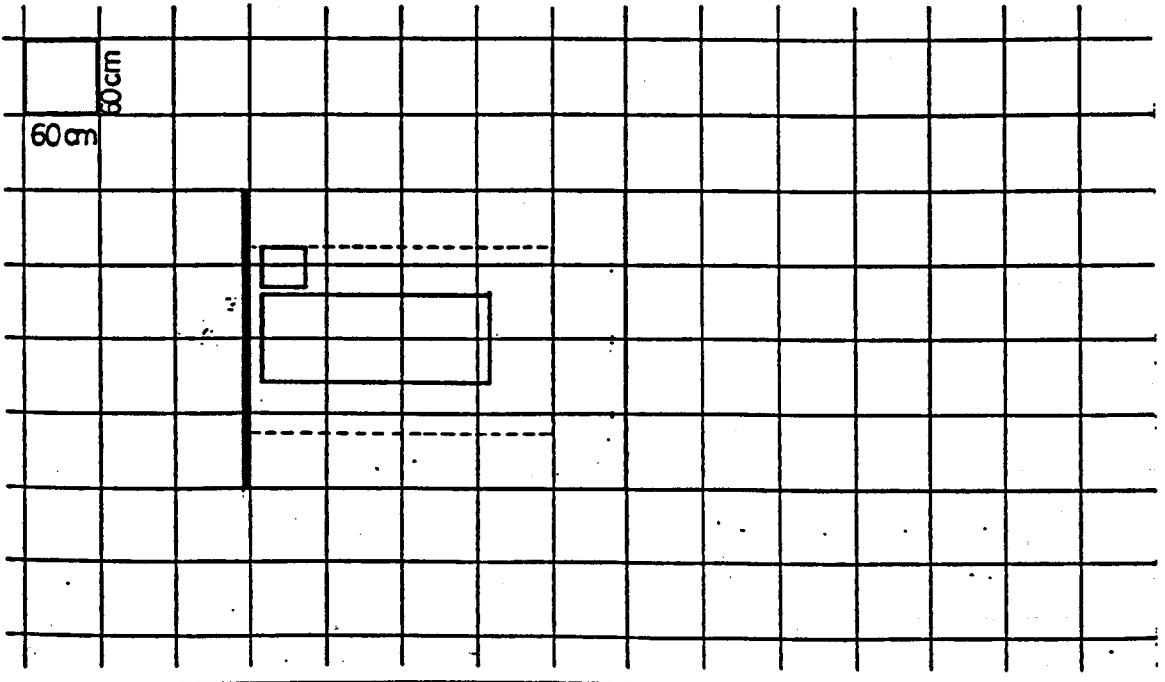
6.7 Room Data

	ROOM DATA	
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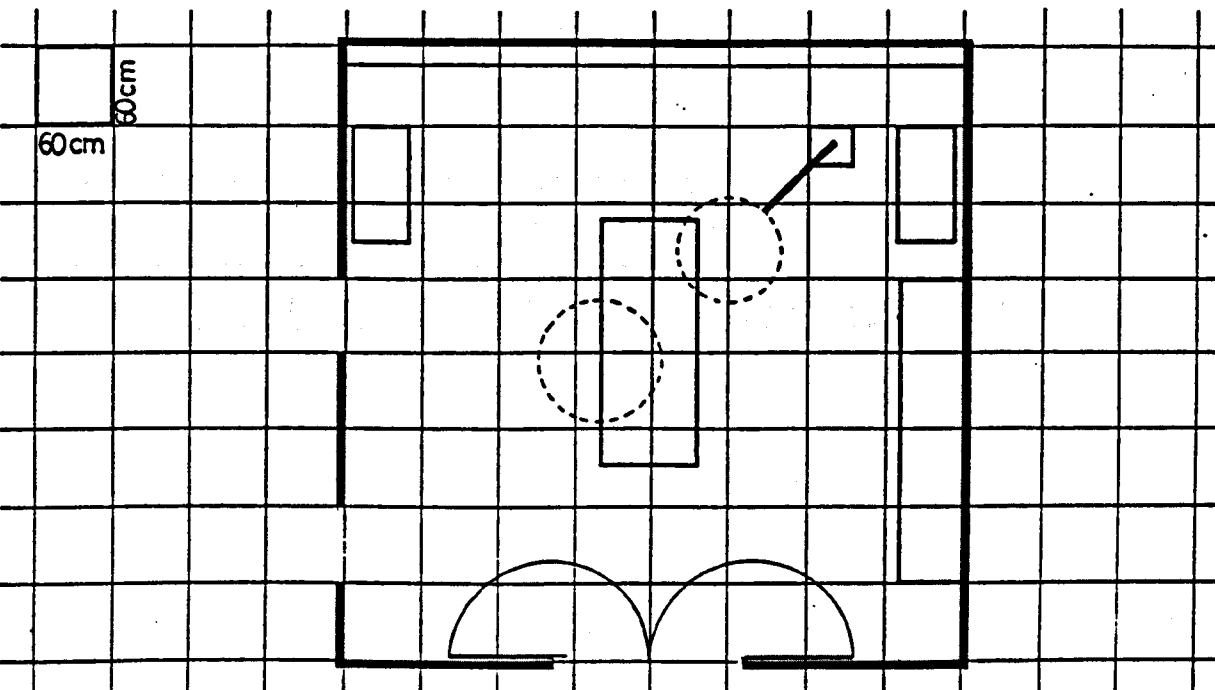
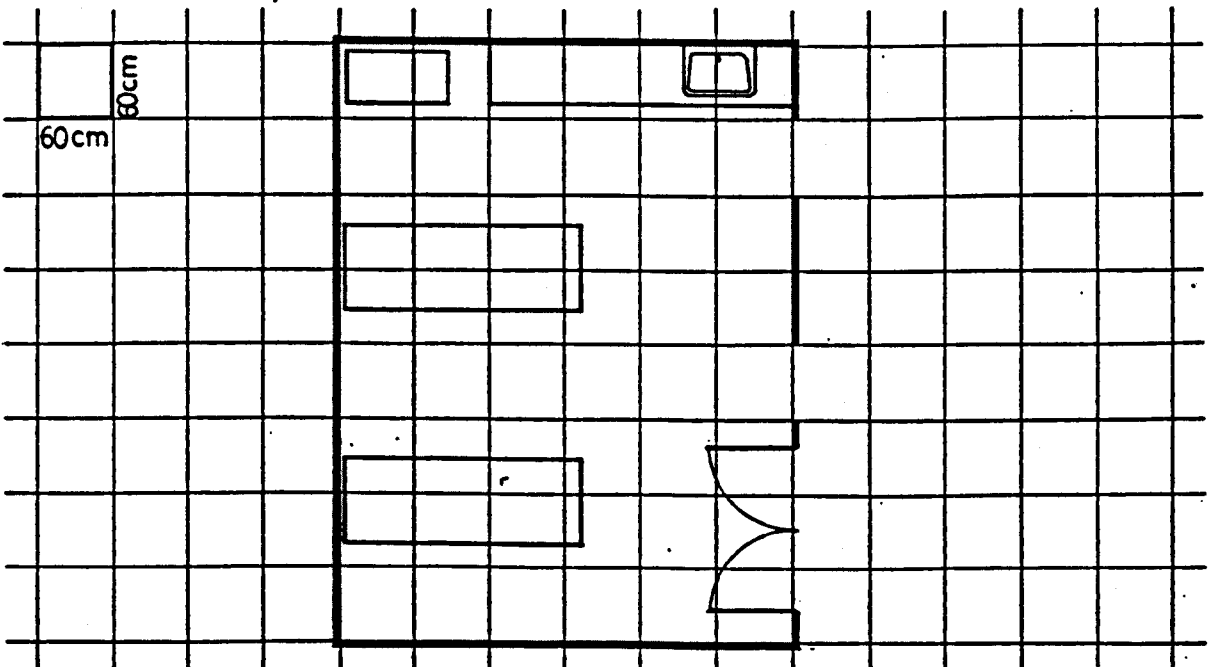
	CONSULTATION AND EXAMINATION	
--	-------------------------------------	--



	BED BAYS	
--	-----------------	--



	ROOM DATA	
--	------------------	--

	OPERATION THEATRE (O.T.)	
		
	DELIVERY ROOM	
		

CHAPTER SEVEN

A METHOD OF DESIGNING PHC FACILITIES

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A METHOD OF DESIGNING PHC FACILITIES

7.0 Introduction:

Based on the planning guidance set in Chapter Six, the aim is to develop design guidance for PHC facilities following a systematic approach. This is intended for the use of design teams working from different organisations and to develop a common understanding. Although it remains the fact that the ultimate choice of layout and architectural quality of spaces will depend on personal judgement of the design team, the guidance will help them to get essential information required for design and be a reminder of the important design strategies and principles to consider and how common mistakes learned from past experiences can be avoided.

Design principles and building strategies for growth, change, phasing, flexibility, building size and shape, environmental considerations, use of local materials and technology and so on are found important. These are set before developing a concept and design development.

It is hoped that this design guidance in combination with planning guidance will constitute a comprehensive tool for the use of health facility planners, designers and users.

7.1 Design Principles / Building Strategies

7.1.1 Planning and Design Strategy for Growth, Change, Phasing and Flexibility:

The past development trend of dispensaries, health centres and health complexes, particularly the older ones, shows that each unit has grown and changed over the years resulting in unplanned growth patterns, inappropriate functional relationships and rapid obsolescence. The pattern of growth and change in the existing buildings was mostly unpredictable at the design stage and provision was not made for such changes and expansions. A large number of Rural Dispensaries as well as a number of old District Hospitals are now planned to be replaced by new facilities. This is mainly because the existing buildings could not cope with the changes and demand for added facilities and also due to their lack of growth potential. Wherever additions and changes have been made to these existing buildings they have caused in-efficient functional relationships and service provision. On the other hand new construction involves a large amount

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of capital investment when demand on other areas such as support services, supplies, equipment and manpower remain unfulfilled.

Against such a background it is essential to design a unit which can grow and change over time and also to determine a pattern of growth for each unit. While developing a planning and design strategy for growth and change it is felt important to define them, identify their causes, factors, classification and also their application in design development. The purpose is to derive the essential determinants of growth and change to apply the strategy in the design process. An attempt must be made to accommodate the unpredictable otherwise there is chaos.

Definition:

The terms 'growth and change' are often used together. For the purpose of this study the following definition given by J.I. Kim is found to be appropriate.

"The term change includes the meaning of the term growth, since growth can be regarded as one specific type of change. Virtually growth means a change in a size to a greater size, which can be seen as a change in size.

Growth: Change in a size to a greater size

Change: Change in function, use and organisation" (60, p.11)

Causes and Factors of growth and change:

Health care buildings are complex institutions which because of their capital cost have a long life expectancy. They may never be finished buildings and are likely to change with the change in need and demand, changes in medical practice, technical improvements and financial opportunities.

The need for change in the system of health care provision is generated both from within and outside the system.

- from outside by changing environmental conditions; by changing life style; by population changes in location, age-structure and socio-economic status; by changing patterns of illness and so on.
- from within by the varying availability of finance, resources, and manpower; by improvements in medical knowledge and technology; by changes in the requirements of medical care produced by programmes of preventive measures and by changing concepts

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of the role of health care.(121)

Growth occurs as a result of varying factors e.g. increased workload, new techniques, prestige, dissatisfaction with existing provision and so on. Among the external and internal limiting factors of growth, the followings can be identified:(23)

External:

1. dimensional limit set by size and shape of the site.
2. economic limit with the available fund.
3. political and legislative limit enforced by plot ratio, zoning requirements and daylight factors.

Internal:

1. social limit for type of organisation.
2. structural limit
3. services like heat, light and air.

Classification:

Cowan (23) has classified building growth as follows:

1. Growth by larger functional units: e.g. a ward arranged around a particular staff structure can only be added as a complete functional unit.
2. Growth by small additions to floor space: e.g. occurs due to local need for additional space related to an individual task.
3. Growth by larger structural units: a building with large scale structural elements need repetition for new addition, e.g. a bay in a factory.
4. Growth by using space more intensively: this is the phase through which all the previous types pass before additional space is provided where functional content and activities are increased over time.

Growth can be planned with the objective of phasing the whole process of development.

Phasing:

Due to resource limitation it is not always possible to build a health building to its final size. When resources are available existing buildings are either expanded or upgraded along with new constructions. So a health building should incorporate such growth possibilities from inception. They should also be able to be built in stages under a phased development

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programme. According to R. Hossain (51) the following points need to be considered:

Final Shape: although it is difficult to determine the final shape in a theoretical way, the limitations imposed by a site can be used to determine the final shape.

Initial Phase: This has to be determined by the immediate needs and how these can be met with the available resources.

Number of stages: should be predetermined, as far as possible. These can be adjusted with the available resources from time to time.

For staged development it is necessary to identify those parts of the building which are immovable for the life of the building known as 'hard/time independent' areas and those which can be altered with the changing need are known as 'soft/time dependent' areas. The theory is to place hard areas(e.g. operating theatre, radiology, delivery) beside soft areas(e.g. out-patient clinics, administration) so that in case of expansion hard areas can take place of the soft areas. It is difficult to shift the hard areas because of technical reasons such as engineering services, finishes and shifting heavy equipment.

Flexibility/ provision for future expansion and remodelling throughout the planning process:

"This highlights the need for a design which offers the possibility for change throughout the entire life of the project, and which incorporates scope for future extensions and adaptation to new roles even when the health care establishment is built and running." (95, p.98)

A high degree of flexibility is an essential prerequisite to meet the demand for change. According to Nilsson, two types of flexibility are identified,

"Whereas short-term flexibility is needed to meet internal organisational changes, long term flexibility is needed for change of a more permanent nature in departmental size and location." (95, p.99)

To adapt short and long term flexibility for changing functions can be achieved in two ways:

1. "adaptable building" which can adapt physically to different functions.
2. "universal building" where different functions can be accommodated without structural alterations. The more universally usable the floor space, the better chance there is of meeting new needs with the minimum of disturbance.

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He also suggested to overlap the briefing, design and construction stages to enhance flexibility throughout the entire planning process. It is necessary to consider flexibility in terms of space use and multi-use of spaces during the planning and briefing stage. Careful programming of space including time tabling and the need for future extension and growth also needs to be considered. In a developing country like Bangladesh, there is a need to establish health care facilities in the simplest, quickest and most economic manner with the provision for maximum flexibility throughout the entire planning process.

Examples from developing countries:

Two different approaches can be identified e.g. a. Definite growth plan and b. Type plan:

1. Whole health building type plan
2. Departmental type plan

The following examples, those chosen as case studies in chapter two, are illustrated with the growth and change possibilities.

1. Model Health Centre: (see fig.7.1)

a. standardised buildings

b. a small clinic can expand by stages into a health centre and subsequently to a district hospital

c. proposal is a specific layout

d. roof can be extended in one direction to give extra space

e. fairly precise relationship to allow growth and change

- | | |
|--------------------------|--------------------------------|
| 1 waiting | 14 dirty linen |
| 2 consulting | 15 laundry |
| 3 examination/ante-natal | 16 linen |
| 4 future extension | 17 sterilising |
| 5 weighing | 18 clean-up/disposal |
| 6 clean treatment | 19 staff latrines |
| 7 dirty treatment | 20 labour |
| 8 laboratory | 21 delivery |
| 9 dispensary | 22 children's and women's ward |
| 10 reception/information | 23 men's ward |
| 11 staff/conference | 24 male latrines |
| 12 store | 25 female and hostel latrines |
| 13 examination | 26 kitchens |
| | 27 in-patients' washing |

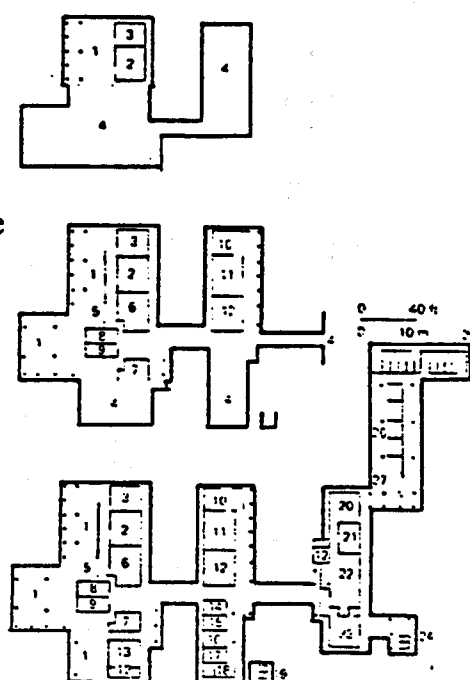


Figure 7.1: Model Health Centre, Source: (25)

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2. Sudan: (fig.7.2)

- design based on modular system (30 cm grid for PHCU and Dispensary)
- PHCU can grow to dispensary and RHC to rural hospital following incremental approach
- standard room height and width help incremental growth
- partition wall can offer flexibility for change
- fixed type of growth plan
- there are type plans for parts of facilities

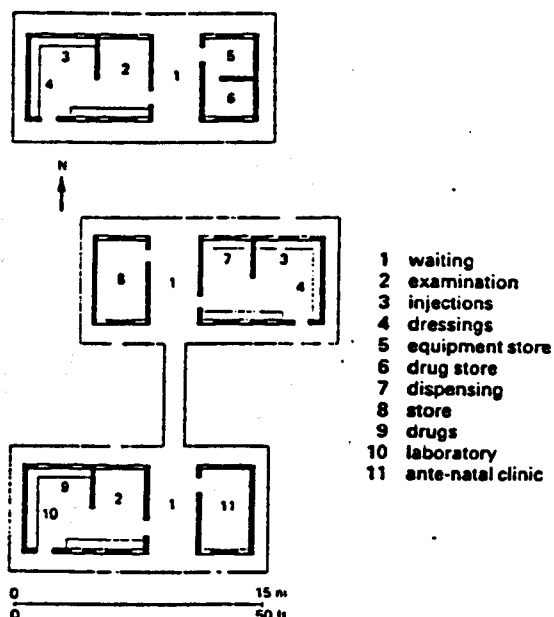


Figure 7.2: Sudan, Source: (25)

3. Columbia:(fig.7.3)

- flexible planning by phased construction
- development of health post to health centre and subsequently to small sized hospital
- horizontal expansion in both direction
- clear circulation route

- | | |
|-------------------------------|---------------------------------|
| 1 waiting and meeting room | 14 emergencies |
| 2 medicines | 15 obstetric beds |
| 3 injections and vaccinations | 16 adult beds |
| 4 consulting | 17 children's beds |
| 5 store | 18 kitchen |
| 6 toilet | 19 laundry |
| 7 sitting/dining room | 20 delivery |
| 8 bedroom | 21 labour |
| 9 kitchen and clothes yard | 22 doctors' changing and toilet |
| 10 dentistry | 23 clean utility/sterilisation |
| 11 information/records | 24 dirty utility |
| 12 health inspector | 25 nurses' station |
| 13 office | 26 visitors |
| | 27 nurse's bedroom |

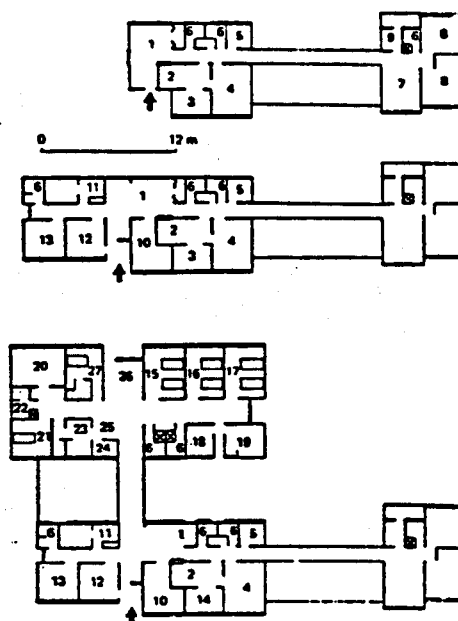


Figure 7.3: Columbia, Source: (25)

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4. Kenya: (fig. 7.4)

a. standard room size

b. central corridor system with separate buildings attached to the corridor

c. each block has scope for extension at one side and one direction only

d. staged growth of dispensary I to II and to health centre

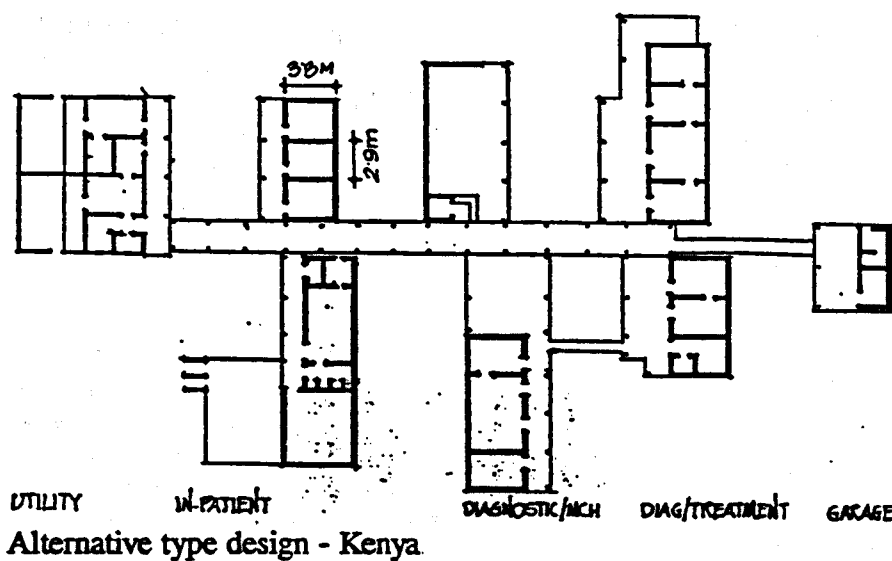
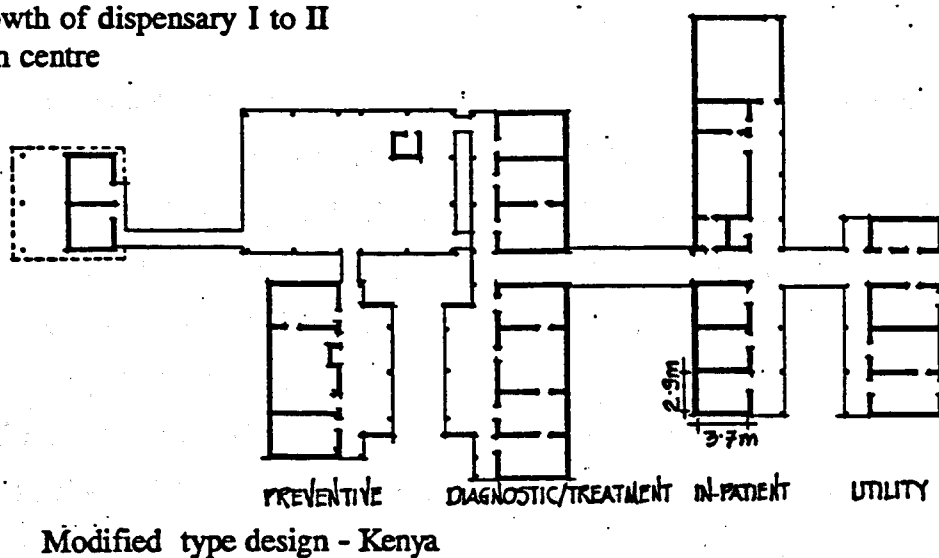


Figure 7.4, Kenya. Source: (93)

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Following the above studies different approaches are identified to accommodate growth, change, phasing and flexibility in the planning and design process:

1. Modular Planning and standardisation of dimensions:

"Design based on modules offers the greatest scope for adapting to the functional changes demanded of a health unit throughout its life time." (49)

A study was conducted by John Weeks et al to "discover which intervals seem to occur in hospitals by measuring the room size distribution found in existing buildings or buildings ready for construction." (125, p.227) The study was conducted on six U.K. teaching hospitals. This analysis showed that the most common rooms in all of them have similar room sizes although with different overall distribution pattern in each. The six most common sizes occurred as a whole among the 20 most common room sizes in every individual hospital are 120, 100, 150, 200, 50 and 40 sq.ft. About 80% fall within the most common sizes.

The findings of the study on room size tend to support Cowan's 'studies in the growth, change and ageing of buildings'. His work encouraged a generalised and flexible layout design and supported two assertions:

1. that the majority of a hospital's activities can be successfully accommodated in a relatively small number of different-sized rooms; and
2. that most of these sizes will be between about 50 and 250 square ft - the majority less than about 200 sq ft.(125) (see Fig.7.5)

Relative frequencies of the most common room sizes in the six study hospitals, shown together with Cowan's theoretical distribution. Common room sizes for individual hospitals were included in this analysis if they occurred among the 20 most common room sizes for at least three of the six hospitals.

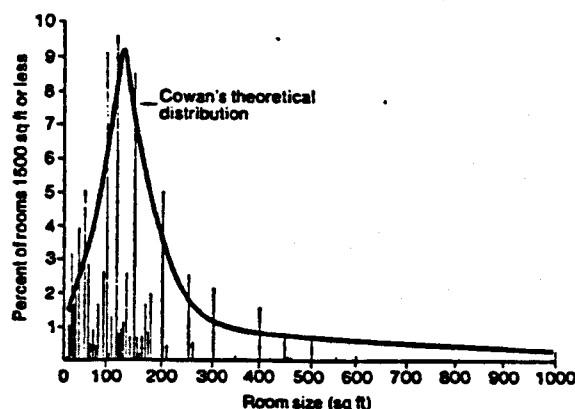


Figure 7.5 Room size distribution, Source: (23)

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The aim of many "modular" or "dimensionally co-ordinated" approaches to hospital planning is of some degree of variety reduction and naturalisation. After analysing room size, the next attempt at the study by J. Weeks was to determine "how such a limited number of floor-area allowances might be generated from a series of structurally and anthropometrically convenient linear dimensions". (125, p.236) These dimensions are shown in the Fig.7.6. The hospital planning module based on such dimensions is a 24 ft structural grid systematically subdivided to offer a variety of planning dimensions and room shapes. Such an approach to variety reduction in room sizes results in a small number of room sizes and shapes by using repetitive dimensions.

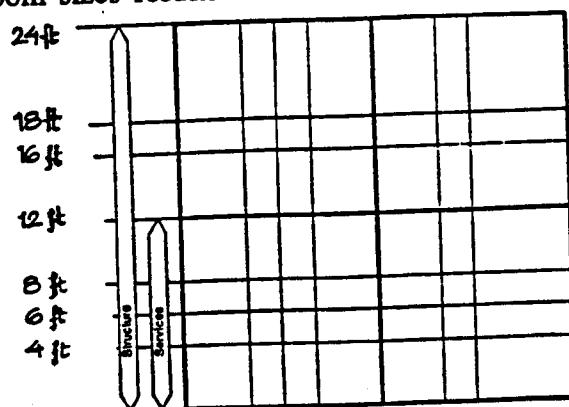
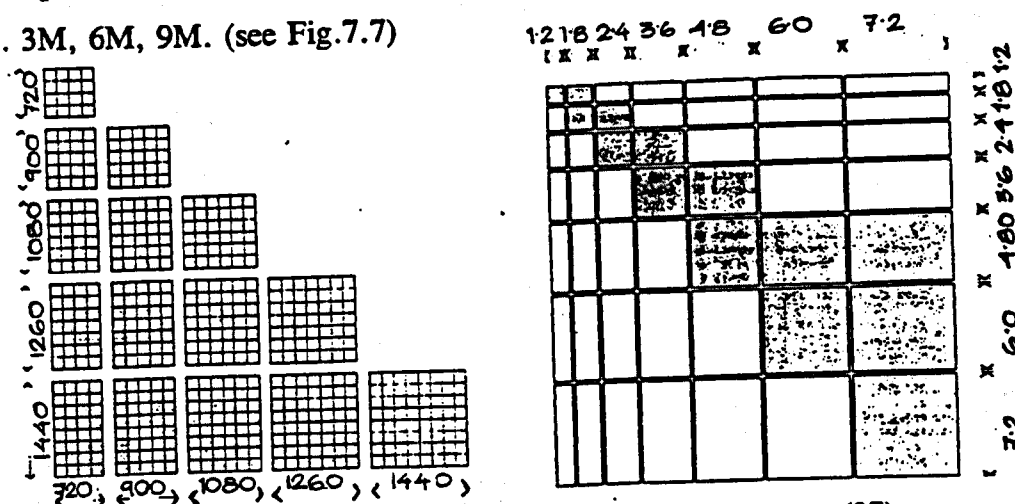


Figure 7.6: Dimensional Co-ordination, Source: (125)

Various modules have been developed so far to standardise health care building construction and planning. A 10 cm (4") module and a planning grid has been accepted internationally as a preferred dimension and basic module (1 M). Multiples of the basic module are also used i.e. 3M, 6M, 9M. (see Fig.7.7)



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The following modules have been adopted in a number of hospitals with a great deal of success: 7.2mx 7.2m (24'x24') or 6.6mx6.6m (22'x22'), subdivided by 60cm(2') or 55cm(1'10'') on a planning grid. A standard space module used throughout the building would ensure compatibility between structure, room dimensions, service facilities and fittings and it would help co-ordinate a detailed space programme, making for a more efficient and economical use of space.(110)

Exceptions can be made for those spaces like stairs, toilets and so on which do not conform to the modules used. These spaces can be planned independently following a systematic method. Care should be given so that their size and location do not affect the growth possibilities of the rest of the spaces.

2. Use of multi-purpose space and inter-changeability of space use:

A standard room can accommodate a large number of different activities better than a tailor made single purpose room. Standardisation of similar activity spaces/ rooms used at different levels and within the unit can be used to accommodate changes. The use of standard consultation/ examination room, a modular building frame and a linear open-ended layout are useful for easy growth. It is usually done by adding one or more complete structural modules.

3. Communication system and circulation pattern:

This is a most important factor in controlling and directing building growth. Each and every space need connection to this communication network to be fully functional and to maintain inter space relationship.

The major public corridor in a health care building can be compared to a village street, serving the whole complex. The street should be capable of extension without distortion. Any simple plan shape with free ends is useful, but closed shapes are not. These streets should be recognisable, be a core of health care building and give access to every part.(122)

"The possibility of expansion increases with the type of circulation patterns (smallest for radial patterns, greatest for grid patterns) and with an increasing number of open ends and growth possibilities in these patterns and in general it is easier to expand low buildings than high buildings." (27, p.97)

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A wise planning and design of appropriate communication or circulation routes is essential to achieve growth of the health care unit without disruption of the original layout. Both growth and phasing are to a high degree dependent on the circulation patterns that form the basis of the building type. The distance between functionally interrelated areas should be kept as short as possible. There should be minimum conflict in the movement of patient, staff and visitors.

7.1.2 Building size, shape and layout:

Following the methods used by Weeks and Cowan a survey of room size distribution has been made in twelve UHCs. As the plans selected represent the majority of available type designs, the result is hoped to give an overall picture of existing facilities. The most commonly occurring room sizes and their percentage of occurrence are analysed from the study.(see Fig.7.8 and Table 7-1)

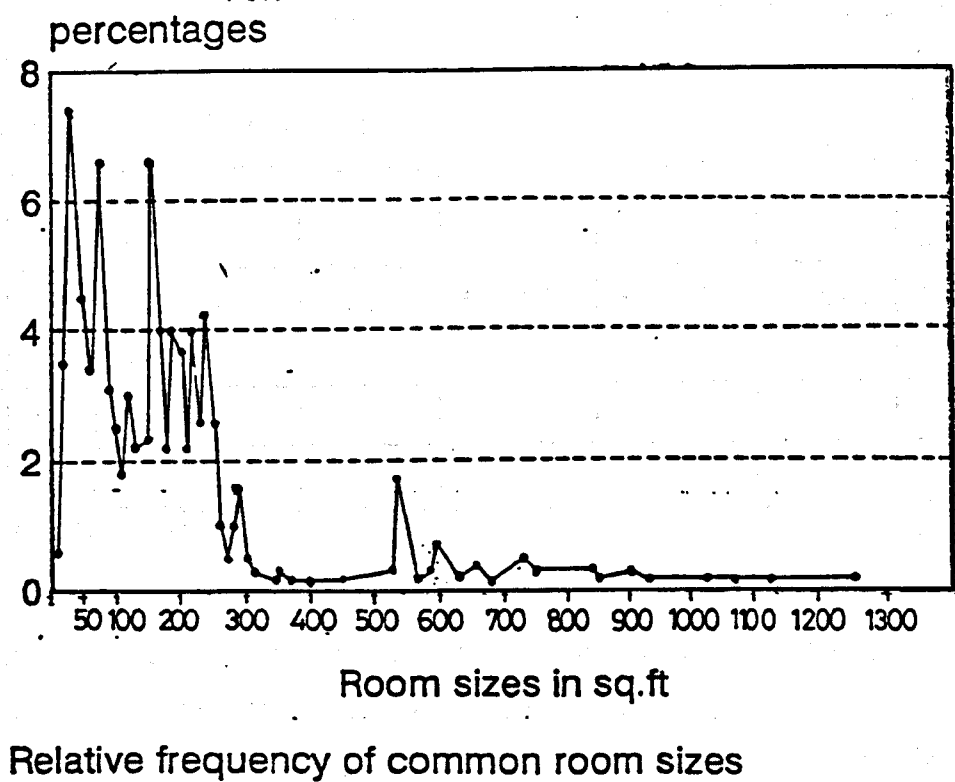


Figure 7.8 Room size distribution in 12 UHCs

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0-50sft	50-100	100-150	150-200	200-250	250+	> 200	> 250
23.4%	19.0%	11.8%	22.8%	15.6%	7.25%	77.1%	92.7%

Table 7-1: Room size distribution in 12 UHCs

The study shows that 92.7% of the areas fall below 250 sft and 77.1% below 200 sft.

After analysing room size distribution in different UHCs and UHFWCs, it becomes apparent that it is possible to generalise areas which occur frequently and also to establish a relation between different areas.

It is also important to analyse room sizes along with room areas. An analysis has also been done on types of activity areas which are dominant in an individual department or activity space group. e.g. C/E room, bed-bays, O.T (Table 7-2). For the purpose of this study these areas will be termed as common activity or simply activity components. In the majority of cases, these are used to determine the size of an organisation and workload calculation. These sizes are based on activity analyses, ergonomic studies, furniture and equipment size and room data developed for such units in the briefing stage.

Consulta./ Examinat.	Bed-bays	O.T.	Delivery	Laborat- ory	X-Ray	Treatment in metre
3.6mx3.6	1.2x6.0(6 bed)	4.8x4.8	3.6x4.8	3.6x4.8	3.6x4.8	3.6x4.8
3.0x4.8	3.6x4.8(3 bed)					
3.0x4.2	2.4x3.6(single)					
3.6x4.8						

Table 7-2: Room size and shape

The analysis is also supported by published guidance on areas for different developing countries. Although space standards may vary from country to country, it will provide useful information in case of inadequate research on space standards.

From the study a size of 1.2m is chosen as a convenient module. This is based on the commonly occurring linear dimension in each activity component, using minimum acceptable

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standards. Multiples of this module 2.4, 3.6, 4.8, 6.0, 7.2 can be used to derive room sizes of various functional units. This grid will be used to place all major internal and external walls avoiding a complicated structural system and a large number of varied room sizes. By adopting these sizes the expense of internal alterations can be reduced and interchangeability between rooms can be increased. The width of the individual blocks/building will be decided based on three major factors:

1. to ensure natural light and ventilation
2. to provide economic structural system
3. functional suitability

For a ward block it is worked out from room data with 3 and 6 bed bay units that a suitable width to accommodate beds, ensuring intended operations and activities can be 8.4m including verandah. This width is suitable to accommodate most medical functions, economic roof construction and also to ensure natural light and cross ventilation. The form of the building will be mostly single-banked to accommodate the climatic need of Bangladesh.

The length of individual building blocks will be determined by the functional need of concerned areas or departments e.g. in- patient areas by size of nursing unit.

7.1.3 Environmental considerations:

Health care buildings as a shelter and modifier of outside climatic conditions should provide comfortable working, visiting and living conditions for patients, staff and other users. The aim is to achieve a comfortable indoor environment for the users using natural sources and avoiding mechanical methods to save energy.

"The function of the shelter or building is to provide an internal environment in which the body can maintain its heat balance to work efficiently and rest comfortably."(111, p.122)

Bangladesh is characterised by hot and humid summers and cool, dry winters with daily average maximum of 35 C in summer and minimum of 10-15 C in winter. Rain fall occurs during monsoon (max 4700mm, min. 1500mm). There are regional variations. During summer months(April to October), temperature and humidity for day and night remains above comfort

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zone. In winter (November to March), the combination of relative humidity and air temperature during day and night remains within and below comfort zone. From December to January the night time temperature remains below comfort zone. (92)

The important climatic elements like solar radiation and temperature, humidity, prevailing wind and rain can be controlled and modified by building elements (e.g. roof, walls, floors), materials, finishes, form and orientation. Thus to control and modify the effects of climatic elements for achieving comfortable indoor environment by efficient choice and design of building and elements, the following methods are identified.

a. Cross ventilation for air movement:

To provide comfort during high summer temperature and humidity, adequate air flow within the building is essential. During warm weather evaporation of perspiration from the human body saturates surrounding air. Unless the air is removed, either by natural ways of cross ventilation or by mechanical ways by electric fan/ mechanical ventilation, the person feels uncomfortable. Mechanical ventilation depending on electricity supply is not possible at HP, UHFWC and also not feasible at UHC due to frequent power failure. Natural ways of ensuring cross ventilation for air movements by the right choice of building materials, elements and orientation is of prime importance. Factors like rain and dust penetration, heat, glare and cold wind during winter need to be considered at the same time. Thus it is not considered an absolute rule to place buildings perpendicularly to the prevailing wind direction as "wind velocity is not greatly reduced upto an angle of 60 from the perpendicular." (111, p.125)

" While solar radiation, particularly its exclusion from an indoor space can be dealt with in many ways other than through the manipulation of the orientation of the facade with openings, the prevailing wind cannot be dealt with for effective cross ventilation without securing the right orientation for the facade with openings in relation to the prevailing wind." (92, p.144)

It is preferred that in the case of conflict between the requirements of for sun and wind, wind should be given preference.

To achieve maximum cross ventilation the following measures can be taken.

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- alignment of the building in accordance with the prevailing wind.
- selection of a raised site un-obstructed by other nearby buildings or part of the building.
- use of properly designed openings, interior partition and room height utilising air movement at user level.
- use of vegetation to regulate air flow.
- to facilitate maximum benefit from prevailing wind, individual buildings to be placed with adequate in-between spaces, if possible in a staggered/ chequerboard layout.
- optimum ventilation can be ensured in a built form of single room depth with openings on two opposite walls, preferably outlet larger than the inlet. A verandah may also be provided with openings in the partition wall.

b. Protection against heat gain from radiation:

Protection from direct sunlight by shading of roof and facades can reduce solar heat gain and so save energy used in cooling. The roof design needs particular attention as it receives maximum solar radiation, especially during long summer day time.

Suggested measures are:

- extended roof or use of verandah or semi-open areas to protect wall surface.
- double roof or roof space ventilation
- alignment of the building with long axis to east-west.
- use of lightweight materials which do not retain heat for walls and ceiling construction.
- use of louvers or other shading elements- horizontal, vertical or mixed can be manipulated in different ways to shade openings and facades.
- vegetation can also protect the building from direct and reflected solar radiation.

c. Protection against rain penetration:

The rainfall or precipitation influences both temperature and humidity. It is necessary to protect health buildings from driving rain and to dispose of drainage water. The shape and

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material of roofs is important in relation to rain protection and drainage.

d. Others:

1. Natural disasters(e.g. flood) Changes in climate, flood, cyclone and like disasters need sound construction, maintenance and use of buildings in the vulnerable areas.
2. Hygienic considerations: high temperature can cause intense odours from sanitary facilities. The location of areas that produce odour nuisance should be on the leeward side. The planning of sanitary and washing facilities outside the ward areas and other activity zones is essential.
3. Building design, details and devices:
 - a. Mosquito nets, if dirty, reduce air movement to 80%- 90%.(70)
 - b. Ceiling fan can give certain relief.
 - c. Use of shading devices can help to protect privacy of overlooking treatment and ward areas.
 - d. Balconies in the form of long walkways and courtyards can be used as circulation routes and accommodation areas for the visitors.
 - e. Courtyards induce ventilation and hence cooling using the stack effect. (111)
 - f. "In tropical areas it is much easier than in temperate zone for solar collectors to provide a fully operational, domestic hot water supply. This can be as simple as an oil drum filled with water, painted black, placed on the roof and fitted with a shower rose on the underneath." (70)

7.1.4 Use of local technology and material:

Use of local materials and techniques is recommended in order to meet local requirements with respect to climate and topography, to accord with local vernacular and traditional architecture and to be cost effective.

"....traditional buildings reflect a society in harmony with its environment. But, after all, such buildings represent the accumulation of centuries of assimilated wisdom in the techniques of transforming local materials into shelter for the community." (85, p.12)

A wide range of building materials are used in different combination in Bangladesh to produce permanent (pucca), semipermanent (semi pucca) and temporary (kutcha) buildings.

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Brick, sand, cement, m/s rod are the chief building materials for permanent structures whereas thatch, bamboo and mud are for temporary structures.

The most available and widely used building material in Bangladesh is burnt brick. Bricks are graded into picket, 1st, 2nd and 3rd class. Picket bricks are used for making brick chips, 1st class for load bearing walls and 2nd class for non load bearing walls. According to practice 3rd class are rejected and should not be allowed in use other than making temporary site structures.

Sand, available in different qualities and of various grades, is ample and available round the year. This material mixed with cement in different proportions is used as mortar for laying bricks and plastering.

Normal Portland cement manufactured locally from limestone and clinker are available but only meet 35% (1986) of local consumption. So naturally these are imported from various countries in exchange of valuable foreign currency. The price fluctuates according to supply and demand.

Mild steel (m/s) rod, an expensive material, is manufactured locally in different rerolling mills from imported 'billet' and 'ingot'. It costs around 35-40% of the total cost of reinforced cement concrete (RCC). Sand, cement and brick chips are mixed in certain proportion to make cement concrete and cast in timber shuttering with mild steel reinforcement to make RCC, an essential material for making flat roof, stair, lintel and shading devices.

Galvanised Corrugated Iron (GCI) sheet is one of the most popular building materials, locally produced and available throughout the country. It can be used for making roofs, walls and even doors and windows. Timber of different quality is generally used for making trusses and purlins for C.I. sheet roof, door and window frames and shutters and posts. The general lack of adequate treatment and seasoning causes defects and maintenance problems. Bamboo, one of the most important and cheapest building materials, can be used as post (borak) and mats (muli) for making walls, roofs, doors and windows. Untreated bamboos are susceptible to decay and damages due to wind, rain, flooding and have only 3-4 years life span.

Other materials (e.g. mud and thatch) are used in semi-permanent and temporary

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structures for making walls and roofs respectively. Mud/ earth though easily available, are not resistant to heavy rains, takes long construction time, demand thicker wall and constant maintenance throughout its life. It is found out in a study by SKAT (114) that-

"Although earth construction is widely used in parts of Bangladesh, it would probably be very difficult to improve its quality or extend its use. Stabilised earth is not a marketable product while earth construction is an art which requires intensive training based on traditional experience." (114, p.4)

Lime and lime surkhi mortar were used as principal cementing material from ancient time and proved to be sound and intact. But only 5% of supply needed were available from local lime stone.

The most common type of permanent building construction is either load bearing brick wall and flat RCC roof or of RCC column and beam with a slab. The brick walls are of 10" and 5" thick. The choice between two methods are mostly dictated by soil condition and height of the building.

The construction method is labour oriented. Other than a few mixing machines, vibrator and small hand tools, almost all the works are done by hand, from site clearing, soil excavation, brick carrying, washing, laying, placing shuttering, binding rods, casting, plastering, electrical and all plumbing works. The use of labour intensive method, using large number of unemployed man-power and to mobilise self-help capabilities is essential for Bangladesh.

For poor road and other communication network, especially at the union and ward level, carrying of construction materials, access to the site and services can become very cumbersome and simultaneously expensive. Sometimes the only means is the river network, for which one has to wait till the rainy season, which in turn is not suitable to commence construction work.

Imported materials are likely to be expensive, difficult to transport to remote areas and may cause delay. These are also expensive to maintain in the long run. Thus it is necessary to reduce dependence on imported materials. Also prefabrication is difficult to achieve at this level for high capital cost, transportation problems and possible rates of utilisation.

According to R. Hossain (51) planners and designers should recognise the difference in quality of construction methods at National and Local level and set design proposals accordingly.

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Construction methods used for public buildings at local (e.g. union, upazilla, district) are "age old, inefficient and under supervision of less skilled staff" (51, p.361) as compared to sophisticated method used at national level (e.g. cities). For small scale projects (e.g. HP, UHFWCs and UHCs) sophisticated methods are not feasible either due to high cost, difficulty in transferring materials and equipments to remote areas and shortage of skilled manpower.

Health buildings, being a special kind of facility, a number of factors for the choice of materials and technology need to be considered along with their cost effectiveness. These are the following:

- suitability with respect to hygiene
- suitability for efficient functioning and space requirements
- adaptability for later change of functions
- expansion possibilities
- durability of building materials
- resistance against natural disasters

Thus the choice of material and technology should carefully avoid temporary, less longevity, susceptible to wear and tear, frequent maintenance requirement.

"A carefully combined use of the first and secondary category of building material will tend to a lower overall cost yet with good quality finish." (70, p.365)

It is also essential to "set up research and development bodies capable of finding original ways of making building materials and using them economically that can be easily learnt by local populations." (50, p.87)

Certain activities have already been started and proposed from government and private initiatives on alternative building material and technology. The House Building Research Institute (HBRI) has introduced different alternative materials to economise overall cost. For example as a substitute for cement clay pozzolana (mixture of surki/burnt clay dust, free lime and water), rice husk cement (rice husk ash powder with cement or lime) and iron slag cement (5% iron slag blended with portland cement) can reduce cost substantially. By rationalizing storage, handling and use in construction can save this material, as 5-10% of total cement consumption get damaged due to improper storage or keeping the stock for longer time. Again if the surfaces

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have good finish may not require plaster and paint outside.

The HBRI has also introduced, a less expensive alternative for RCC roof slab, Ferro-cement channels, which can be used by layman. Ferro cement water tank is another attempt and popular in both public and private sectors involving low skilled personnel. Money can also be saved by improving technical know-how, saving energy, cost of raw materials. Gas as fuel can save energy for producing bricks. Reinforced brick work for roof, lintels and beams can be used instead of RCC to reduce cost. Plastering with sand cement materials on bamboo mat walls improve the durability and can be used as partition wall, popular in sylhet.

A sector study on "Building Materials in Bangladesh" (114), prepared on behalf of SDC (Swiss Development Co-operation) by SKAT (Swiss Centre for Appropriate Technology), set proposals for the effective promotion of alternative and / or improved building materials and employment creation. As a first priority they identified the unique potential of brick making and bamboo construction.

7.1.5 Water supply, sewage disposal and drainage:

Environmental sanitation includes provision of an adequate supply of safe drinking water, excreta disposal and the control of insect and animal vectors of diseases.

The insanitary sewage disposal system is caused mostly by inadequate water supply, sanitation facilities, economic condition and lack of knowledge on the part of the users. Sources of water supply may become contaminated from insanitary sewage disposal of infected human faeces and thus accelerate spread of parasitic, intestinal and communicable diseases (e.g. diarrhoea, dysentery, hookworm, typhoid and so on). To improve this situation needs general improvement of hygienic conditions of people through better sanitation and practices. The role of PHC facilities in this area are:

- provide health education from the centres and at field level.
- set example through their facilities
- regular supervision and maintenance of the facilities
- design of facilities responsive to available water supply and maintenance

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possibilities.

One of the important factors is to decide on the location of sanitary facilities with respect to sources of water supply. It is recommended by Wagner and Lanoix (119) to locate the privy downhill and to avoid placing it directly uphill from a well. Where the condition is unavoidable a 15m distance will prevent bacterial pollution of the well. Depending on soil condition this distance may vary. Human factors like maintaining privacy, separate facilities for men and women, squat type as against water-flush type with riser and seats are needed to be considered. Regular maintenance of sanitary facility by providing smooth, hard and washable surfaces is important to maintain better hygienic conditions. Also the number of latrine in relation to users has an important bearing on its use and cleanliness.(see Appendix. A-4.1)

It is also essential to provide facilities for clinical hand washing near examination, treatment, dressing and operating areas. In the UHCs it is feasible to provide hand-wash basins near these areas. For UHFWCs and Health Posts, where running water is not available, a bowl with water and disinfectant should be the minimum provision. (96)

7.1.6 Traffic movement and circulation:

The objective is to provide a circulation pattern considering the traffic movement in PHC facilities so that the users can have quick and obvious routes to areas needed for individual activities.

The volume of traffic and flow pattern of out-patients, their escorts and visitors in most of the out-patient areas and in a number of in-patient areas were found to inhibit the normal work flow. The problem is not that acute in the newly designed UHFWCs, as being small in scale and all the activities are within one block.

In UHC out-patient areas the majority of patients come directly without any prior appointment to see the doctor. The lack of a filter system, proper waiting areas, inadequate guidance and call systems lead patients to gather together either within the clinics or in front of the clinic doors within the corridor. This is also enhanced by the provision of waiting and clinic areas in two different places without any visual contact.

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The concept of receiving patients at a health post, health centres and filter clinics in UHC can reduce this traffic to a large extent allowing only those requiring the skill of doctors to proceed. The method of separating different types of traffic, out-patient, in-patient, staff, visitors, supplies as far as practicable reduces the chances of unnecessary conflicts among different groups.

Certain methods are found to be important to consider during the design phase in order to achieve the desired objectives:

- determine the main areas and relationship between them e.g. for UHCs these areas are out-patient, in-patient, diagnostic and treatment, administration and support services.
- the space utilisation pattern and activity sequences. This information will help to keep most related areas close to each other, confining traffic within those areas.
- timing of utilisation is also helpful to decide circulation route. Like out-patient areas are used from 8.00 am to 2 pm and will generate most of the traffic. On the other hand in-patient visitors can be allowed to visit outside this hour to keep traffic movement within control.
- clear separation of out-patient and in-patient traffic. Out patient traffic should be confined within out-patient areas and certain parts of the diagnostic and treatment area to minimise such conflict with in-patient and other traffic.
- visitors of in-patients should be routed directly to in-patient areas. The time of visiting can be manipulated to the advantage of reducing inter traffic conflict, as for example clear distinction between out-patient and visiting hours. The timing of those attending patients in wards can not be restricted and should be considered separately from other visitors.
- efficient movement of supplies, services and disposals throughout the whole health care building. These should have separate access with outside.

7.1.7 Social, cultural, religious and traditional considerations:

The implications of social, cultural and religious traditions in the design strategy and

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process should get due importance so that the health buildings can meet the desires and aspirations of the users. From the survey and analyses of existing facilities the following areas are identified:

1. Male-Female Segregation:

The cultural and religious practices of Bangladeshi people demand male-female segregation in different degrees in different spaces. In out-patient areas they need separate waiting areas so that mothers can feed their infants in privacy while waiting. Although it is desirable to have female doctors for female patients, it may not be feasible in all clinical areas due to the lack of available staff. At least in certain areas, like MCH and F.P. cases female staff can be provided at the first contact point. In the wards complete visual separation between male-female accommodation is essential. This practice may reduce the flexibility of bed use by considering different rate of utilisation. In such a case smaller grouping of beds instead of a fixed number for each sex in one open area might be a feasible solution. The same principle of male-female segregation applies to sanitary facilities, their location and entry points. In some areas like health education class, where separate accommodation is not possible, use of timetable or shifts can be applied.

2. Privacy and confidentiality:

Privacy and confidentiality of patients also demands due consideration in the design process. In some places it may need only visual separation, while in others both visual and vocal privacy is essential. Visual privacy is particularly important when a patient is undergoing examination and treatment. Also in in-patient accommodation or wards a certain degree of privacy should be provided. During out-patient consultation it becomes difficult to express personal problems in front of other people, especially for family planning and maternity cases, inadequate privacy and confidentiality may hinder the patients acceptance of care. In general, rural women are shy and to be noticed by known people will mean that they cannot express their problems freely. The location of such areas in relation to other areas, choice of materials and

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dividers between spaces should retain privacy and confidentiality of patients.

3. Religion:

Being predominantly a Muslim country (86.6%), Islamic practices are given priority in public buildings. One of these practices is the male-female segregation, females examined by female staff as discussed in the earlier section. Religion also dictates the orientation of toilet fixtures, like w.c.'s are not acceptable to be west facing. It is also a normal practice to use water in the w.c's. For ablution before prayer people need a source of water and a floor-trap instead of a normal hand wash basin. In-patients being confined in bed may use bed space for daily prayer. For staff and attendants the decision will be based on available facilities within walking distance.

4. Food habit:

Food is provided to the in-patients at the Upazilla level, three times a day. It was observed that the majority of the in-patients, being from a low economic background accept the food provided from the complex. They need hot meals for lunch and dinner served on individual plates.

Patients visitors also bring food from home or buy from outside shops. At Upazilla level food is available from nearby roadside shops and patients visitors are not allowed to cook within the health complex area. It is also not feasible for management problems and scarcity of available land. At least certain provision should be made for their having food and washing dishes.

5. Patients attendants and visitors:

It is the normal practice for patients relatives, for example mothers of children to stay with the patients, at least one for each in-patient. They also participate in certain activities, like feeding patients, assisting with dressing, changing, toileting and overall supervision. Within the resource constraint it is neither feasible nor affordable to provide for their accommodation. At

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least certain shared facilities like dining areas and sanitary facilities can be provided to maintain the hygiene of the whole site.

Receiving a large volume of daily visitors in in-patient areas is a common practice. Design should give adequate consideration to minimise conflict between visitors and working staff. Location of staff working areas and visitors routes should have clear separation. Also to minimise litter all over the complex, their movement should be clearly directed from entry towards wards.

6. Security:

Security of patients and staff is also important in the country's context. Every year the loss occurring due to stealing of furniture, equipment and even patients personal belongings is substantial. The problem is most acute in the health centres, mostly because of their location and lack of any boundary walls. Staff also complain of being threatened by local youngsters and also cannot control their free access. Security can be achieved to a certain extent by appropriate layout, ensuring control over traffic movement, zoning of public, semi-public, private and restricted zones and boundary walls.

7.1.8 Economic Considerations:

The aim of the design should be to reduce future building maintenance as part of the running cost of health buildings. It is true that if high standards of staffing, building and equipment are set disregarding their running and maintenance costs the life cycle cost will be high. On the other hand careful and systematic planning and design of spaces, space organisation, choice of construction materials, finishes and methods can substantially reduce these costs. The purpose is to reduce overall cost without impairing the quality of care. The implication of using different categories of staff to increase their efficiency and reduce running costs has already been discussed in the planning guidelines.

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Construction cost:

Certain standards need to be set beforehand regarding the quality of construction work. The trend for cutting construction costs through using poor quality bricks, concrete, unseasoned timber, reduced reinforcement, bad proportion mortar and so on needs to be checked. Otherwise the result is irreparable defects, cracks in brick walls, roofs and beams. In this aspect the judgement should be made based on life time maintenance costs compared with initial capital cost. The following guidelines are suggested:

- use of local material and technology and less skilled labour as against imported material, precast and sophisticated technology.
- building material constitutes 65-70% of total construction cost, any savings in materials will significantly reduce construction cost. In this respect the use of local materials, as identified under local 'technology and material', should be given priority.
- stock of material during lean period and to utilize in need.
- construction during dry period to save man-hour.
- It should also be kept in mind that the building will grow and change with time. Unless the construction method and system are adaptable to these changes, they will subsequently increase the overall cost.
- mass manufacture of components like doors, windows as well as furniture and fittings can save money.
- one way to cut initial construction cost is to phase the development over a number of years for limited available material and money.

Maintenance cost:

To reduce the maintenance cost it is important to select carefully building and finish materials, fittings and fixtures, furniture and equipments which are durable requiring less repair, alteration and replacement during their life time. Also regular maintenance policy need to be formulated and a team/organisation should be responsible to carry out the maintenance work. Certain responsibility should also be assigned to the users of the buildings to keep those clean

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and well maintained.

From a design point of view the following areas are identified for attention:

- to use all the spaces to maximise efficiency to fulfil the functional needs of those spaces. Thus to reduce the possibility of misuse of spaces or over provision. Multi-use of spaces should be encouraged.
- to keep functionally related areas close together to reduce walking distances which will reduce the workload of staff. It may also help to share staff in case of need.
- complicated layout can increase overall surface area, as high rise solution compared to low rise. Savings by proper sizing of spaces can be substantial.

The nature of the study involves only to a schematic design, as mentioned under scope of work in Chapter Three, without going into preparing detail designs and working drawings. To compute the cost of a structure which deals with some new materials and techniques needs a lot of ground work, working drawings, manpower and most of all time. This can turn-out to be an individual research. Based on thumb rules, a total cost can be calculated, but the authenticity of which will still be in question.

7.2.0 DESIGN DEVELOPMENT

7.2.1: Design Concept:

The overview of the country's health and health services and the analysis and evaluation of existing buildings reveals that the vast number of units already built and running with a multitude of physical and functional problems cannot be denied. The majority of these units are designed as type plans. If the proposal is for a complete unit or type plan designed to serve immediate need, similar problems will arise.

Thus it is essential to decide on design principles and strategies which can have the universal effect for varied kinds of building programmes, serving different levels of PHC facilities. The design concept should thus fulfil the options available for physical planning:

1. construction on a new site
2. extension of an existing unit

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3. up gradation

The question is thus whether the design proposals will encompass

- design based on individual activity data
- design based on individual room data
- type designs of individual parts (e.g. wards, out-patient areas, O.T. and so on)
- type designs of individual units (Health Post, UHFWC, UHC)
- one-off solutions

Activity data and room data:

It is too laborious a job to compile, present and retrieve individual activity and room data which needs skilled manpower to maintain such a system. In developed countries this task is usually done using the computer (eg. ADM). Often such a collection of data becomes so big, that the designers and users of these data feel reluctant to use them.

With the changes in need, demand and subsequently the facilities, all of these may need revision, dropping of some and inclusion and changes in others. Even in the U.K. the system of producing vast amounts of guidance is becoming questionable regarding its use and demand for up dating of information. To provide up to date data needs an on going process of data collection requiring skilled manpower, time and money which is not feasible for Bangladesh. But the importance of these as design tools can not be denied. For this study room data for key areas (e.g. C/E room, bed-bays, treatment, laboratory) are found essential to determine size of an individual department or activity space group.

Type designs - whole complex and departmental type designs:

Problems here are mainly related to growth. Type plans preconceive of growth as expansion in equal units (e.g. Sudan). This is difficult to justify due to the very nature of growth and change as indeterminate. Type designs also lack consideration of regional variations, topography and site size and shape. Again in type design it is hard to change shape.

"Once the basic shape is altered, it is no longer a type plan." (51)

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Designing all the units as individual/ "one-off" building:

It is not feasible as the programme encompasses a large number of units scattered throughout the country. It will be time consuming to design and build individual units requiring more skilled staff. On the other hand it is clearly evident from survey analyses that each unit will grow and change with the available resources and in response to growing needs and demands. As it is not possible to design each as an individual project, a flexible and adaptable building strategy is considered. The strategy is to plan from the outset a minimum provision meeting the demands of immediate needs and at the same time plan and provide scope for future extension for foreseeable and unpredictable demand for changes and growth. It should also have scope for all necessary changes. As it is difficult to predetermine the actual frequency and amount of growth, at least direction of growth can be indicated. Option should be there to grow in small and large increments. The minimum provision should be planned to be developed in a phased manner to the higher level of facilities. So the approach should be to provide guidance which can be used for varying conditions:

- designing a new unit on a new site
- extending a minimum unit to the next upper level by phased construction
- upgrading existing units, using planning and design principles
- adding required services and facilities to the existing facilities.

It cannot be strictly said that all health posts will grow to health centres and health centres to health complexes. But depending on available resources (money, manpower and facilities), strategic location, available site area and communication network a number of them may grow to next higher level. The construction of a completely new facility on a new site involves major capital investment with new site infrastructure.

This strategy and consequently the design guide should provide essential ground work for all the varying conditions and options mentioned above.

7.2.2 Design guidance format and method:

The aim of the design guidance is to assist the design team in understanding the problems

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and design strategies and consequently furnishing them with design requirements which can be used for designing new premises, upgrading or expanding existing PHC facilities. The design team will consist of architect, engineer, quantity surveyor working in a private consulting firm or public works department. The guidance is based on analysis and evaluation of existing facilities with an attempt to identify problem areas, users requirements and priorities. It is hoped that this guidance will provide the essential ground work to be used to meet immediate needs and also flexible enough to provide scope for future development.

It was realised within the changing scene of health services and facilities, activity based detail for each individual room requirement might provide a tailor made design that may become obsolete after some time. Thus to meet future needs and changes in requirements, a more rational approach to reduce varied room size and to increase interchangeability of spaces is adopted.

Benefits of using systematic design approaches:

- design based on evaluation and analysis of existing facilities, identification of problem areas, users needs and priorities would provide scope to meet immediate needs, operational efficiency and functionally and physically suitable building.
- the operational policies and organisational principles set in the previous chapter based on a systematic method would provide the essential ground work on which to base the design guidance.
- such an approach to achieve efficient space utilisation would result in reducing building, running and maintenance cost.
- save time of the design team by using the guidance to meet different design requirements in varied site conditions: new, phased, expansion and up gradation at different levels of PHC facilities.
- the flexible design approach and phased construction would enable the building to meet changes and expansion possibilities.

A method of preparing design guidelines based on planning guidelines, developed in the previous chapter will follow a systematic step by step approach. The format/ structure and

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content is selected carefully to include the required design information needed by the design team. Following the design strategies, an attempt has been made to provide guidance on each activity component.

1. Aims and objectives
2. Functions
3. Participants
4. Furniture and equipment(fixes, movable)
5. Size and area
6. Location and interspace relationship
7. Environment
8. Services
9. Criteria: privacy, noise,
10. Finishes
11. any note

The design guidance in conjunction with the planning guidance will provide for the design team a comprehensive picture of the organisation and design tools to be used for individual project.

7.2.3 Activity grouping and inter-relationship:

The aim is to achieve an optimum pattern of relationships among the functional areas of the individual health buildings determining the correct location of each area in relation to the other, reducing traffic movement and making traffic flow as reliable as possible. While grouping different activities or zoning of functional areas, the following aspects should be given priority:

- functional efficiency of each activity and interrelated activities.
- easy supervision of traffic movement
- maintaining privacy and security as required.

Inter-relationship of activity spaces depends to a great extent on traffic pattern. Different methods can be used to determine traffic pattern, one of which is the use of Traffic Matrix. The activity grouping and inter- relationship of different levels of PHC buildings are discussed below.

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There are mainly two different categories of traffic within the health centre:

- patient with escort
- staff

In the design a clear distinction is necessary between these two groups. The analysis of different activities, sequences of activities and the resulting space implication reveals that the functions can be divided into three distinct zones:

The public zone: entrance, waiting, children's play area etc.

The joint use zone: consultation, examination, treatment with reception, toilet, drinking water facility etc.

The staff zone: store, record keeping, simple laboratory test, drug store, staff accommodation (separate building)

It is essential to maintain a suitable relationship between these three zones as well as the relationship of spaces within each zone. There are three different traffic within the UHCs. eg.

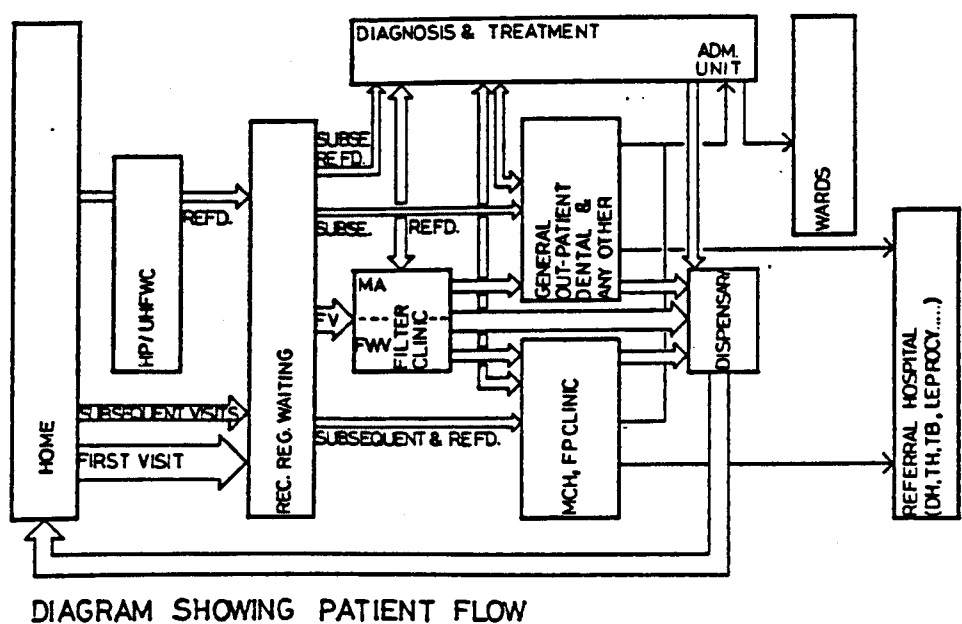
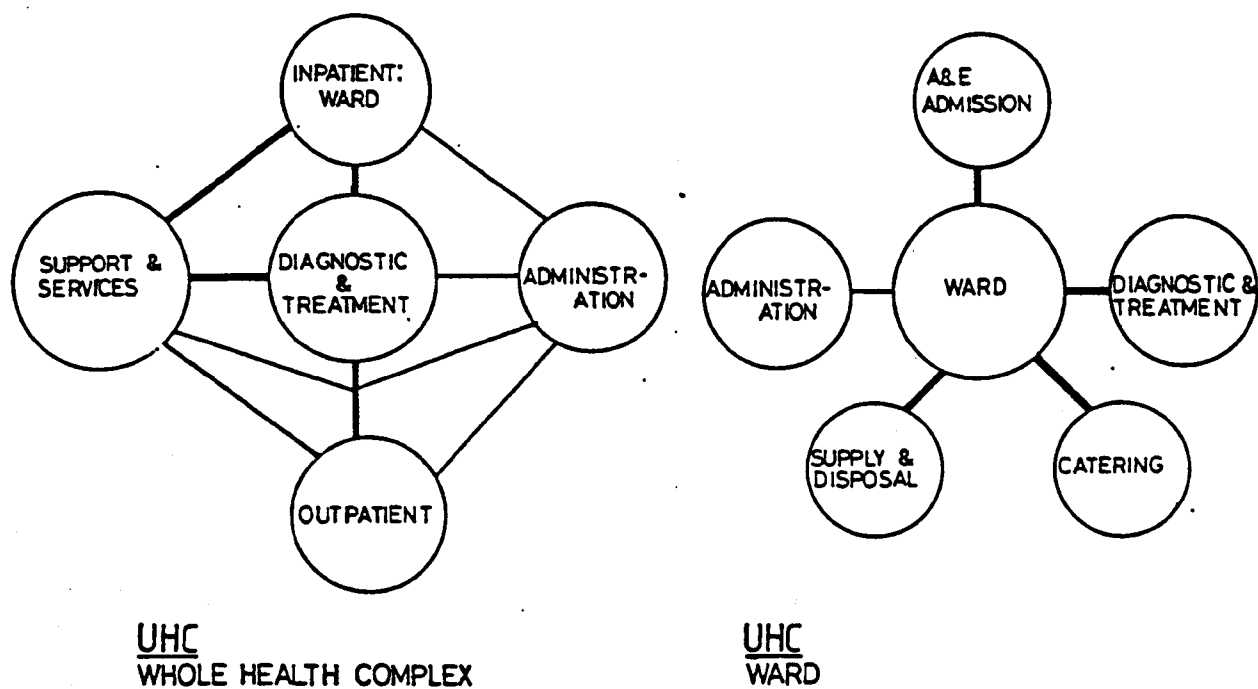
1. patient with escort (out-patient),
2. staff,
3. patients, attendants and visitors (in-patient).

The above analyses reveals that during the design process special care needs to be given to the following design parameters to keep adequate and efficient functional relationships:

- minimum conflict between different traffic flows
- clear and obvious circulation route for each group of users
- strategic positioning of entrances in relation to closely related areas. For example out-patient entrance near registration, exit near dispensary, emergency entrance near treatment, service entrance near receiving store and so on. This will reduce unnecessary movement of people and goods and avoid conflict among groups.
- walking distance e.g. from waiting to the farthest clinic, from nurse's station to farthest patient's bed and so on.

Figures showing activity grouping and inter-relationship: (7.9)

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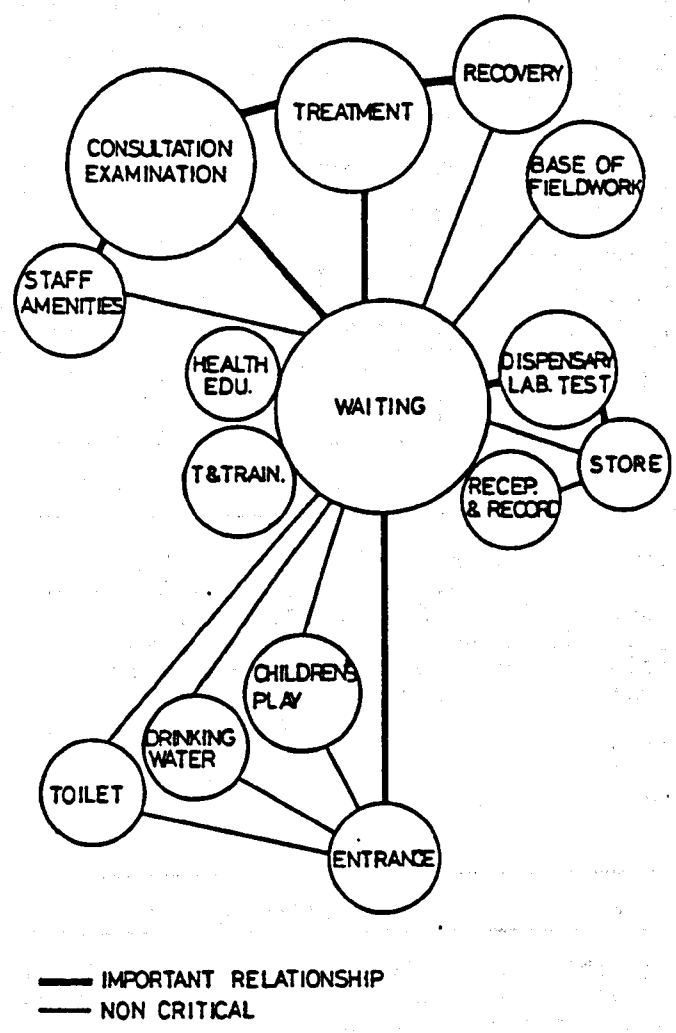
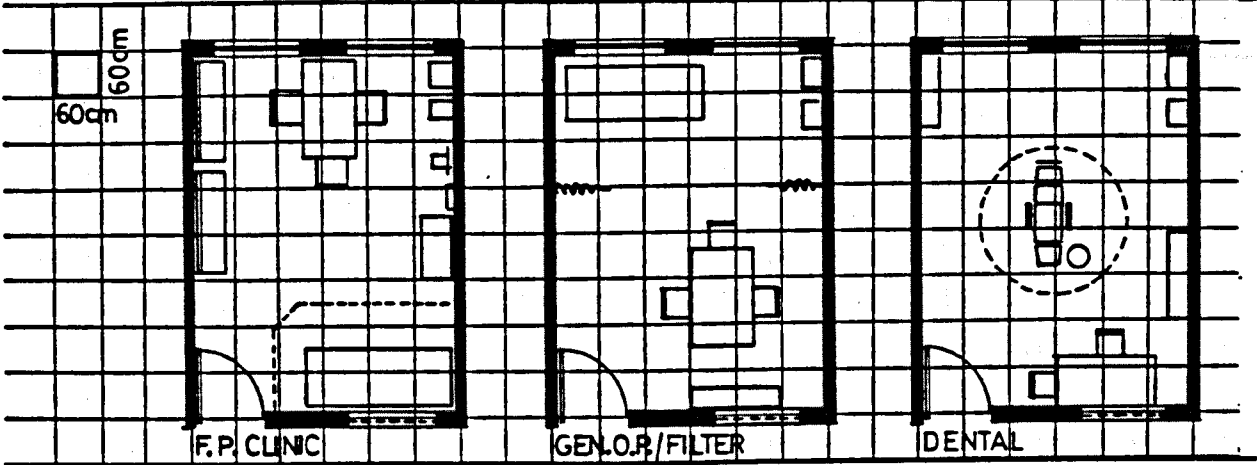


Figure 7.9: Activity grouping and inter-relationship

AIMS AND OBJECTIVES: To provide facilities for consultation, examination and treatment of general, MCH, under five, family planning, dental patients and any other specialty (eg. Leprosy, T.B.).

FUNCTIONS: Consultation, examination (seated, standing or lying); height and weight measurement; writing prescription, request form, referral letter and record keeping.

PARTICIPANTS: Patient with or without escort, clinician (eg. MA, FWV, Doctor, Dentist or any other specialist), doctor's assistant.



Furniture and Equipment Space and size		Environment	Services and Finish
Fixed:		FWV/ MA/Auxili.H. worker's room in light and ventilation.	Artificial light (depending on available electricity supply.)
Table	1	HP, UHFWC and UHC doctors rm.,	Clinical hand washing (type will vary depending on water supply system).
Chair	3/4	Dental surgeon in from outside source.	Easy to clean, smooth surface.
Bench	1		
Exam. couch	1		
Movable:			
Screen/ curtain		Size: 3.6mx4.8m	
Equipment will vary for different clinics eg. ht. and wt. measuring equipment, dental chair and necessities.		centre to centre including wall thickness.	

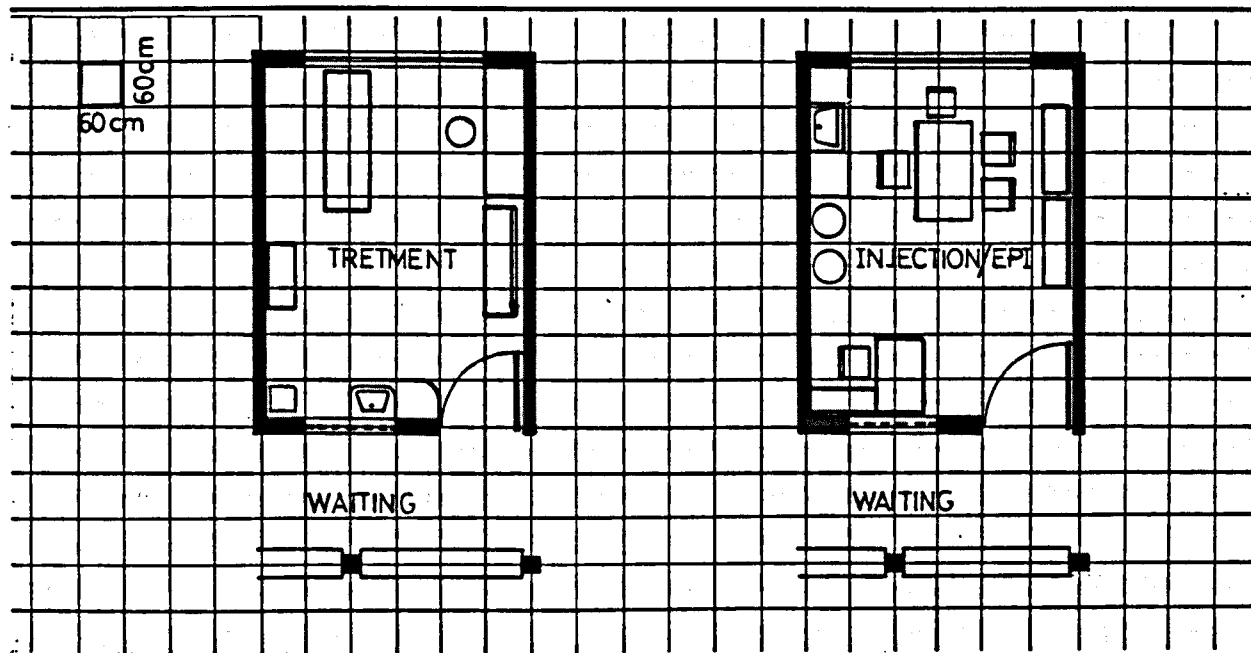
Location and Interspace	Design criteria	Any note
Easy accessibility from waiting area, to dispensary, diagnostic and treatment facilities. (e.g.X-Ray, Laboratory, Injection and immunisation, emergency/treatm., admission office.	High degree of visual privacy during examin. Privacy during consultation and examination. Individual and group treatment.	Consider patient flow and sequence of activities to determine location of individual clinics and their rate of utilisation.

Comments/ Changes from proposed design guidelines:

AIMS AND OBJECTIVES: To provide treatment facilities for general and emergency patients. e.g. injection/ immunisation, dressings, F.P. sterilisation for UHFWC, injection/ immunisation for UHC.

FUNCTIONS: Record keeping, preparation, cleaning, treatment, injection/ immunisation, recovery, equipment sterilisation.

PARTICIPANTS: Patient, escort, FWV/ MA/ MO, assistant, EPI technician.



Furniture and equipment	Space and size	Environment	Service and finish
Treatment couch, trolley, table to keep sterile items, table, chair, bench.	Treatment room/ Injection/ EPI (3.6x4.8)	Natural light and ventilation, visual privacy, sterile environment.	Easy to clean floor and wall surfaces, light, clinical hand wash basin, stove (Kerosine/electric)

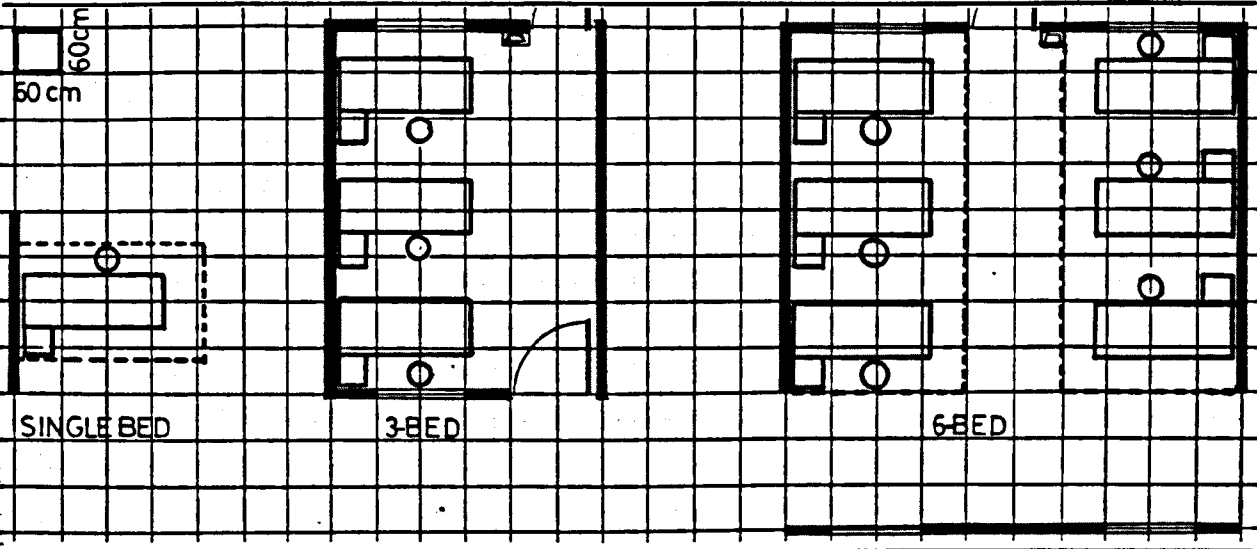
Location and Interspace rel.	Design Criteria	Any note
Direct access from outside, for emergency patients. Accessible to out-patient area, waiting.	Privacy during treatment and recovery. Waiting for emergency, patients and escorts.	Separate staff working and treatment area.

Comments/ changes from proposed design guidelines:

AIMS AND OBJECTIVES: To provide in-patient facilities for 'intensive' and 'intermediate and self care' patients those who need care by nursing and medical staff.

FUNCTIONS: Sleeping, eating, consultation/ examination, treatment, relaxation and recreation.

PARTICIPANTS: Patient, nurse, doctor, attendant/ relative, visitor, ward assistant, laboratory technician, cleaner.



Furniture & Equip. Space and size		Environment	Service	Finish
Fixed:	Bed Centre	Natural light	Light	Easy to clean
Bed 1 to 6	min. 1.6m	and ventilation	(general	floor and
Bedside 1 to 6	max. 2.2m	Low noise level	and night	wall surfaces
locker/table	Bed size:	especially during	time use)	
Stool 1 to 6	1.8mx.7m	sleeping time	Switches	
Movable:	Area per bed	Ability to see	Clinical	
Drip stand	min. 5.9 m2	pleasant outside	hand-washing	
Oxygen Cylinder		view.		
		Homely environm.		

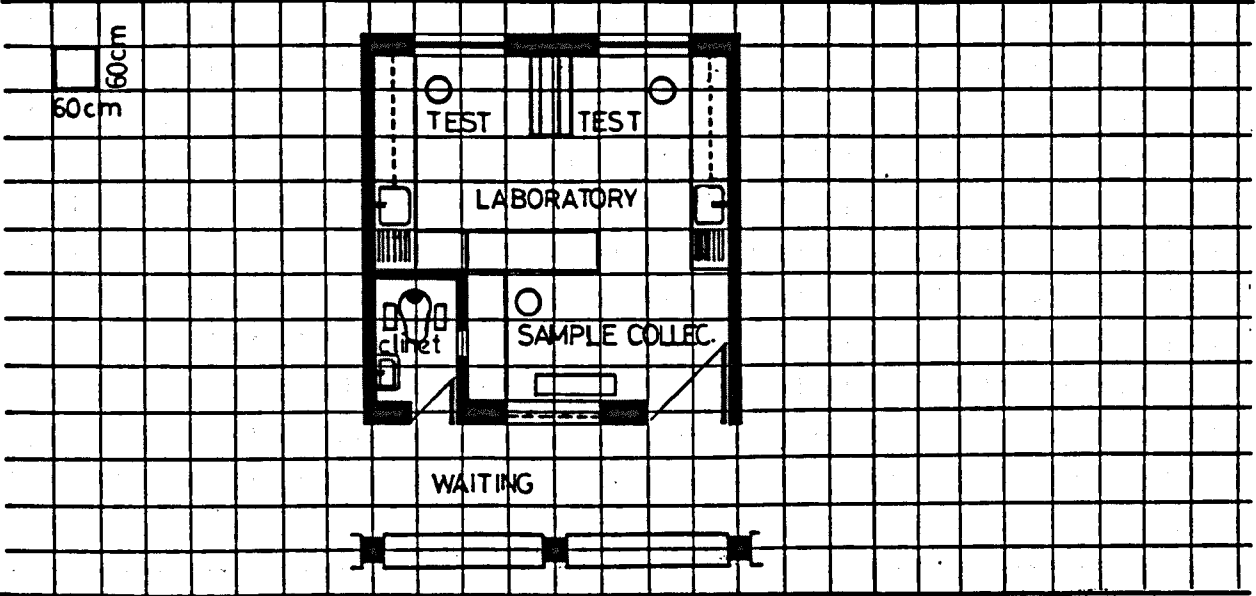
Location and interspace relation.	Design Criteria	Any note
Direct contact with nurse station, easy access to WC, shower, washbasin without disturbing other patients.	Privacy during sleeping, consult. examination/treatment Easy movement of doctor nurse, attendant around bed area.	Patients to be accommodated according to degree of illness, especially with respect to direct visual contact with nurse's station. Possibility for segregating infectitious /communicable disease patients and those needing isolation.

Comments/ Changes from proposed design guidelines:

AIMS AND OBJECTIVES: To provide facilities for routine laboratory tests for outdoor, indoor and emergency patients and sample sent from lower levels and field workers.

FUNCTIONS: Waiting, sample collection, storage, tests, washing, cleaning, desk work, record keeping, test result delivery.

PARTICIPANTS: Laboratory technician, patient, escort, nurse, ward assistant, sweeper, field level workers.

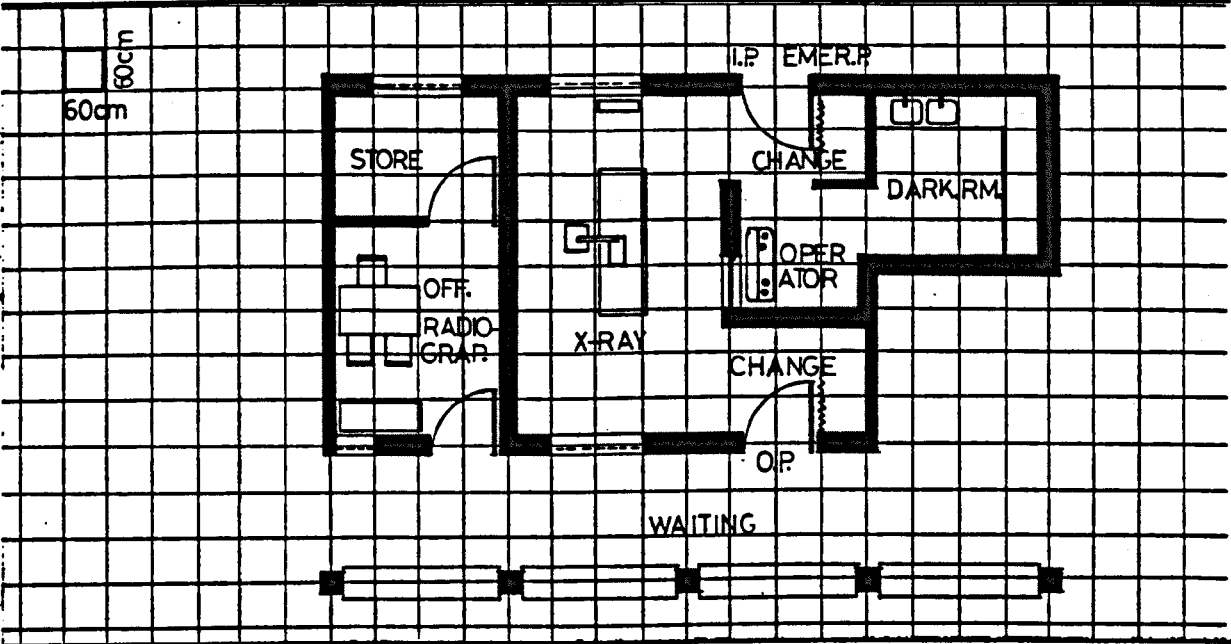


Furniture and equipment	Space and size	Environment	Service and Finish
Table, work-top	Laboratory test,	Natural light	Washing sinks,
Chair	Cleaning	and ventilat.	easy to clean
Bench	Sample collection	Special emphasis	and resistant to
Stool	Waiting	to be given to	chemicals wall,
Rack (for lab. reagent)	Clinnet	test areas, pref.	floor and work-top
Cabinet	Storage	from side for	surfaces.
Burner	Size: 4.8x4.8	easy working	
Micro-scope	including toilet	(direction of	
Chemicals and instrum.		light).	

Location and interspace rel.	Design Criteria	Any Note
Easy access to out-patient, in-patient wards, emergency, operating and delivery areas. Sample collection area should be close to waiting area.	Control of infection, separate clean and dirty test areas.	Protection from infection for staff and patient to be given priority.

Comments/ Changes from proposed design guidelines:

AIMS AND OBJECTIVES: To provide radio-diagnostic facilities for out-patients, in-patients and emergency patients.
FUNCTIONS: Waiting, dress change, X-Ray, processing, delivery and storage.
PARTICIPANTS: Patient, radiographer, escort, nurse, ward assistant.



Furniture and equipment	Space and size	Environment	Service and Finish
X-Ray machine and tube, support, control unit, patient support, chest stand, apron, rack table, chair, worktop and cabinet.	X-Ray Dress Change Operator Dark room Store Radio-grapher's room Waiting	Natural light and ventilation is needed in the X-ray room with adequate protection during operation.	Washing sinks. Radiation proof surfaces and finishes.

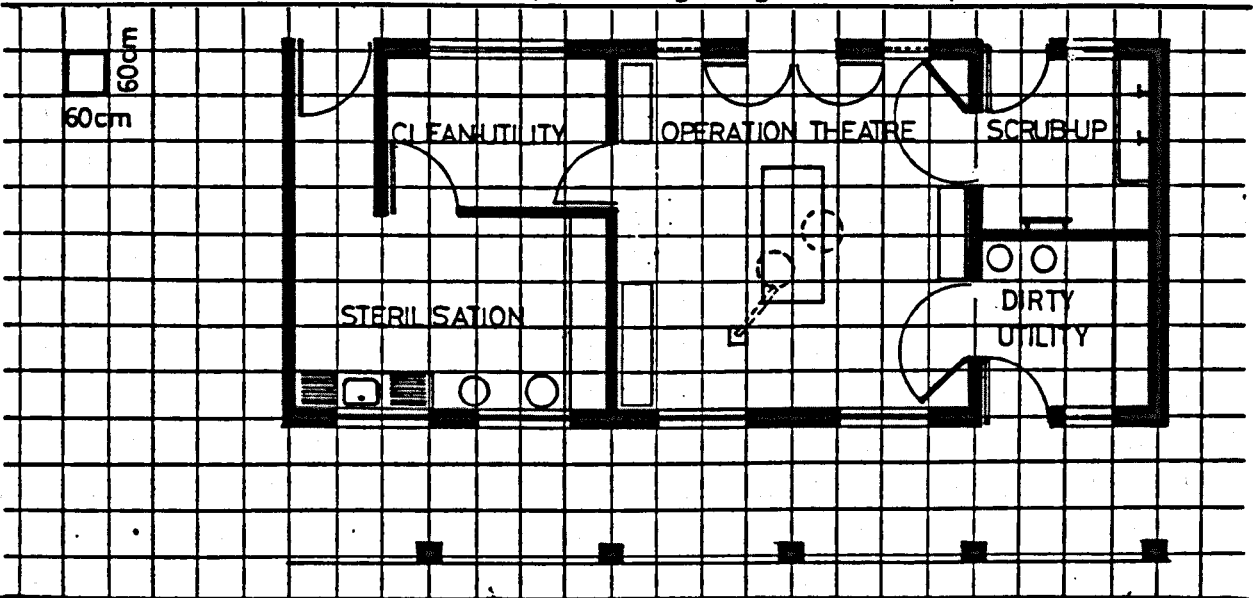
Location and interspace rel.	Design Criteria	Any Note
Accessible to out-patient reception, clinics, waiting, in-patient wards, emergency and operation theatre.	Protection from radiation hazard. Easy movement of trolley/ stretcher around machine.	Generous dimension for radiation protection. Hard area, so location should be such as to need less change.

Comments/ Changes from proposed design guidelines:

AIMS AND OBJECTIVES: To provide facilities for surgical cases of in-patients, emergency patients and for family planning sterilisation using available staff and equipment and considering reduction of cross-infection, easy flow of staff, patient, sterile items and disposal of used items.

FUNCTIONS: Receiving patient, anaesthesia, operation, scrub-up, sterilisation, supply and preparation of surgical instruments before operation, disposal, collection of used items for reprocessing and cleaning.

PARTICIPANTS: Medical officer in charge of operation (e.g. MO-MCH, Emergency MO, UHFPO), MA, FWV, nurse, assistant, visiting surgeon from DH/TH.



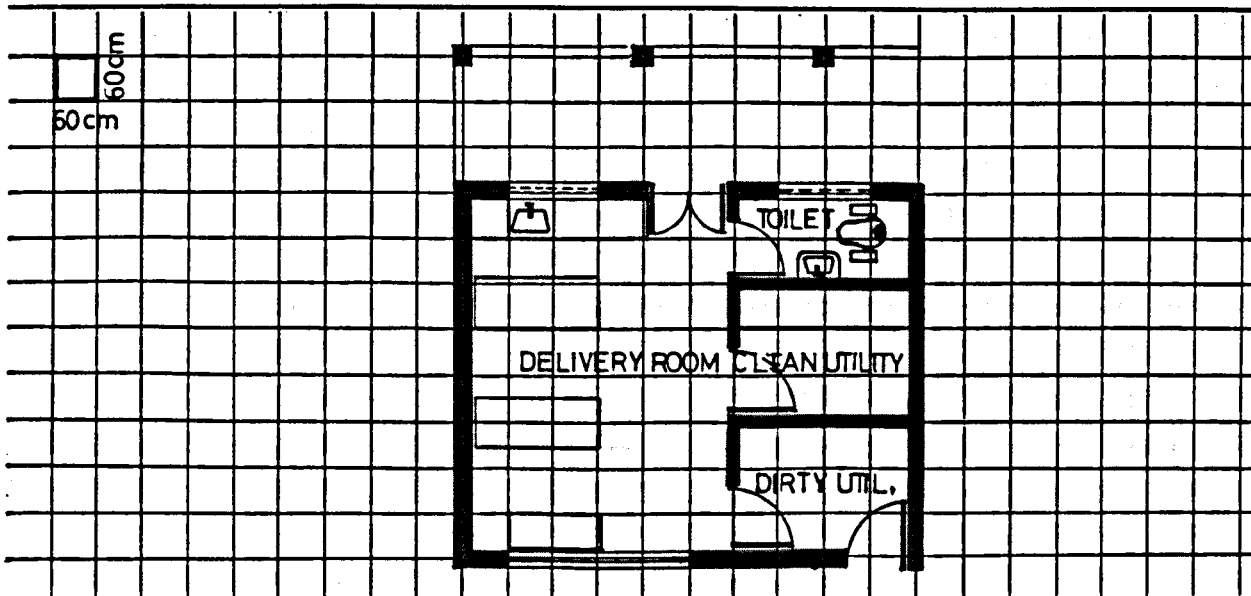
Furniture and equipment	Space and size	Environment	Service and Finish
Operating table, roof mounted/ portable shadowless lamp, trolley, drip stands, disposal bins.	Operating theatre (4.8x4.8), Sterilising area, Dirty utility, Clean utility. Scrub-up	Control of infection, comfortable working condition.	Easy to clean walls and floor surfaces, drainage of washed water, avoid recess and projections, round corner, floors should have proper drainage slope.
Location and interspace rel.	Design criteria	Any note	
Near surgical ward, emergency, X-Ray, Laboratory. Direct access to scrub-up, dirty and clean utility, sterilisation and recovery area.	Zoning of spaces for easy flow of patient, staff and supply and to maintain sterility. Supply and disposal should have separate access	Infection control should be given priority.	

Comments/ changes from proposed design guidelines:

AIMS AND OBJECTIVES: To provide facilities to secure safe delivery of maternity cases.

FUNCTIONS: Observation, consultation, examination, normal delivery and referral of complicated cases needing ceasarian section to DH/ TH.

PARTICIPANTS: MO-MCH, FWV, nurse/ midwife, TBA, aya, patient, attendants/ relatives, trainees.



Furniture and equipment	Space and size	Environment	Service and Finish
Delivery bed, work-top, trolleys, shelves.	Delivery room (3.6x4.8), Dirty utility, Clean utility area, toilet, Sluice.	Natural light and ventilation, strict privacy from outside, sound proof wall.	Hand wash basin Easy to clean walls and floor surfaces, drainage of washed water with proper floor slope.

Location and interspace rel.	Design criteria	Any note
Maternity wards (A.N. and P.N.) female ward, central sterilisation area, emergency, easy access to sluice / dirty and clean utility, toilet.	Special cleanliness of delivery area, infection control, easy movement of patient and staff.	Clear work space around delivery bed. Privacy of patient, traditional practice to be maintained.

Comments/ changes from proposed design guidelines:

7.2.4.2 Exemplar Activity Clusters (see Fig 7.13)

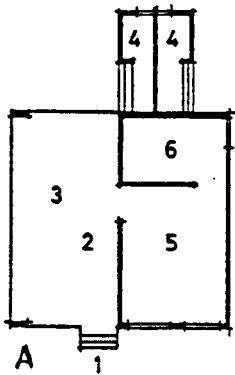
Legend:

HP:

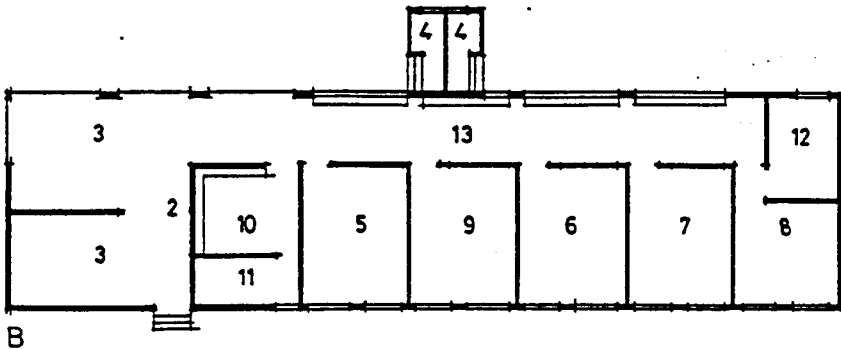
1.Main entrance, 2.Reception, registration, 3.Main waiting combined with health education, 4.Toilet (Male and Female), 5.C/E General out-patient, MCH, F.P., Under-five (Auxiliary health worker), 6.Store

UHFWC:

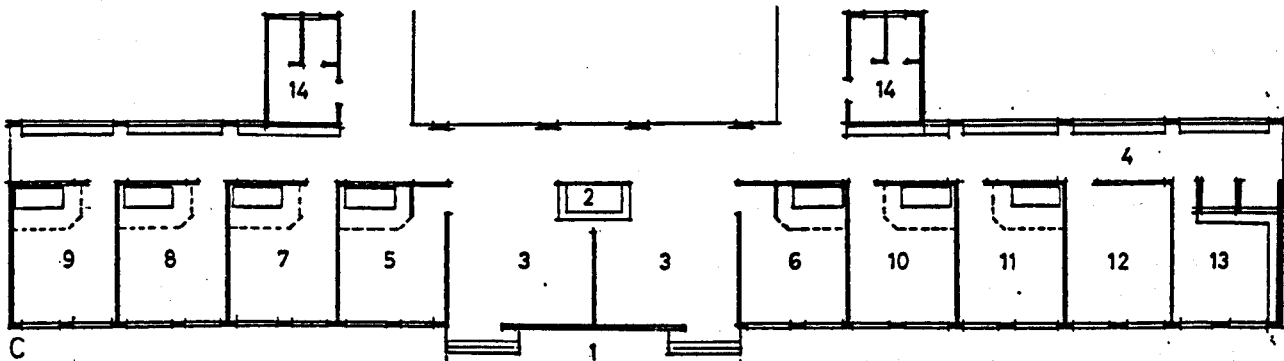
1.Main entrance, 2.Reception, registration, 3.Main waiting combined with health education teaching and training, 4.Toilet (Male and Female), 5.C/E General out-patient (MA) 6. MCH, F.P., Under 5 (FWV), 7. Treatment, Immunisation and Sterilization (including equipment sterilisation), 8.Recovery (2-bed), 9.Field workers office/visiting doctors clinic 10.Dispensary and Laboratory test, 11.Store, 12.Kitchenette, 13. Sub-wait, Children play (outside), Drinking water (outside)



PLAN
OUTPATIENT AREA (HP)
SCALE 0 1 2 4M



PLAN
OUTPATIENT AREA (UHFWC)
SCALE 0 1 2 4M

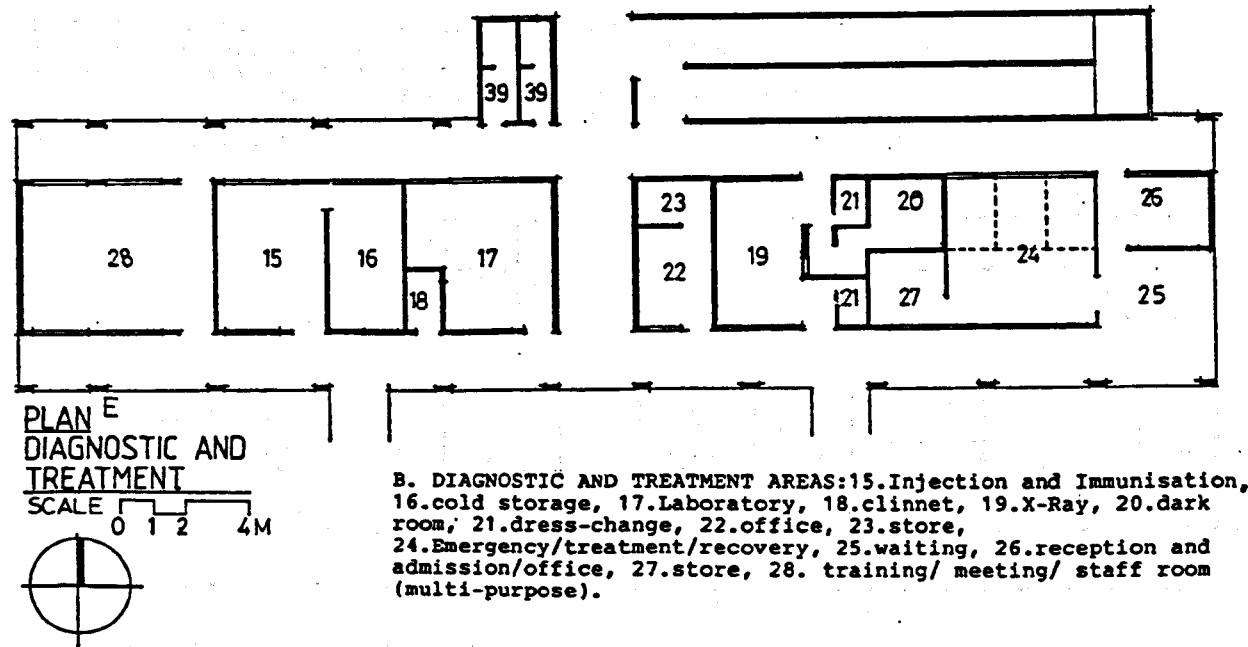
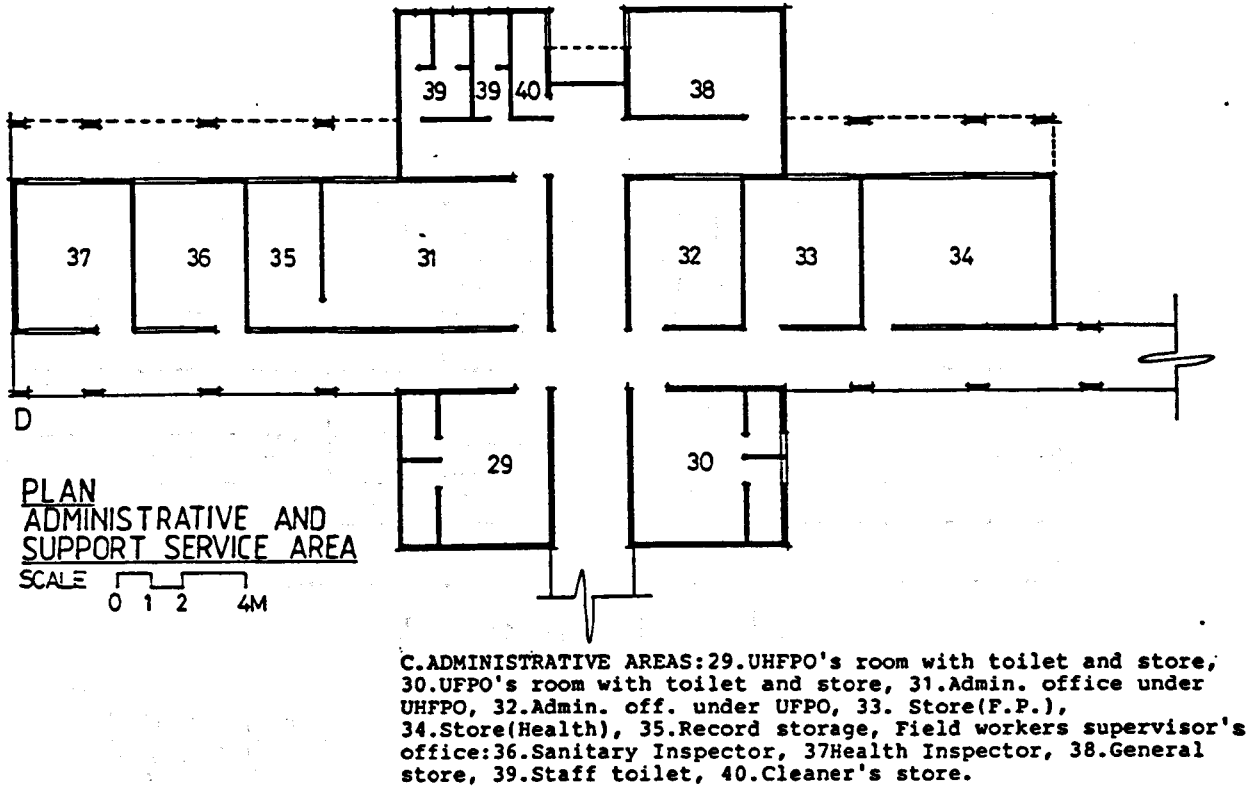


PLAN
OUTPATIENT AREA (UHC)
SCALE 0 1 2 4M

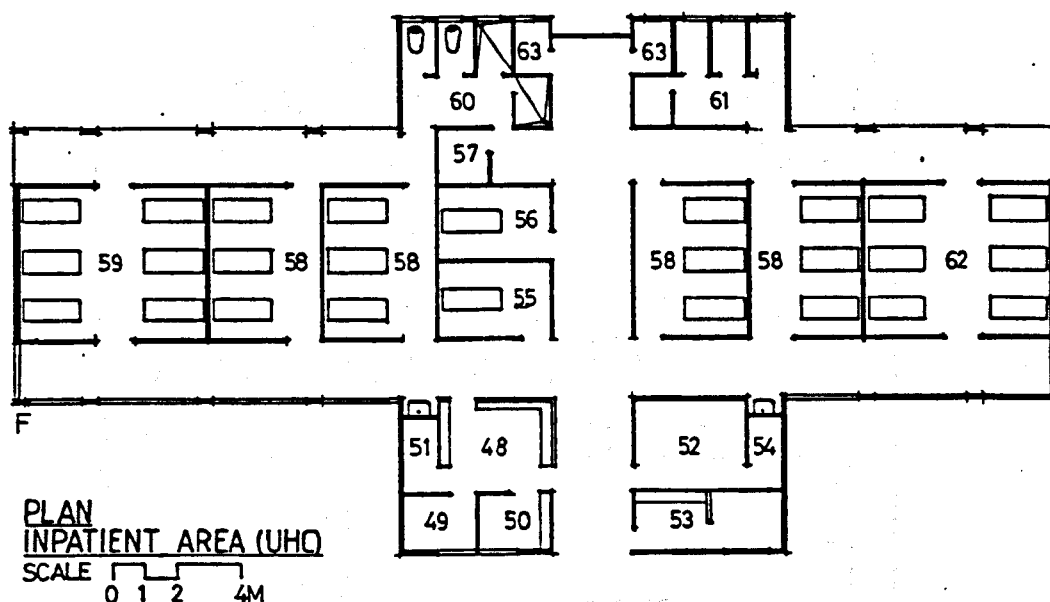
UHC:

A.OUT-PATIENT AREA:1.Main out-patient entrance, 2.Reception, registration, 3.Main waiting (screened male-female separation) combined with health education, class, 4.Sub-waiting (near individual clinics), Filter clinic: 5.FWV, 6.MA, O.P. Clinics: 7.MO-MCH, 8.MO (gynae.), 9.F.P. clinic/treatment, 10.MO (medicine), 11.MO (surgery), 12.MO (dental), 13.Dispensary 14.Sanitary facilities (male, female)

7.2.4.2 Exemplar Activity Clusters (see Fig 7.13)

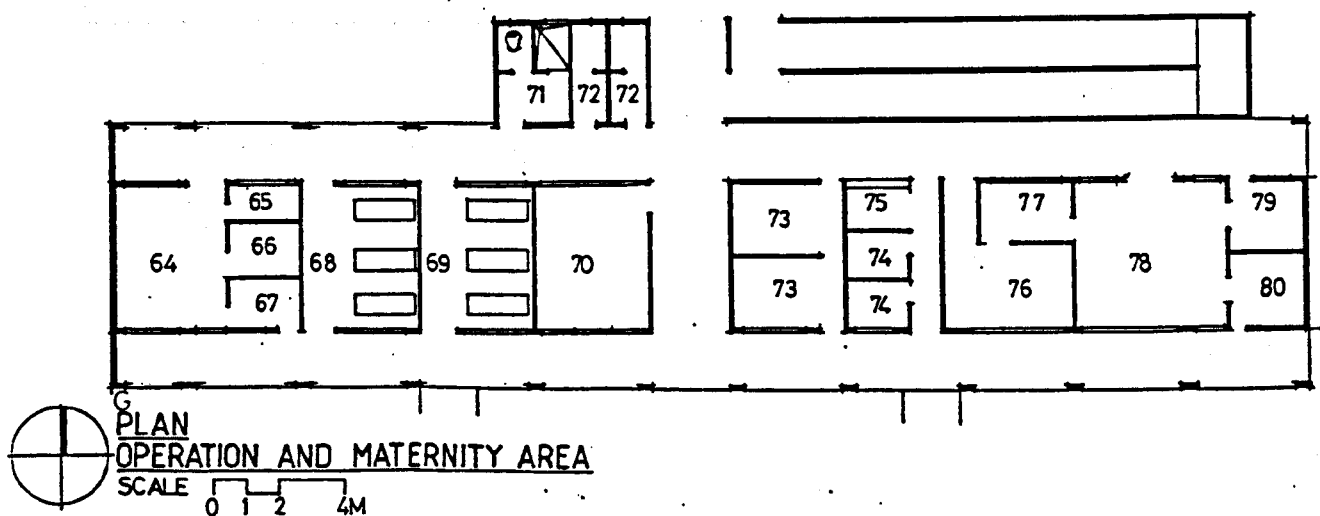


7.2.4.2 Exemplar Activity Clusters (see Fig 7.13)

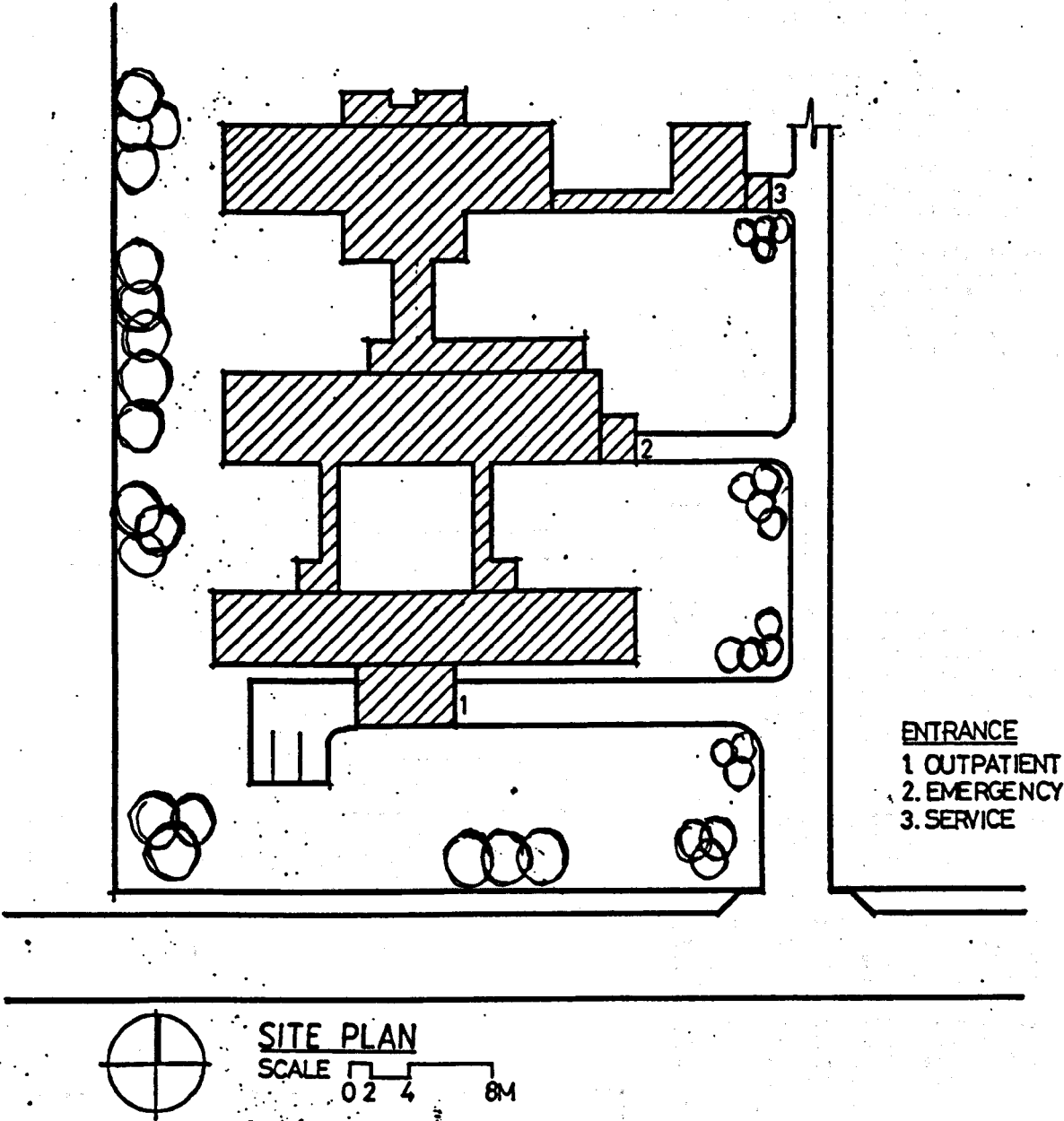


E. IN-PATIENT AREA: 48. Nurse's station, 49. Clean utility, 50. Store, 51. Toilet, 52. Doctor's room 53. Pantry and dining, 54. Toilet, 55. Isolation, 56. Treatment, 57. Dirty utility, 58. 3-bed bay, 59. 6-bed bay (female), 60. female toilet, 61. male toilet 62. 6-bed bay (male), 63. toilet (relative/attendant)

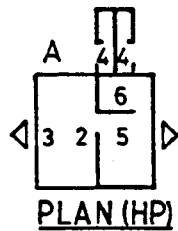
F. OPERATING AND DELIVERY: 64. Delivery, 65. Toilet, 66. Scrub-up, 67. Store, 68. Antenatal, 69. Post-natal 70. Nurse's room, 71. Patient's toilet, 72. Staff toilet, 73. Recovery, 74. dress-change-2, 75. Reception, 76. Sterilisation, central 77. Clean utility, 78. Operation Theatre, 79. Scrub-up, 80. Dirty utility, 81. Visitors waiting.



7.2.4.3 Exemplar Individual Facility Layout (see Fig. 7.14)



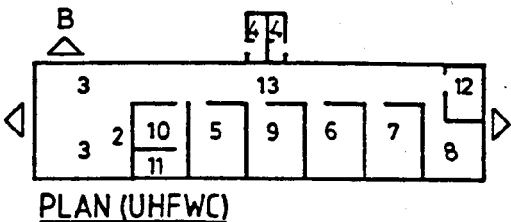
7.2.4.3 Exemplar Individual Facility Layout (see Fig. 7.14)



Legend:

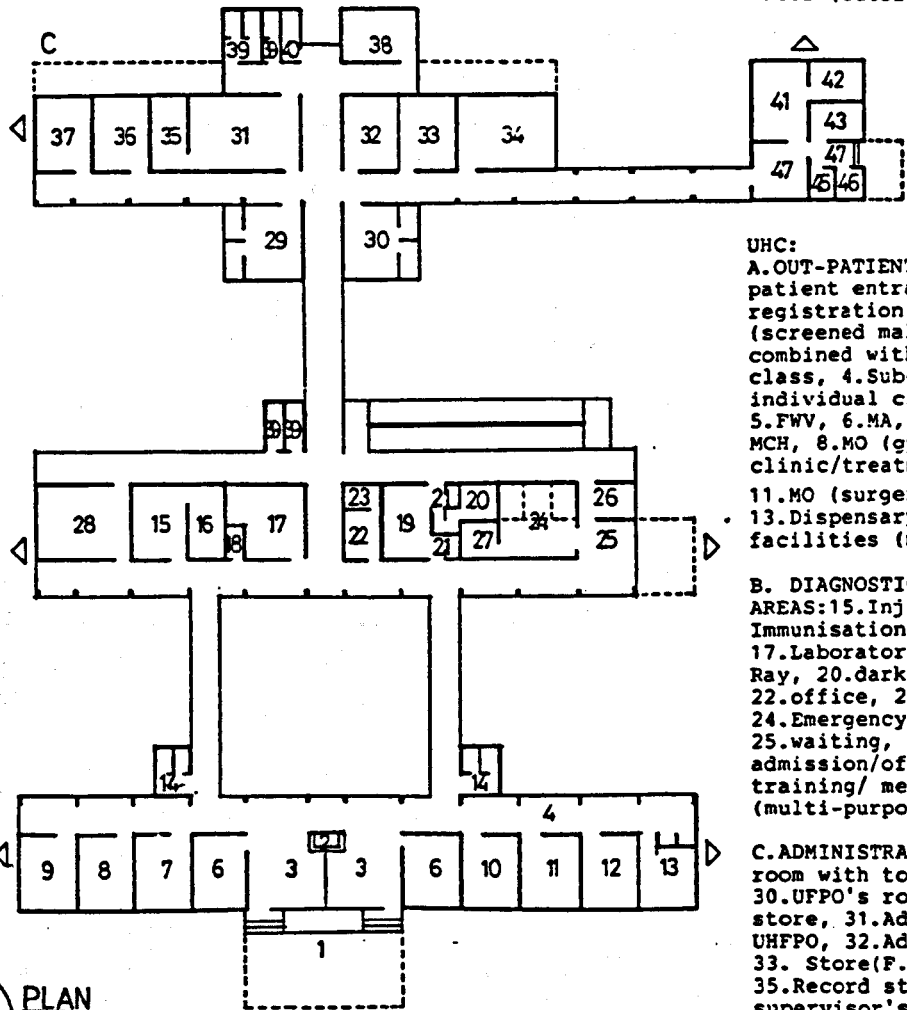
HP:

1.Main entrance, 2.Reception, registration, 3.Main waiting combined with health education, 4.Toilet (Male and Female), 5.C/E General out-patient, MCH, F.P., Under-five (Auxiliary health worker), 6.Store



UHFWC:

1.Main entrance, 2.Reception, registration, 3.Main waiting combined with health education teaching and training, 4.Toilet (Male and Female), 5.C/E General out-patient (MA) 6. MCH, F.P., Under 5 (FWV), 7. Treatment, Immunisation and Sterilization (including equipment sterilisation), 8.Recovery (2-bed), 9.Field workers office/visiting doctors clinic 10.Dispensary and Laboratory test, 11.Store, 12.Kitchenette, 13. Sub-wait, Children play (outside), Drinking water (outside)



UHC:

A. OUT-PATIENT AREA: 1. Main out-patient entrance, 2. Reception, registration, 3. Main waiting (screened male-female separation) combined with health education, class, 4. Sub-waiting (near individual clinics), Filter clinic: 5. FWV, 6. MA, O.P. Clinics: 7. MO-MCH, 8. MO (gynae.), 9. F.P. clinic/treatment, 10. MO (medicine), 11. MO (surgery), 12. MO (dental), 13. Dispensary 14. Sanitary facilities (male, female)

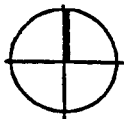
B. DIAGNOSTIC AND TREATMENT

AREAS: 15. Injection and Immunisation, 16. cold storage, 17. Laboratory, 18. clinnet, 19. X-Ray, 20. dark room, 21. dress-change, 22. office, 23. store, 24. Emergency/treatment/recovery, 25. waiting, 26. reception and admission/office, 27. store, 28. training/ meeting/ staff room (multi-purpose).

C. ADMINISTRATIVE AREAS: 29. UHFPO's

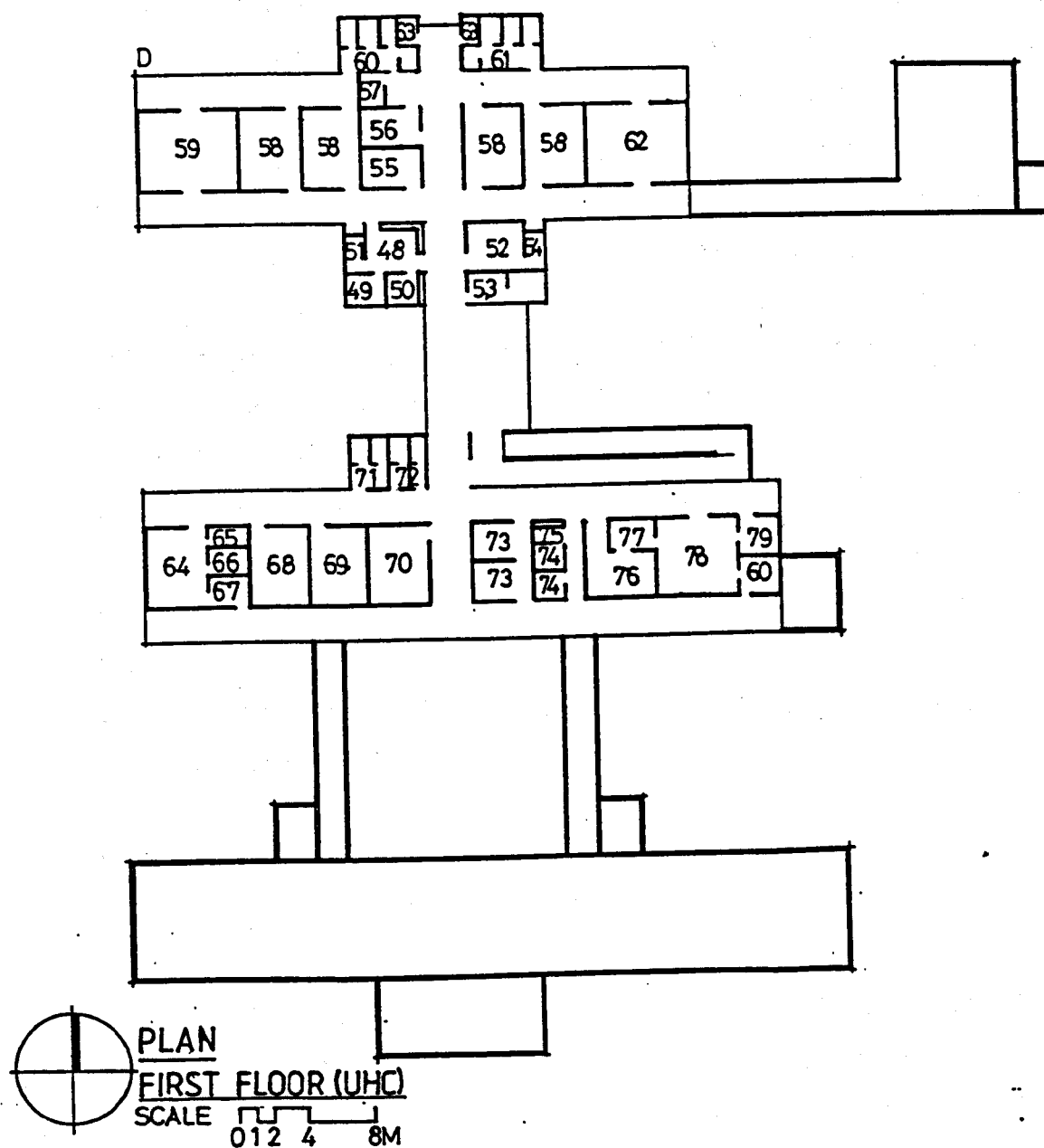
room with toilet and store, 30. UFPO's room with toilet and store, 31. Admin. office under UHFPO, 32. Admin. off. under UFPO, 33. Store (F.P.), 34. Store (Health), 35. Record storage, Field workers supervisor's office: 36. Sanitary Inspector, 37. Health Inspector, 38. General store, 39. Staff toilet, 40. Cleaner's store.

D. CATERING: 41. Kitchen, 42. Store, 43. Bulk storage of fire wood, 44. Verandah, 45. Toilet, 46. Washing area 47. Receiving/ distribution area



PLAN GROUND FLOOR (UHC)
SCALE 0 1 2 4 8M

7.2.4.3 Exemplar Individual Facility Layout (see Fig. 7.14)



Conclusion

After independence, different health policies and programmes were directed towards achieving "Health for All" emphasising Primary Health Care. But contrary to the expectations many of these programmes for services and facilities proved inadequate in terms of meeting the needs of individuals and communities to be served. Factors like under utilisation of the existing facilities, by-passing phenomena, lack of resources, services and so on are recognised. Since a substantial portion of the country's scarce resources in the health sector are directed towards the development of PHC, any costly mistakes due to lack of appropriate planning and design should be avoided. In addition to these, lack of appropriate guidance for planning and designing PHC facilities caused confusion and chaos. Although a large number of facilities are built and functioning, no attempt has been taken to formulate guidelines for future development work which is substantial to achieve the goal and coverage. No fruitful evaluations are made to identify problems, changes in needs and requirements, successes and failures before applying the type designs throughout the country. It is in this situation the study has been undertaken to fill up this gap and develop a systematic method of planning and designing PHC facilities under the strategies and constraints of Bangladesh.

The study attempts to develop a method and express those in the form of a guidance for health facility planners and designers.

Planning and programming for health facilities should stem from the real and felt need and requirements of the community. Thus the background of the country as well as the community to be served, health situation and health service strategy, planning and design of health buildings need all be given due consideration. Planners and designers should be aware of the constraints imposed by limited money, manpower and building resources, climate, available technology, local and cultural traits and so on. Demographic and epidemiological profiles of Bangladesh reveal that the major causes of poor health are due to the high population growth rate, many communicable and infectious diseases and socio-economic conditions affecting mostly mothers and children- the most vulnerable group of the rural society. Health care should comprise promotive, preventive, curative and rehabilitative services appropriate to individual's health need with proper levels of

services. Problems identified from the existing situations help to set priorities and to solve those which are most vital and feasible within the country's resource limitations.

A review and analysis of published guidance and method of planning and design from different developing and developed countries revealed the essential stages of work and format of guidance and were found to be similar in principle. For example the need to identify the stages of work from inception to completion, the stage specific tasks and the links between different stages were identified to be essential for developing guidance. The study resulted in the development of a theoretical model delineating all the essential stages of planning and designing health care facilities. A step by step approach is followed in the structure of the guidance where aims and objectives, methods and related considerations are outlined. This approach is found useful to focus the study within the subject area, prepare the ground work and a check list to conduct field investigation. A sound methodology is identified for conducting the survey work stating objectives, methodology, sample selection procedure and questionnaire design. A representative sample is selected considering nation-wide distribution, variation in design, catchment area and population. The aim was to produce a generalised picture which is useful for preparing guidance.

Survey and analyses of functioning UHCs and UHFWCs identified need and problem areas. The problem areas encompass lack of co-ordination and clear definition of roles, responsibilities, services and functions of individual units and manpower; inadequate manpower, supplies, equipment, facilities and services to meet user's needs; inappropriate referral system, supervision and management; inappropriate location, distribution and siting of facilities; inappropriate space organisation and functional relationship between closely related activity spaces; lack of proper growth plan and inability of layout to respond to changes in function; problems related to privacy, security and sex segregation; lack of any organised maintenance policy and so on. The successes and achievements are also highlighted in the survey analyses.

The problem and need identification phase through physical and functional evaluation of existing facilities helped to make planning decisions on roles, services, functions, location, distribution and outline project brief of individual facilities.

The design concept recognised the advantages and disadvantages of various approaches to design e.g. complete and departmental type designs, activity and room data based design to individual/one- off buildings. It also recognised the fact that the guidance will be more practical if it can be used under different circumstances -construction on a new site, extension of an existing unit and up gradation. As well the need for flexible design which can grow and change with available resources and changing need and demand was paramount. Based on all the planning and design strategies it was decided to design an unit which can grow and change to a higher level or in between stages in a phased manner. The guidance covers common activity components(e.g. C/E rooms, bed- bays, Treatment..), which dominate and also determine the size and shape of individual units, and subsequently activity clusters(O.P. area, In-patient area, Diagnostic and Treatment...). An exemplar plan at each level of PHC facilities, with the design based on the proposed guidance, shows the potential for growth and change at individual level and also where the smaller unit can grow to higher unit in successive phases.

Note: During the study period, the Government has replaced the Upazilla system with Thana administrative system. This change, however, has not affected the existing health structure and services. The UHCs were also functioning under the same name. Thus in order to keep consistency the name 'Upazilla' is used throughout the thesis.

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- A-1 Background information and country data**
- A-2 Questionnaire**
- A-3.1 Variation in Catchment Area and Population**
- A-3.2 Variation in number of facilities and terminology used**
- A-4 Sanitary facilities**
- A-5 Workload Calculation**

A-1 Background information and country data

A 1.0 GENERAL BACKGROUND

1.1 GEOGRAPHY (Location, topography, climate, transportation and communication)

Location :

Bangladesh is situated in the region of south-east Asia , between 22.75° and 25.75° in north latitude and 92.75° in east longitudes.¹ It is bordered on the west, north and north east by India, the south-east by Burma and south by the Bay of Bengal. Dhaka, the capital city, is situated approximately at the centre of the country. (see Fig. 1)

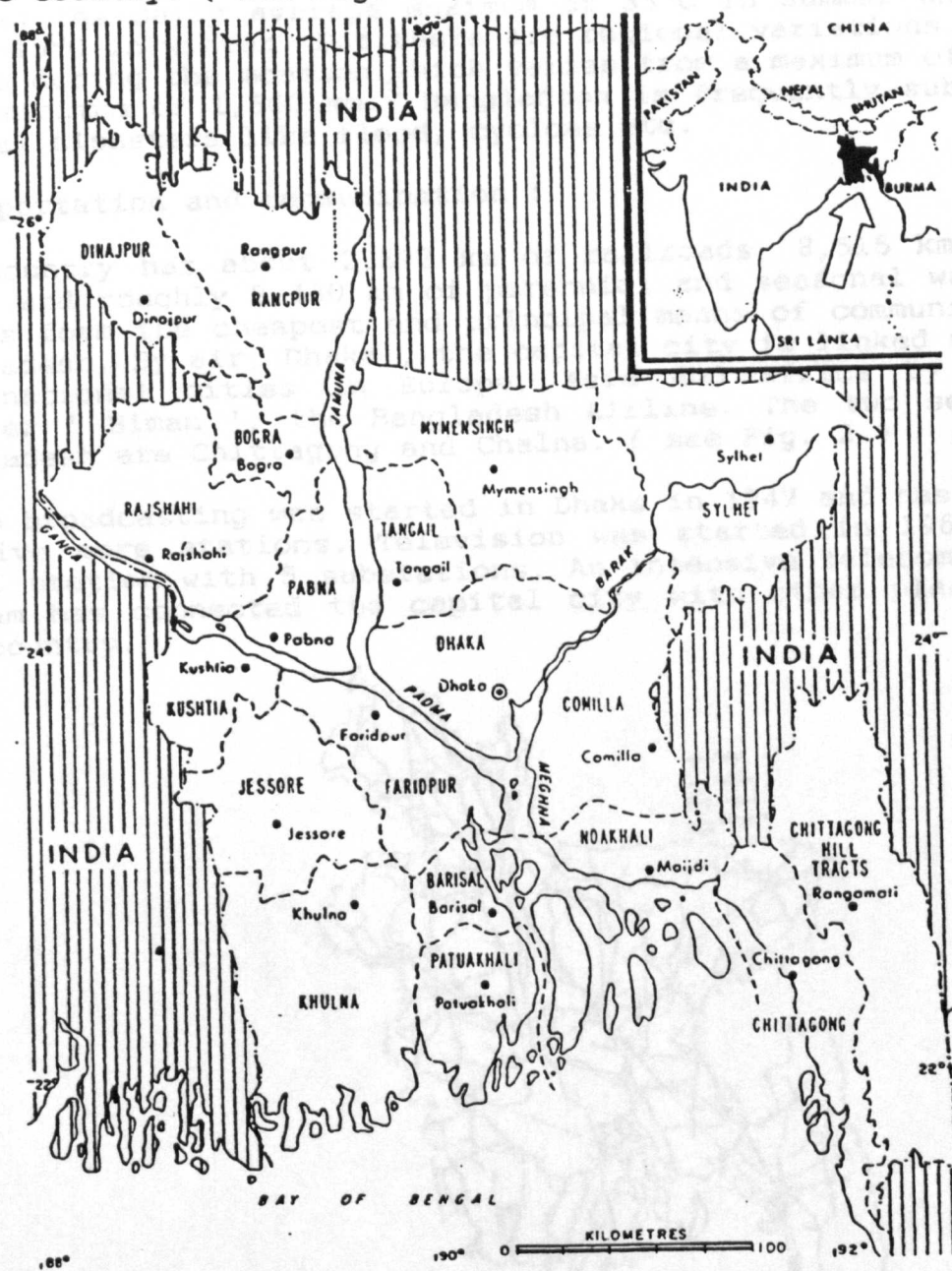


Figure : 1
Location of Bangladesh
Source : ibid 1

International boundary
Divisional boundary
Capital District

Topography :

Bangladesh is about 55,598 square miles (1,44,300 square km) in area . It is basically a riverine country with low, flat deltaic terrain. About 230 rivers with an approximate length of 15,000 miles criss cross the country and flow down to the Bay of Bengal. The eastern part of Bangladesh is formed by the Chittagong Hill Tracts which rises 610 to 915 metre above sea level.² Approximately 14% of total land is covered by forest.

Climate :

Bangladesh has a subtropical monsoon climate with hot and humid summers and cool, dry winters. The range of temperature is between the daily average maximum of 35°C in summer and minimum of 10-15°C in winter. But there are regional variations. Rainfall occurs during the monsoon which varies from a maximum of 4,700 mm to a minimum of 1,500 mm.³ Bangladesh is frequently subjected to natural disasters like flood, cyclone etc.

Transportation and communication :

The country has about 2,892 km of railroads, 8,516 km of paved roads and roughly 8,430 km of perennial and seasonal waterways.⁴ Rivers form the cheapest and principal means of communication in Bangladesh. By air, Dhaka , the capital city is linked with major international cities in Europe, Asia and Africa by its flag carrier ' Biman ', the Bangladesh Airline. The two seaports of Bangladesh are Chittagong and Chalna. (see Fig. 2)

Radio broadcasting was started in Dhaka in 1947 and has increased to five more stations. Television was started in 1964 and now has 1 station with 5 substations. An intensive telecommunication system has connected the capital city with other places within the country.

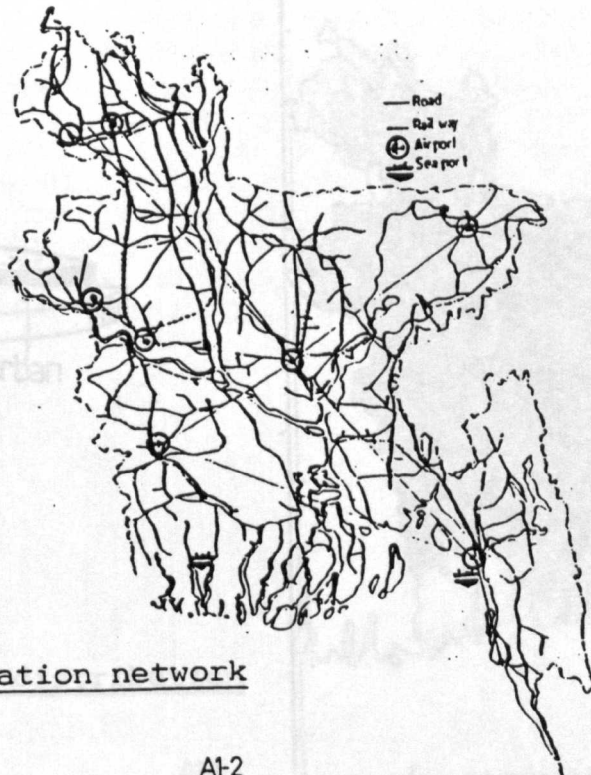


FIG. 2
Map showing communication network
Source :

1.2 POPULATION : 5

Bangladesh is the seventh largest nation in the world. According to the 1987 estimate, the population of Bangladesh was 107.1 million with an annual growth rate of 2.7% and density of 742.2 persons per square kilometre. The density of population was 631 persons per square kilometre in 1981 and is expected to be 1396.3 persons per square kilometre by the year 2000. Projected population for the year 2000 and 2020 are 144.9 and 201.5 million respectively which shows a high population growth rate.(see Fig 3 and 4)

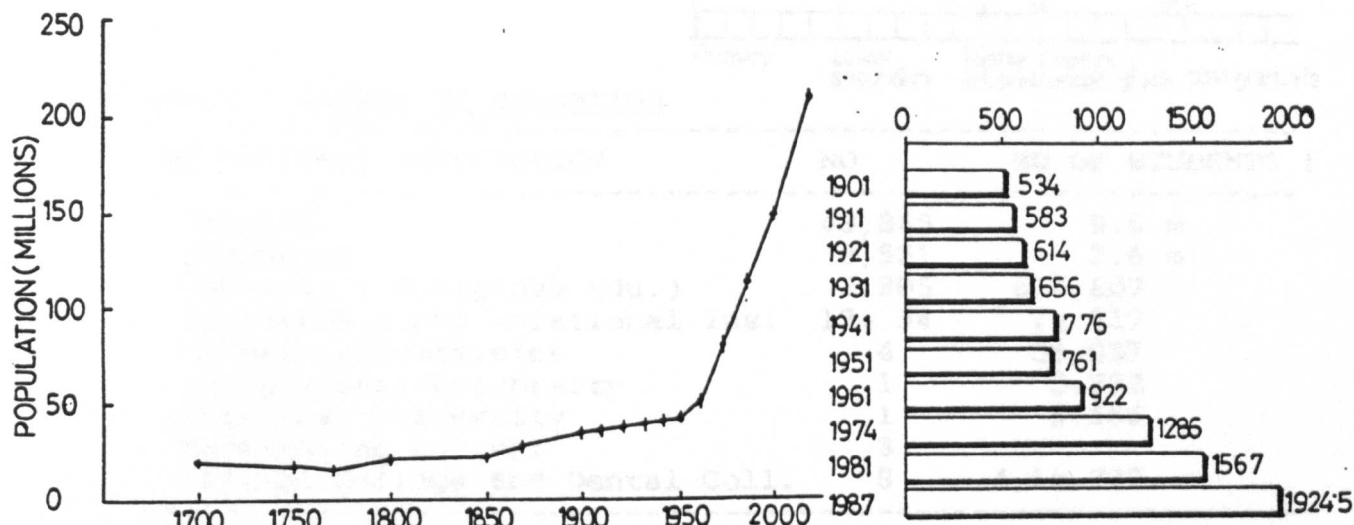


Figure 3: Growth of population Figure 4: Density of population

The distribution of population in urban and rural areas is very uneven. In 1981 around 15 % of the 90 million people lived in urban areas. In 1987 however it had reduced to 13 %. (Fig 5)

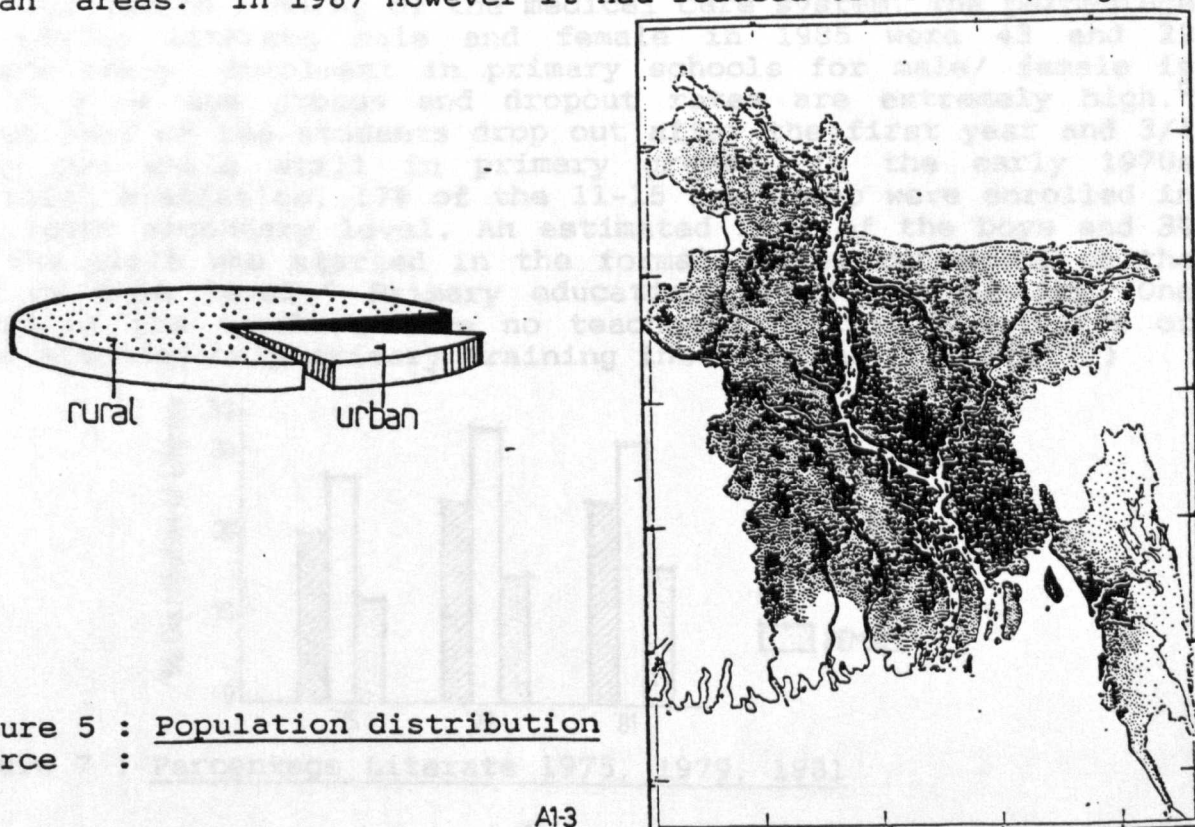


Figure 5 : Population distribution
Source :

Education :

In Bangladesh , academic training consists of three levels before the university or equivalent degree college. Five years of primary school leads to five years of lower secondary followed by two years of higher secondary level. After completion of the lower secondary level one has to sit for the Secondary School Certificate Examination and afterwards the Higher Secondary Certificate Examination. Education is not compulsory and partly Government funded. (see Fig. 6 and Table 1)

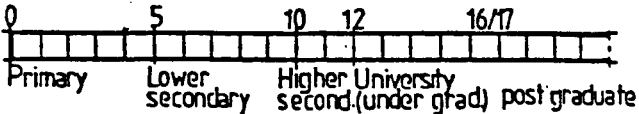


Figure 6 : Levels of education

EDUCATIONAL INSTITUTION	NO	NO OF STUDENTS !
Primary	43,865	9.6 m
Secondary	8,551	2.6 m
Madrasas (Religious Edu.)	2,805	618,607
Polytechnic and vocational Ins.	17+ 54	16,317
General Universities	4	38,037
Agricultural University	1	3,782
Technical University	1	5,166
Engineering College	3	
Medical College and Dental Coll.	8	4,16,777

Table : 1 Source : Statistical Year Book of Bangladesh 86

Literacy :

Literacy is the basis of communication which ensures the optimal use and smooth running of the medical care system. The percentage of adults literate male and female in 1985 were 43 and 22 respectively. Enrolment in primary schools for male/ female is 70/50 % of age groups and dropout rates are extremely high.⁶ About half of the students drop out after the first year and 3/4 drop out while still in primary grades. In the early 1970s official statistics, 17% of the 11-15 age group were enrolled in the lower secondary level. An estimated 10 % of the boys and 3% of the girls who started in the formal system continued to the end of this level.⁷ Primary education is of low quality. One third of the teachers have no teacher training. Two thirds of them attended only primary training institutions. (Fig 7)

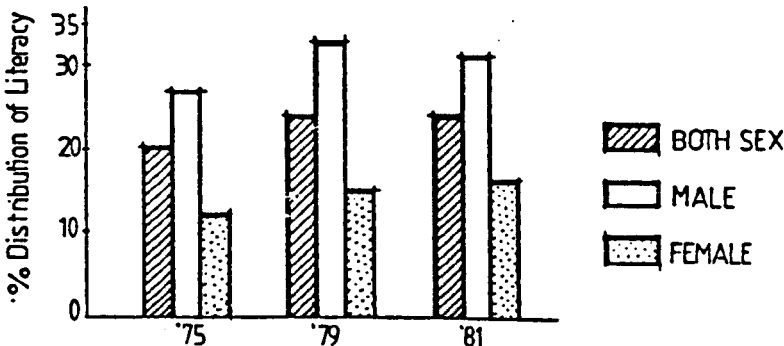


Figure 7 : Percentage Literate 1975, 1979, 1981

1.3. ECONOMY AND RESOURCES ⁸

Bangladesh is one of the 'least developed countries' in the world. In 1980 about 80 % of the population lived below the poverty line and about 33 % of the labour force faced unemployment. The per capita GNP of Bangladesh in 1975 and 1985 was US \$ 90 and 130 respectively. In 1987 it was increased to US \$ 150. The Government allocation of budget in 1984-85 in the health sector was only 3.47 %. (see Fig. 8) Industry is a relatively small sector in Bangladesh and contributes less than 10 % to the GDP.

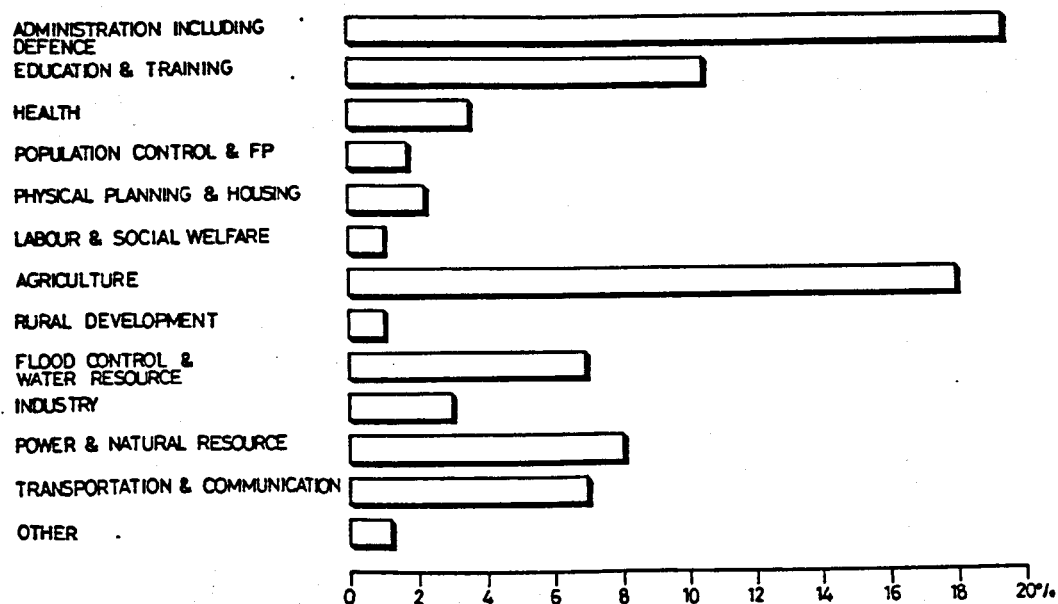


Fig.8 Government allocation of budget in 1984-85 (in percentage)
Source: Statistical Year Book of Bangladesh 86

Agricultural resources :

The predominant economic resource of Bangladesh is agriculture. It contributes around 49% to the Gross Domestic Product (GDP) engaging nearly 62 % of the total labour force. Rice, jute, sugarcane, tobacco, oil seeds, potatoes etc. are the principal crops. Among these rice is the dominant crop and grown throughout the year. About 75 % of the export earnings come from jute and jute products. A good quantity of tea is also exported.

Mineral and energy resources :

Natural gas which is abundantly available is used as industrial fuel, to run power stations, as raw material for fertiliser production and also for limited household consumption. Limestone in limited quantities is used as raw material for cement. More lime and coal deposits have been discovered. Forestry contributes another major resource.

Industrial resources :

Although Bangladesh is predominantly an agrarian country, a number of large scale industries have been set up based on both indigenous and imported materials. Among them jute, cotton, textiles, paper and news print, sugar, cement, chemicals, fertilisers and tanneries are important. The industrial sector contributing around 10 % of the GDP is dominated by jute processing followed by cotton, textiles and cigarettes. (see Fig. 9)

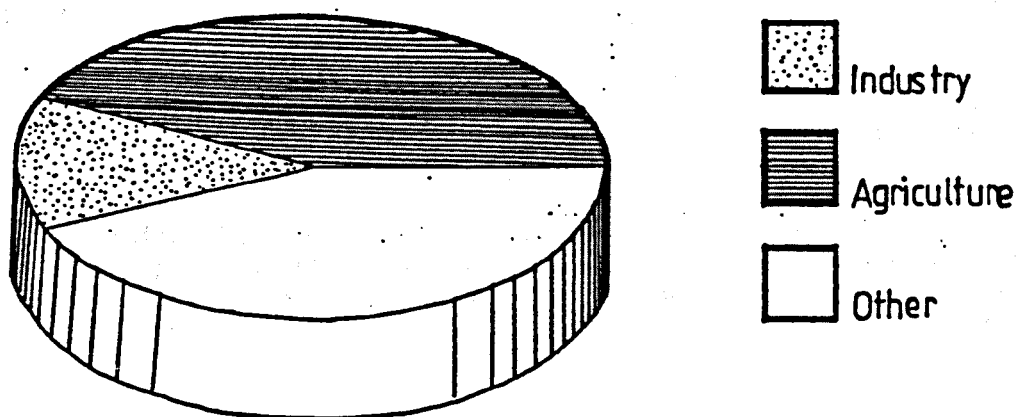


Fig. 9 : Resources

1.4 HISTORY ⁹

Bangladesh was ruled by a succession of Hindu and Buddhist Kings till the 13th century A.D., which included different dynasties like Khagdar (650-700 A.D.), Devas (750-800 A.D.) and Senas (late 11th century to 1204 A.D.).

The defeat of the last Sena King in 1204 at the hands of Bakhtiyar Khalji, the Muslim ruler of Delhi, marked the beginning of the Muslim rule.

After the defeat of the last independent ruler Nawab Serajuddoulah in 1757 the rule passed into the British East India Company and successively to the British Government, till the partition of India in 1947.

Bangladesh was known as East Pakistan with the termination of British rule and later an independence war in 1971 gave birth to a new nation- Bangladesh. (see Fig.10)

It was during the British rule that the modern developments took place like administrative setup, communications, education, health services, industries etc. The impression of which did not fade away even after the creation of Pakistan and successively Bangladesh. In educational sector specially in medicine, the adoption of British method was prominent.

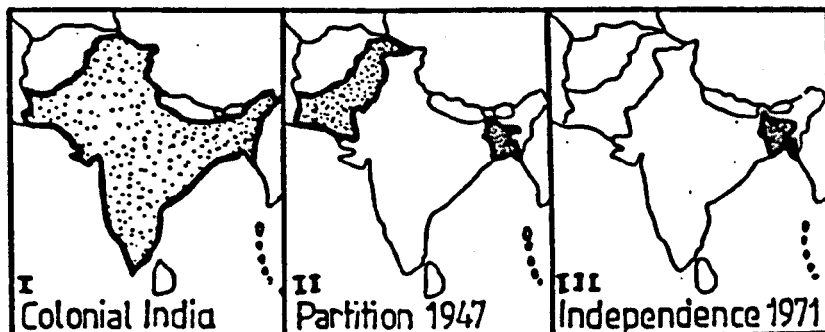


Fig. 10 From colonial rule to independence. Source - ibid 3

Religion :

It was on the basis of 'Religion' that during the partition of India Bengal was divided into Eastern and Western parts - the former became East Pakistan - which after the liberation war in 1971 became Bangladesh.

Though predominantly a muslim country (86.6 %), the official religion being 'Islam', other religions are also found. The breakdown in percentage of population are as follows : Hindu (12.5 %), Buddhist (0.6 %), Christian (0.3%) and others (0.1 %).¹⁰

Language :

The annals of the country show that the country was a part of ' Bharat Barsha ' or Greater India - so the relationship is quite obvious. 'Sanskrit ', now a dead language was widely spoken during the Vedic age. It is the mother of the present day language ' Bangla '- now the official as well as the spoken language of Bangladesh. Though derived from Sanskrit, it has many words well adapted from Persian, English and other Oriental and European languages. These words are widely used in Bangla- just because of their long association with this land.

1.5 RURAL SOCIETY , FAMILY STRUCTURE , TRADITION 11,12

Rural Society :

The core element of social life in Bangladesh is family and kinship. In rural areas the joint family system centred on a common hearth. A homestead usually consists of father, his dependents including married sons with their families. Even if they construct separate houses to shelter their own nuclear families, they remain under their father's authority and their wives, under the authority of the mother-in-law.

Rural society is a male dominated society, where the females are used mainly for house keeping and breeding etc. Early marriage of females and multiple marriage for males, as supported by religious belief, all result in quick growth of population.

'Purdah' or the seclusion of women is practised both in rural as well as urban areas, but the extent varies depending upon family. The influence of purdah in vernacular architecture is very strong, as it guides the design of homesteads. In some families male doctors are not even allowed to check-up a female patient, face to face , specially if she is a gynaecological one. Usually they remain under a veil or partitioned by a curtain.

Family structure :

Family structure is mainly joint or extended where the eldest male member reserves the right of decision making power. Generally household members hold a common property and have meal from the same kitchen. Married sons stay with their father until his death and afterwards the eldest one become the head of the family. A recent trend among urban young couples is towards the nuclear family. Marriage is considered to be a social contract. The marriageable age of women in rural areas vary between 9 and 18 years. A male child in most of the families is considered as an old age pension and the parents try to have at least two living sons.

Tradition :

Though mainly a muslim country - and even the British Government partitioned Bengal on this basis - much of its culture and traditions are indigenous, mainly agrarian based . Harvest and nature are the two major elements of culture in the rural society. Major festivals take place after the new harvest in the winter season . With the change of season the villagers also adapt themselves with changes and the living style also changes.

Folk song, dances, fairs, jatra (open air theatre) etc. are part and parcel of our cultural heritage where also nature, harvest and rivers are prominent. The religious festivals like Eid for Muslims , Puja for Hindus etc. have also become an integral part of our tradition.

1.6 GOVERNMENT STRUCTURE

Bangladesh is a republic with an established parliamentary democracy. The country is governed by political government of presidential form. The President is the head of the state and also chairman of two vital organs of the Government, the NEC, which deals with national economic planning and development and the NPC which deals with problems of population growth. There are Vice-president, Prime-minister, Deputy Prime minister, Ministers of State and Deputy ministers. The Vice President, Prime minister and ministers are in charge of one or more ministries.

The country is divided into 4 Divisions, 64 districts and 460 upazillas (formerly known as thana or police station) for the convenience of administration. Several households constitute a village, 4 to 5 villages constitute a ward, 2/3 wards constitute an union and around 10 unions comprising 20,000 people in each constitute an upazilla. The commissioner of divisions and deputy commissioners of districts exercise full authority in matters of general administration, maintenance of law and order, internal security and collection of revenue.

After a major administrative reorganisation in 1984 by the present Government the present three tiered system was introduced. Previously it was a four tiered system with divisions, districts, sub-division and upazilla. Later the subdivision has been abolished and upgraded into district.¹³
(see Fig. 11)

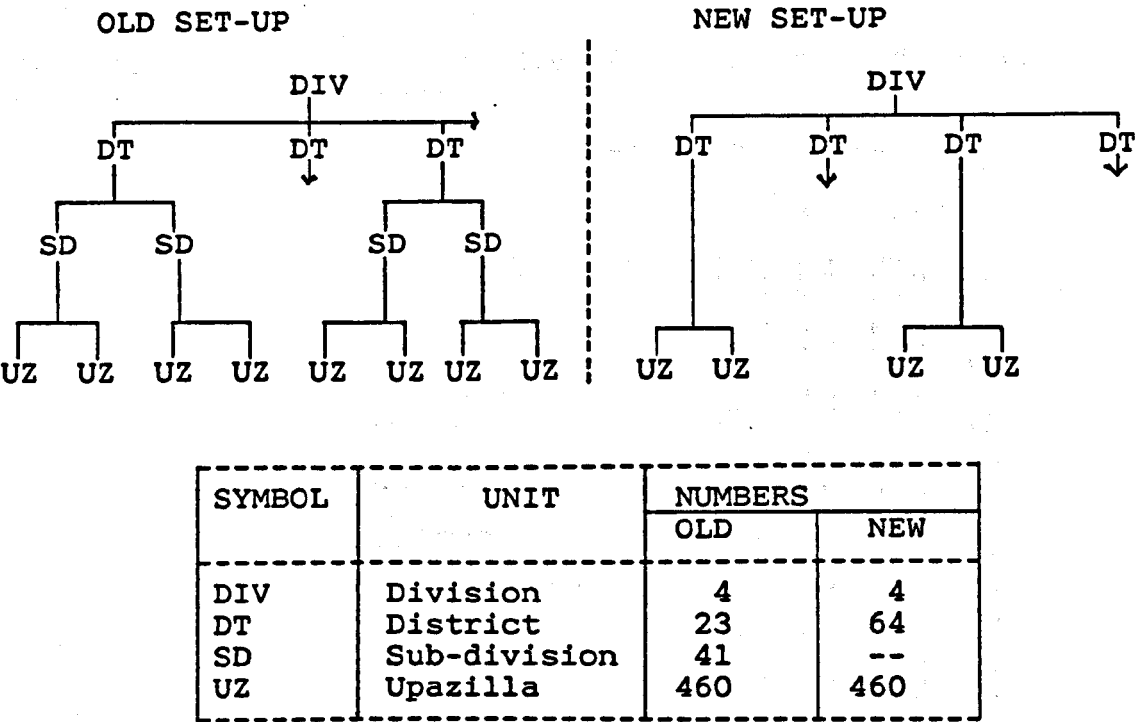


Fig. 11 Administrative Reorganisation in Bangladesh
Source - ibid 3

2.1 PATTERN OF DISEASES :

Malnutrition :

Protein energy malnutrition is widespread among children affecting mostly 1-4 year old child. Inadequate food intake, a diet pattern deficient in protein, vitamins and minerals, worm infestation and diarrhoea are the major causes of malnutrition, affecting the health of more than half of the population in Bangladesh. More than 10 million children under 5 years of age suffer from protein caloric malnutrition. About 50,000 children are affected by Vitamin A deficiency annually and one third of them become blind every year.¹⁴ Malnutrition is also very common among expectant and lactating mothers.

Communicable diseases :

Malaria and tuberculosis still continued to be major causes of mortality and morbidity among the population. Other communicable diseases like Cholera, Diarrhoea, Diphtheria, Tuberculosis, Measles etc. also cause the majority of deaths (Table 4). Infectious diseases originate from unsanitary environmental conditions and lack of personal hygiene.

Some non-communicable diseases of Bangladesh :

Peptic ulcers, Cirrhosis of liver, Cardiovascular diseases, Diabetes, Cancer, Blindness, Mental disorders and various skin diseases also occur.

The table : 2 shows disease pattern and major causes of mortality and morbidity.

BANGLADESH MORBIDITY PROFILE, 1987-1988

Disease	1987		1988	
	Number	%	Number	%
Diarrhoeal diseases	6011166	17.48	6344282	17.30
Intestinal worm infestations	4828036	12.21	3729587	12.08
Skin diseases	4173825	10.58	3061846	9.88
Peptic ulcer	3066136	9.76	2969741	9.68
Anaemia	3308808	8.38	2802436	8.43
Acute respiratory infections	3178007	8.04	2611025	8.13
Pyrexia of unknown origin	1622796	4.10	1959653	6.35
Deficiency diseases	2307243	5.84	1894559	6.13
Eye diseases	1856839	4.69	1549369	5.02
Ear diseases	1855884	4.69	884586	2.86
Injuries	977161	2.47	878621	2.85
Dental diseases	923843	2.34	795544	2.58
Asthma	652028	1.65	492041	1.59
Night blindness	659621	1.67	452693	1.47
Whooping cough	540786	1.37	327484	1.06
Obstetrical and gynaecological complications	373635	0.94	327901	1.06
Clinical malaria	428788	1.09	247792	0.80
Measles	228770	0.58	156643	0.51
Hepatitis	245547	0.62	151967	0.49
Hypertension	169315	0.43	128463	0.42
Mental diseases	68837	0.17	123198	0.39
Poisoning	54302	0.14	103405	0.34
Tuberculosis	140911	0.36	103236	0.33
Diabetes mellitus	71083	0.18	53440	0.17
Filariasis	39373	0.10	20470	0.07
Chicken pox	14350	0.04	16844	0.05
Tetanus	23542	0.06	9971	0.03
Diphtheria	13363	0.03	4943	0.02
Kala-azar	10287	0.04	3060	0.01
Total Reported	3953409	100.00	30885604	100.00

Table 2

3.0 PLANNING / DESIGN / CONSTRUCTION OF HEALTH CARE BUILDINGS

3.1 PROVISION OF HEALTH BUILDINGS

Funding :

Health budget for public sector is based on 5 year strategic and 1 year operational plans by Ministry of Health and Ministry of Finance and approved by Planning Commission. A good number of health related projects are also financed by foreign governments or agencies. These are also managed by Ministry of Health and Planning Commission.

Private health buildings are sponsored by private sector. International, multilateral, bilateral and private voluntary agencies contribution in the field of health and health related projects are also remarkable.

Current and long term building programmes :

The development of health buildings under the current plan (1985-90) contains the following:¹⁵

- a. Completion of the remaining 115 UHC, so that there is one in each of the 460 upazillas.
- b. Completion of all the 4,500 UHFWC's, one in each union
- c. Expansion of 43 existing 50 bed district hospitals to 100 beds in each
- d. Upgrading of 9 existing 100 bed district hospitals
- e. Establishment of 11 new 100 bed district hospitals in new districts.

The private sector does not have any specific building programme. The programme is mainly based on individual or group initiative, without any emphasis on real need for such facilities.

Finance in terms of capital costs and running costs :

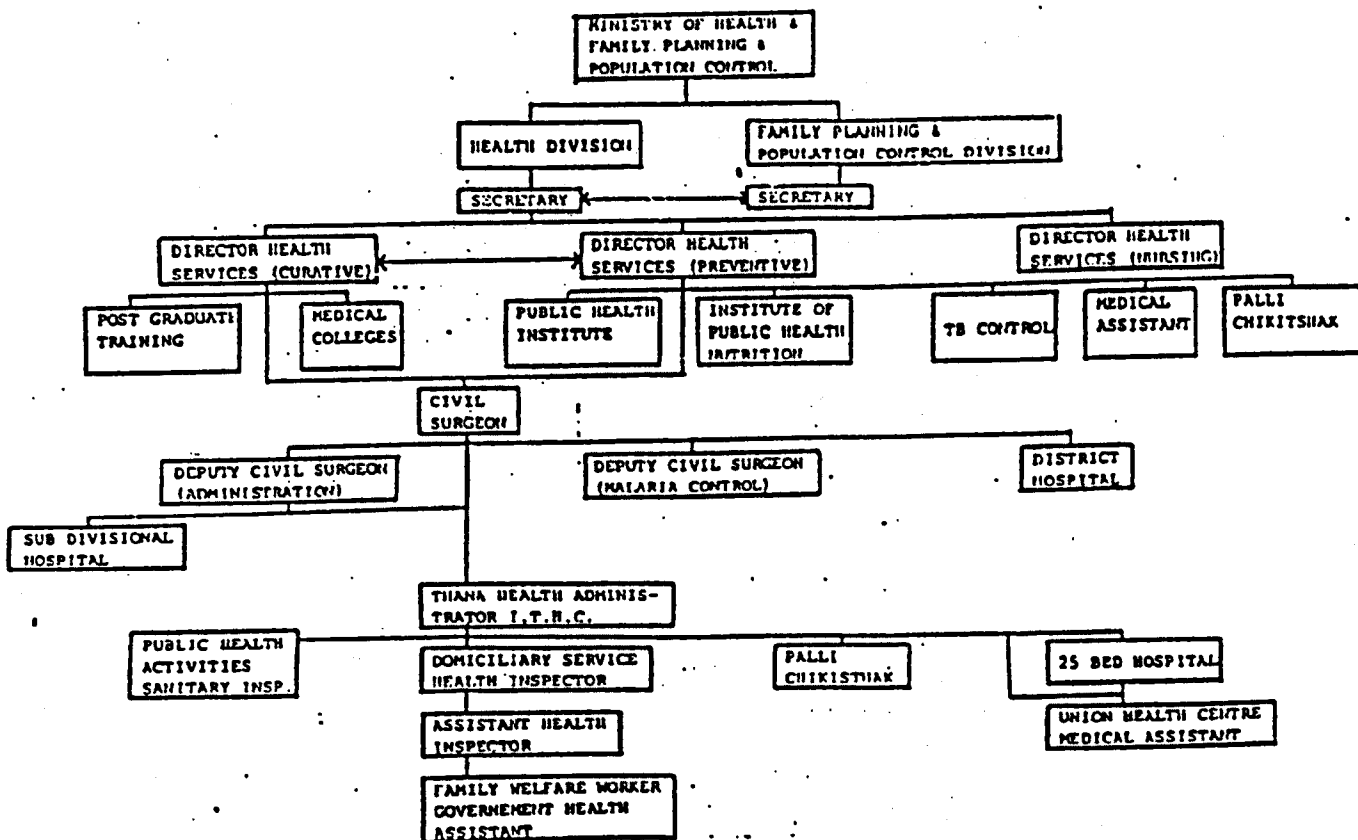
A substantial portion of finance for providing public health buildings come from public expenditure on health and ADP allocation. The finance for the capital and running cost of public health buildings are obtained from the annual and five yearly budget allocation by the Ministry of Health.

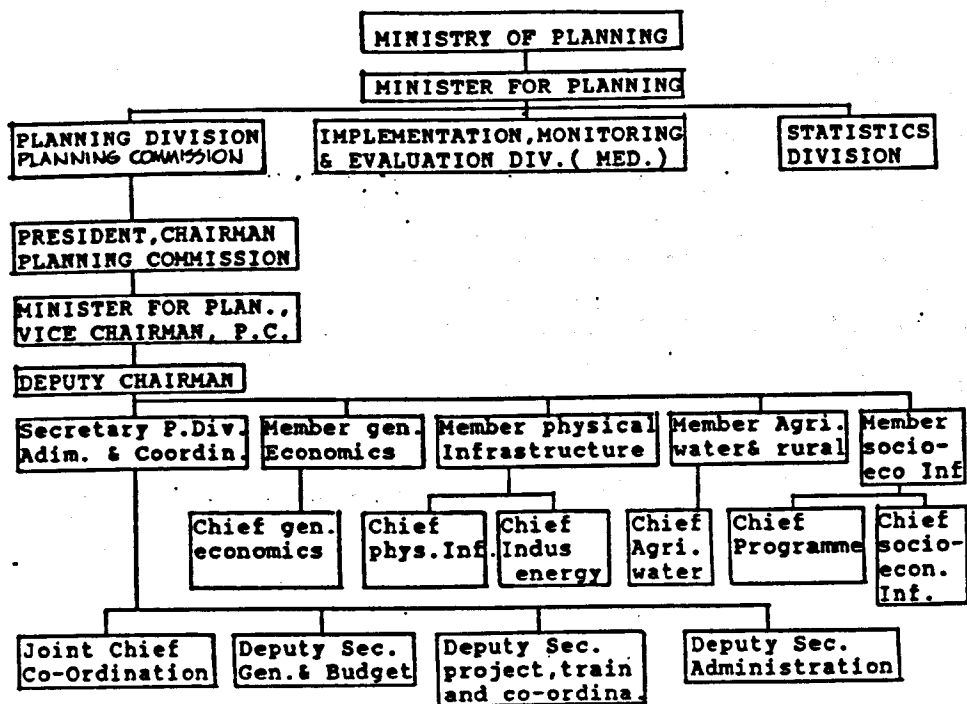
There is also a considerable assistance from international quarters for the health care programme since independence, such as from the International Development Association (IDA). But in these cases the majority of the fund goes for the development of the rural health facilities. In some of the foreign aided projects capital costs are financed by foreign countries but the running cost is financed by Bangladesh Government e.g. Narayanganj District General Hospital.

3.2 PLANNING / DESIGN

The responsibility for planning and administration of the Governments activities in the health sector has been vested on two separate bodies: the Planning Commission and the Ministry of Health Family Planning (MOHFP). The Health and Population Planning section of Planning Commission is directly responsible for the planning, evaluation and approval of all health-related projects. It also has an intersectoral co-ordinating function so that projects impacting on several sectors will be adequately integrated. The MOHFP has the responsibility for the implementation of Health and Population programme. It consists of Health Division and Population Control Division. The Health Division is responsible for all curative and some preventive programs, while the Population Control Division for Family Planning and MCH programs. The responsibility for design of public health buildings goes either to Ministry of Works or to private construction firms. Organisational structure of MOHFP, Planning Commission and Ministry of Works are shown in the following charts (Fig 12).

Planning and design for private health buildings are mainly decided by owner or private organisations. But they have to follow " The Medical Practice and Private Clinics and Laboratories (Regulation) Ordinances, 1982" set by the Ministry of Law and Land Reforms on 27th May, 1982. This is specially important for obtaining licence for establishing a private clinic.





Source : Statistical Year Book of Bangladesh

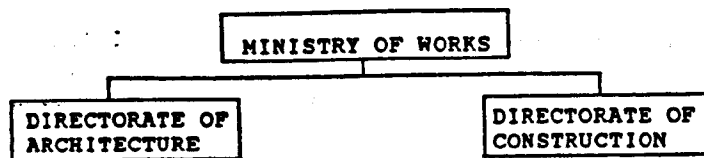


Figure 12 :

3.3 BRIEFING

The brief or the compilation of the programme spell out the following : 16

- i. The role of the hospital in the general health care delivery plan in relation to other services and buildings;
- ii. The scope and range of functions and services to be included in the building;
- iii. The policies for the operation and management of the organisation within the building ;
- iv. A schedule of accommodation ;
- v. Environmental design considerations ;
- vi. A cost target.

Though it was not possible to get a clear outline of briefing procedure through government publications, a generalised idea can be formulated from organisational structure and divisions of different Ministries and Departments. This idea has been developed using some reports, research work on particular projects and the Master Plan for the Population Planning Project. The following chart (Fig.13) shows that the task i. forms part of the government policy plan for 5 years and 1 year ; task ii. and iii. goes to Ministry of Health and Population Control : task iv. goes to Ministry of Works : task v. goes to Ministry of Environment and Population Control Division and lastly task vi. goes to the Planning Commission. Although in each decision making process they draw one or two members from each ministry or division. The chart 1 is for public health project financed by government and chart 2 for a particular project financed by a foreign country.

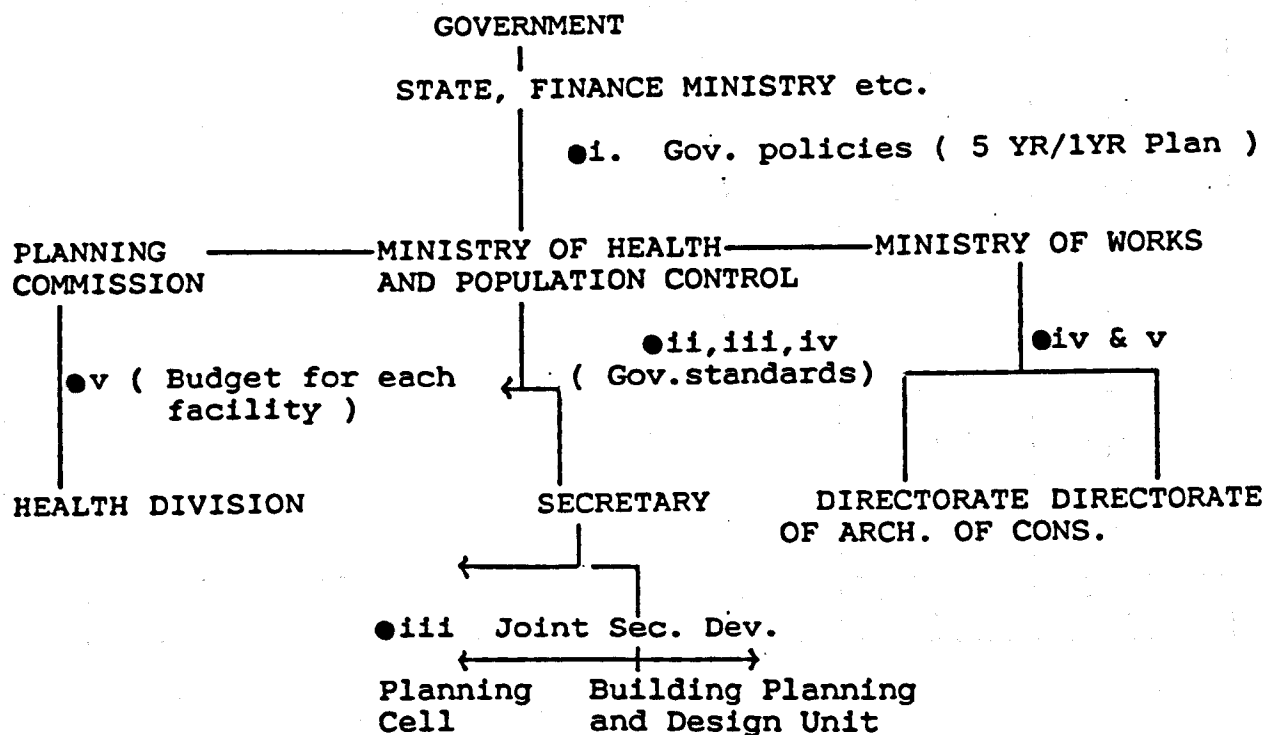


Fig. 13

3.4 NORMS AND STANDARDS

In 1979 the Planning Commission constituted a subcommittee of doctors, administrators, civil servants, architects and engineers to put forward recommendations for the standardisation of hospitals in terms of functional and space requirements, staffing pattern, quantum of land etc. They made recommendations for 50,100 and 200 bed hospitals.¹⁷ These covered the following areas

- a. Bed distribution according to speciality
- b. Standard staffing pattern
- c. Quantum of land for each hospital
- d. Standard floor area (see Table 3)
- e. Expandibility

The land area allocated for all the three sizes appears to be same , 6 to 7 acres which is not logical. The decisions may be taken without the support of extensive studies. The Government circular also mentioned that the recommendations were based on personal experiences and formulated after only threadbare discussions.

Standard space requirements for 50,100 and 200 bed hospitals(m²)

	50 bed	100 bed	200bed
Administrative block including OPD, X-ray, pathology, Emergency & blood transfusion etc.	1115	1487	1858
Ward Block	836	1672	3344
Operation theatre & labour room	223	335	446
Kitchen	93	140	167
Isolation beds for 8 patients	149	149	149
Dead house	19	19	19
Library	28	28	28
Store room	46	74	110
Corridor & passage	112	187	224
Total	2621	4091	6345

Table 3 Standard Floor Area. Source : 3

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A-2 Questionnaire
SURVEY OF UPAZILLA HEALTH COMPLEX (UHC)

Name of the UHC:
 Name of the Upazilla:
 Name of the District:

Date/ Year of
 construction:
 survey date:

-
1. What are the communication network and of mode transportation?
- | | | | |
|--------------------------|--------------------------|----------------------------|--------------------------|
| 1. railway | <input type="checkbox"/> | 1. rail | <input type="checkbox"/> |
| 2. metallic road | <input type="checkbox"/> | 2. bus | <input type="checkbox"/> |
| 3. riverine/ boat | <input type="checkbox"/> | 3. boat/ | <input type="checkbox"/> |
| 4. seasonal road | <input type="checkbox"/> | 4. auto rickshaw, rickshaw | <input type="checkbox"/> |
| 5. others (specify)_____ | | 5. walking | <input type="checkbox"/> |
| | | 6. other specify_____ | |

2. Is there any public health facility of the same nature within the close proximity? Yes ☐ No ☐
 If yes, specify the unit and distance from UHC_____

3. What is the general construction principle?
- | | |
|----------------------------|--------------------------|
| 1. Load bearing brick wall | <input type="checkbox"/> |
| 2. R.C.C. column structure | <input type="checkbox"/> |
| 3. Other specify_____ | |

Construction material Finishes and Present Condition of:

a. Floor			A.Excellent
b. Roof			B.Satisfactory
c. Wall			C.Not very sat
d. Door			D.Fails compl-
e. Window			etely

4. Water supply:
- a. Source: pipe water tube well pond other specify_____
- b. Collection procedure_____
- c. Filtering procedure_____
- d. Capacity/ quantity collected per day_____
- e. Storage_____

5. Drainage and disposal of
- | | type | procedure |
|----------------|------|-----------|
| a. Rain water | | |
| b. Night soil | | |
| c. other waste | | |

6. Electricity
- a. Source_____
- b. Alternative ways_____

7. a. What is the total number of population served by the unit?_____
- b. Name the areas of influence_____

SERVICES AND FACILITIES OFFERED FROM THE UNIT:

<p>a. out-patient services: (tick as appropriate)</p> <p>Basic curative health services <input type="checkbox"/></p> <p>(consultation, examination)</p> <p>MCH including under five <input type="checkbox"/></p> <p>Family Planning <input type="checkbox"/></p> <p>Health education (prev. & prom.) <input type="checkbox"/></p> <p>screening and referral <input type="checkbox"/></p> <p>surveillance and monitoring <input type="checkbox"/></p> <p>other specify_____</p> <hr/> <p>b. Diagnostic and Treatment:</p> <p>radiology <input type="checkbox"/></p> <p>pathology <input type="checkbox"/></p> <p>treatment <input type="checkbox"/></p> <p>injection/ immunisation <input type="checkbox"/></p> <p>emergency <input type="checkbox"/></p> <p>operation <input type="checkbox"/></p> <p>Delivery <input type="checkbox"/></p> <p>Family Planning sterilization <input type="checkbox"/></p> <p>other specify_____</p> <hr/> <p>c. Inpatient</p> <p>accommodation for male, female and maternity <input type="checkbox"/></p> <p>infectious disease <input type="checkbox"/></p> <p>recovery <input type="checkbox"/></p> <p>sanitary <input type="checkbox"/></p> <p>other specify_____</p> <hr/> <p>d. Support services</p> <p>sterilisation <input type="checkbox"/></p> <p>Catering <input type="checkbox"/></p> <p>Linen/ laundry <input type="checkbox"/></p> <p>Supply <input type="checkbox"/></p> <p>Disposal <input type="checkbox"/></p> <p>storage <input type="checkbox"/></p> <p>cleaning and maintenance <input type="checkbox"/></p> <p>other specify_____</p> <hr/> <p>e. Administrative <input type="checkbox"/></p> <p>Teaching and training <input type="checkbox"/></p> <hr/> <p>f. Staff accommodation <input type="checkbox"/></p>	<p>any comment</p> <div style="border: 1px solid black; height: 450px; width: 100%;"></div>
--	---

ADMINISTRATION:

1. Staff:

Category	NO.	Qual. & exp.	F.T/ P.T.	Duties/Responsibilities
Upazilla				
Health Adm.				
Head Asstt./				
Accountant				
Cashier				

Category	NO.	Qual. & exp.	F.T/ P.T.	Duties/Responsibilities
Store keeper				
Clerk/typist				
L.D. Assist.				
Driver				
Junior Mech.				
ANCILLARY STAFF:				
M.L.S.S.				
Ward Boy				
Ayas				
Darwan				
Peons				
Cook				
Mashalchi				
Sweeper				
Other specify				

2. Administrative/ Management structure:

3. Staff amenities

- a. tea_____
- b. Dining_____
- c. toilet_____

4. Teaching and training

- a. For whom:_____
- b. By:_____
- c. Timing:_____
- d. Location:_____

5. Supervision of staff: frequency/ method/ manner

6. What outreach services are provided from the unit and how?

7. What support and services are received from UHC and how?

OUT-PATIENT DEPARTMENT:

1. a. Total number of clinics:

b. Type of clinics: i. General Medical: male ☐ female ☐ combined ☐

ii. Surgical ☐ ☐ ☐

iii. Family Planning ☐ ☐ ☐

iv. MCH including under 5: ☐

v. Other specify _____

I.C.U. Insertion _____

2. Number of patients / day/ month / year: _____

	preventive	curative	emergency
children			
General male, female			
maternity			
total			

av. number of escort/ patient: _____

3. Staff:

type/category	Number	M/F	qual.& experience	duties/respons.
Medical officer				
Family Plan. off				
Family Welfare V.				
Medical Assistant				
Health Inspector				
Assistant H. Insp.				
Sanitary Inspector				
Compounder/dresser				
Laboratory tech.				
X-ray technician				
Other specify				

4. a. Working hour _____

b. peak hour _____

5. Is there any time table? Yes ☐ No ☐

If yes specify _____

6. Operational Procedure:

	participants	procedure, time taken and any specific requirement
a. entry	patient <input type="checkbox"/> staff <input type="checkbox"/> escort <input type="checkbox"/>	on foot priv.& pub transport other
a. Reception	receptionist / clerk	First visit: direct <input type="checkbox"/> appoint <input type="checkbox"/> referred <input type="checkbox"/> subsequent: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
b. Registration		
c. Waiting	participants	procedure, time taken and any specific requirement centralised male/ female sep other

d. Patient call	
e. consultation	
f. examination	
g. treatment immunisation	
f. lab.test	
h. X-ray	
i. dispensing	
j. Record keeping	
k. preventive and health education	
l. Teaching & training	
j. other specify	

7. Referral of patients: procedure/ where to?_____

8. Other services/ facilities:(number, type, spatial quality):
a. sanitary facilities (e.g.staff and patient's toilet)_____

b. drinking water_____

c. storage_____

d. supply of drugs, equipment (source, frequency)_____

e. disposal_____

DIAGNOSTIC AND TREATMENT

1. Laboratory:

- a. Range of tests:_____
- b. Procedure(sample collection, test, result: by whom, where, time)
Out patient_____
- inpatient_____
- emergency_____
- c. Supply of necessities: (from where, frequency)_____
- d. Other facilities (waiting, toilets, washing and cleaning)_____

2. X-Ray:

- a. Number of X-rays taken/ day:_____
 - b. Procedure:
Out-patient_____
 - Inpatient_____
 - emergency_____
 - surgery_____
 - c. Supply of necessities (from where, frequency)_____
 - d. Other facilities (waiting, dress change, dark rm., office, store)_____
 - e. Protection against radiation hazard: _____
- ### 3. Emergency:
- a. daily av. number of patients:_____
 - b. type of cases _____
 - d. procedure:(user, location and method)
reception_____
 - waiting_____
 - treatment_____
 - resuscitation_____
 - observation_____
 - recovery_____
 - admission to ward_____

4. Operating department:

- a. number of surgeries according to speciality/ year:_____
- b. time table:_____
- c. staff:_____
- d. type of cases:_____
- referred cases:_____

e. procedure:

	where	by whom	spatial quality
reception of patient			
anaesthesia			
operation			
recovery			
doctor's change			
,, scrub-up			
nurse's change			
' ' scrub-up			
Other			

f. Storage:_____

g. Recovery (no. of bed, M/F, no. of staff and duties, usage)_____

h. Environmental condition:_____

a. infection control _____

b. light _____

c. ventilation _____

d. smell/ odour _____

5. Delivery:

a. Number of deliveries/ year: normal __ ceasarian _____

b. Staff _____

c. Procedure _____

d. Facilities:

Labour room _____

Sluice _____

supply _____

disposal _____

cleaning _____

INPATIENT DEPARTMENT:

1. Patient accommodation:

type of accomm.	no.	number of beds/ ward	type of arrangement (by speciality, nightingale, rigg
-----	-----	-----	-----
Male ward			
Female ward			
Maternity ward			
Any other infectious disease			
cabin			
-----	-----	-----	-----

2. Provision for new born babies _____
relatives _____
mothers in child ward _____

3. Number of admission/month / year: _____
according to speciality: medicine _ surgery _ gynae _ paediatrics
male, female, _____
children, isolation etc. _____
bed occupancy rate: _____

4. Supervision of patients: _____

5. Category of staff	no.	M/F	qualification & experience	duties
-----	-----	-----	-----	-----
Upazilla Health Off.				
Medical officer				
Staff Nurse				
Midwife				
Other specify				
-----	-----	-----	-----	-----

6. Time table of nurses: (including shifts) _____

7. Facilities: (location, number, spatial quality, user)
Nurses base _____
storage _____
dirty utility _____
clean utility _____
treatment _____
toilet _____

8. Environmental condition
a. light _____
b. ventilation _____
c. noise _____

9. privacy and security

SUPPORT SERVICES:**1. Catering:**a. provided for i. patient ☐ ii. staff ☐ iii. attendants ☐

c. number of meals/ day: _____

d. procedure:

	where	by whom	spatial quality
preparation			
cooking			
delivery			
washing			
storage			

e. type of meal and number of times/day: _____

2. Supply:a. types i. drugs_ii. vaccines_iii. dressings_iv. instruments_
v. medical supplies_vi.stationery_vii.other_

b. procedure

	where	by whom	frequency	spatial quality
procurement				
delivery				
storage				
distribution				

3. Disposal:a. type i. soiled dressing_ii. organic matter_iii. infectious
material_iv. effluent (urine, blood etc.)_v. other_

b. procedure

storage for disposal _____

means of disposal _____

frequency of disposal _____

4. Sterilisation: centralised ☐ decentralised ☐

procedure:	location	frequency/when	method
Theatre linen			
O.T. Instruments			
Gowns and masks			
Gloves			
other instruments			
other			

5. Cleaning:

	method of cleaning	frequency of cleaning
ward		
O.T.		
OPD		
Offices		
Circulation		

6. Laundry:

a. collected by _____ from _____ frequency _____

b. washing (where and method) _____

c. storage _____

d. delivered by _____ to _____ frequency _____

7. Maintenance procedure:

a. building _____

b. equipment _____

44. Individual users (doctor, nurse, patient) comments :
(checklist for discussion)

Doctor and nurse:

- a. Working hour_____
- b. Work load_____
- c. working space provided_____
- d. equipment and furniture_____
- e. environment
light_____
- air/ ventilation_____
- noise_____
- privacy_____
- supervision of patient/ staff_____
- other specify_____
- f. organisation of activity areas_____
- g. other amenities_____
- h. walking distance_____
- i. What are the problems you suggest to be taken care of?_____
- j. What are the needs regarding service, space, equipment
etc.?_____
- k. Can you suggest any improvement?_____
- l. What are the good things of the unit?_____
- m. What are the bad things of the unit?_____

Patient:

- 1. Distance of the unit from home?_____
- 2. Services of doctors and nurses_____
- 3. medical treatment_____
- 4. facilities provided_____
- 5. any comment on facilities, services and environment_____

SURVEY OF A UNION HEALTH FAMILY WELFARE CENTRE (UHFWC)

Name of the UHFWC:

Year of construction

Union:

Date of survey:

Upazilla:

1. What are the communication network and of mode transportation?

- | | |
|--|---|
| 1. railway <input type="checkbox"/> | 1. rail <input type="checkbox"/> |
| 2. metallic road <input type="checkbox"/> | 2. bus <input type="checkbox"/> |
| 3. riverine/ boat <input type="checkbox"/> | 3. boat/ <input type="checkbox"/> |
| 4. seasonal road <input type="checkbox"/> | 4. auto rickshaw, rickshaw <input type="checkbox"/> |
| 5. others (specify)_____ | 5. walking <input type="checkbox"/> |
| | 6. other specify_____ |

2. Is there any public health facility of the same nature within the close proximity? Yes ☐ No ☐
If yes, specify the unit and distance from UHFWC:_____

3. What is the general construction principle?

- | | |
|----------------------------|--------------------------|
| 1. Load bearing brick wall | <input type="checkbox"/> |
| 2. R.C.C. column structure | <input type="checkbox"/> |
| 3. Other specify_____ | |

Construction material, Finishes and Present Condition of:

a. Floor				A.Excellent
b. Roof				B.Satisfactory
c. Wall				C.Not very sat
d. Door				D.Fails compl-
e. Window				etely

4. Water supply:

a. Source: pipe water ☐ tube well ☐ pond ☐ other specify

b. Collection procedure :_____

c. Filtering procedure:_____

d. Capacity/ quantity collected per day:_____

e. Storage:_____

5. Drainage and disposal of:

	type	procedure
a. Rain water		
b. Night soil		
c. other waste		

6. Electricity:

a. Source _____

b. Alternative ways _____

7. a. What is the total number of population served by the unit?_____

b. Name the areas of influence _____

8. a. total number of out-patient clinics _____
 b. total number of beds (if any) _____

9. Working hour: _____

10. Staffing pattern:

Category of staff	Number of staff	Qualification Experience	Full/Part time	Duties
-----	-----	-----	-----	-----
Medical Assistant				
Family Welfare Vis.				
Auxiliary nurse				
Pharmacist/ Lab. assistant				
clerical staff				
ancillary staff				
Family Welfare Worker				
Other (specify)				
-----	-----	-----	-----	-----

11. Number of patients:

a. number of out-patient/ year and per day av.: _____
 General O.P.(M,F) Children Maternity Family Planning

b. average number of escort/ patient: _____

c. number of emergency patients/ year _____

12. a. What are the services delivered from the unit?

- i. Mother and Child Health including Under 5 services ☐
- ii. Basic Health Services (curative) ☐
- iii. Family Planning Services ☐
- Sterilization/ operation
- iv. Health Education (preventive and promotive) ☐
- v. Screening and referral ☐
- vi. support services ☐
- vii. surveillance and monitoring ☐
- viii. teaching and training ☐
- ix. any other specify _____

13. What are the main health problems of the union?

- a. preventive _____
- b. promotive _____
- c. curative (include list of diseases treated) _____

14. Does the community participate in the health care delivery and how? _____

15. Patients and staff arrive at the clinic
- | | Patient | Staff |
|--------------------------------|--------------------------|--------------------------|
| a. on foot | <input type="checkbox"/> | <input type="checkbox"/> |
| b. public or private transport | <input type="checkbox"/> | <input type="checkbox"/> |
| c. in a wheelchair | <input type="checkbox"/> | <input type="checkbox"/> |
| d. other _____ | | |
-
16. Patients accompanied by
- | | |
|-------------------------------|--------------------------|
| a. children | <input type="checkbox"/> |
| b. other friends or relatives | <input type="checkbox"/> |
| c. staff | <input type="checkbox"/> |
-
17. Patients received and directed by
- | | |
|----------------------|--------------------------|
| a. receptionist | <input type="checkbox"/> |
| b. clerk | <input type="checkbox"/> |
| c. other staff _____ | |
-
18. Mode of contact for first and subsequent visit
- | | first | subsequent |
|-------------------------------|--------------------------|--------------------------|
| a. direct access | <input type="checkbox"/> | <input type="checkbox"/> |
| b. appointment | <input type="checkbox"/> | <input type="checkbox"/> |
| c. referred by lower facility | <input type="checkbox"/> | <input type="checkbox"/> |
| d. other specify _____ | | |
-
19. Referral of patients: procedure/ where to? (including emergency cases) _____
-
20. Registration procedure
- | | |
|--|--------------------------|
| a. clerk/receptionist make note for first/sub. visit | <input type="checkbox"/> |
| b. other specify _____ | |
-
21. Services/ functions provided from reception/ waiting
- | | |
|--|--------------------------|
| a. guidance to waiting, toilet, source of drinking water | <input type="checkbox"/> |
| b. any query | <input type="checkbox"/> |
| c. receive specimen | <input type="checkbox"/> |
| d. receive emergency patients | <input type="checkbox"/> |
| e. patient call from waiting to C/E, Treatment etc. | <input type="checkbox"/> |
| f. supervision of main entrance, waiting area | <input type="checkbox"/> |
| g. record keeping | <input type="checkbox"/> |
| h. health education | <input type="checkbox"/> |
| i. other specify _____ | |
-
22. Waiting area
- | | |
|---|--------------------------|
| a. centralised | <input type="checkbox"/> |
| b. decentralised (divided into sub-waiting) | <input type="checkbox"/> |
| c. Male-female separation | <input type="checkbox"/> |
| d. Other _____ | |
-
23. Sanitary facilities:(number, male-female, type)
- for patient _____
- staff _____
- Drinking Water: _____
-
24. Patient call system
- | | |
|---------------------------|--------------------------|
| a. first come first serve | <input type="checkbox"/> |
| b. use of number cards | <input type="checkbox"/> |

c. other method specify_____

25. Record handling procedure

a. what type of records_____

b. centralised ☐ decentralised ☐

c. prepared by_____ at_____

d. collected by_____ sent to_____

26. Activities associated with C/E of gen. O.P.; MCH;F.P.;under 5

a. history taking

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

b. physical examination

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

c. weighing

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

d. simple pathological investigation

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

e. prescription of drugs

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

f. immunisation

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

g. referral to higher level

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

h. storage of medicine, vaccine etc.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

i. consultation with visiting doctor

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

j. data collection, compilation

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

k. preventive and promotive services, health education

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

l. treatment

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

m. dispensing

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

n. other specify_____

27. Laboratory test:

a. done by_____

b. specimen collected at_____ done at _____

c. tests done_____

d. tests referred_____

28. Treatment

a. centralised ☐ decentralised ☐

b. done by_____ at_____

c. procedure_____

29. Family Planning: Operation and recovery

a. time table:_____

b. staff_____

c. procedure_____

d. number of beds for recovery_____

30. Dispensing

a. centralised ☐ decentralised ☐

b. male/ female separation ☐

c. done by_____

d. timing_____

31. Health Education

a. for_____

b. by_____

c. timing_____

d. location_____

32. Teaching and training:

a. for_____

- b. by_____
- c. timing_____
- d. location_____

33. Equipment sterilisation

- a. items for sterilisation_____
- b. procedure_____
- c. location for each stage_____

34.	Supply: item	source	received by and where	frequency
a.	drugs			
b.	equipment			
c.	linen			
d.	other specify			

35. Storage and distribution:

- a. centralised_____
- b. by_____
- c. procedure_____

36. Disposal of used item:

- a. done by_____
- b. method_____

37. Staff amenities_____

38. Laundry

- a. collected by_____from_____frequency_____
- b. washing(where and method)_____
- c. storage_____
- d. delivery by_____to_____frequency_____

39. Cleaning, maintenance, gardening, portering

- a. by_____
- b. timing_____

40. Management Structure

41. Supervision of staff: frequency/ method/ manner_____

42. What outreach services are provided from the unit and how?

43. What support and services are received from UHC and how?

SURVEY OF UPAZILLA HEALTH COMPLEX (UHC):

Table:1 Name of the UHC/ Upazilla and District, Year of construction, survey date and catchment population.

Name of the UHC/Upazilla and District	Date of Survey	Year of Construction	Population Official from UHC 87-88	
A.DHAKA DIVISION:				
1. Bhaluka, Mymensing	19-11-91	1983	216693	-
2. Shibpur, Narsingdi	20-10-91	1984	194378	-
3. Goalandaghat, Rajbari	03-02-92	1960/65	77268	77598
B.KHULNA DIVISION:				
1. Bakergonj, Barisal	25-11-91	1968	312468	341661
2. Mohammadpur, Magura	12-11-91	1984	145406	160816
3. Kolaroa, Satkhira	29-12-91	1968	150483	100000
C.CHITTAGONG:				
1. Begumgonj, Noakhali	12-01-92	1974	588815	650000
2. Rajan, Chittagong	05-02-92	1983	267875	300000
3. Chattak, Sunamgonj	11-03-92	1983	215777	275000
D.RAJSHAHI:				
1. Puthia, Rajshahi	15-03-92	1983	126994	-
2. Ranisankail, Thakurgaon	24-02-92	1984	122836	143560
3. Ishwardi, Pabna	01-03-92	1960-65	211483	265703

Note: The above serial numbers for each unit are used for presenting survey results. For example A.1 stands for Bhaluka, Mymensing.

Q.1.a. What are the communication Network:(with District Headquarter)

	A			B			C			D		
	1	2	3	1	2	3	1	2	3	1	2	3
1. Railway	x	x	x	x	x	x	/	x	/	x	x	/
2. Metallic Road	/	/	x	/	/	x	/	/	/	/	/	/
3. Riverine/Boat	x	x	/	/	x	/	x	x	/	x	x	x
4. Seasonal road	/	/	/	/	/	/	x	/	x	/	/	/
5. Other e.g Katcha /temporary road	x	/	x	x	x	/	x	x	x	x	x	x

Q.1.b Mode of transportation (for patient and staff)

	A			B			C			D		
	1	2	3	1	2	3	1	2	3	1	2	3
1 Rail	x	x	x	x	x	x	/	x	/	x	x	/
2. Bus	/	/	/	/	/	/	/	/	/	/	/	/
3. Boat	x	x	/	/	x	/	x	x	/	x	x	x
4. Auto rickshaw rickshaw	/	/	/	/	/	/	/	/	/	/	/	/
5. Walking	/	/	/	/	/	/	/	/	/	/	/	/
6. Other												

Q.2 Is there any public health facility of the same nature within the close proximity:

	A			B			C			D		
	1	2	3	1	2	3	1	2	3	1	2	3
1. Yes	/	/	/	/	/	/	/	/	/	/	/	/
2. No	x	x	x	x	x	x	x	x	x	x	x	x
Distance in Km	15	12	3	20	12	12	10	12	15	20	12	26

Q.3.a. What is the general construction principle

	A			B			C			D		
	1	2	3	1	2	3	1	2	3	1	2	3
Load bearing brick wall	/	/	/	/	/	/	/	/	/	/	/	/
R.C.C Column and Beam structure												
Other specify	R.C.C. beam used in large span areas e.g ward,											
Mixed	waiting, brick/r.c.c. column (see plans)											

Q.3.b Construction material and finishes

	Construction material		Finishes	
	Old	New	Old	New
Floor	patent stone	same as old	neat cement finish	terrazzo in toilet, stair,OT,X-ray
Roof	Flat R.C.C slab (m/s rod, brick chips, cement, sand)	same as old type	water proofing in top ceiling :lime terracing, inside white wash	same as old type
Wall	Brick(load bearing 10",nonload bearing parti. wall-5", 3")	same	int. and ext. cement plaster and lime wash	ext. exposed 1st class brick, flush pointing. interior same as old.
Door	timber planks frame and shutter	m/s angle for frame, wooden shutter	several coats of enamel paint	same
Windows	timber frame and glazed window ms grill	m/s angle and glazed ms grill	timber painted (enamel paint)	m/s angle painted

Q.3.c Present condition:

	A			B			C			D		
	1	2	3	1	2	3	1	2	3	1	2	3
Floor	B	B	B	B	A	B	B	B	B	B	B	A
Roof	B	B	B	B	A	B	B	B	B	B	B	A
Wall	B	B	B	A	A	B	B	B	B	A	B	A
Door	B	B	B	B	A	B	B	B	B	B	B	A
Window	B	B	B	B	A	B	B	B	B	B	B	A

Q.4 Water Supply:

- a. Source: All UHC have pipe water supply and tube well
- b. Collection procedure: For pipe water supply each have overhead water tank and pump. Example. In Bhaluka pumped twice per day.
Tube well: Deep tube well
- c. No such filtering procedure
- d. Capacity: no data available. Adequate supply in each.
- e. Storage: overhead water tank.

Q.5 Drainage and disposal of

- a. Rain water: Surface drain, used ground slope
- b. Night soil: Inspection pit to septic tank
- c. Other waste: Septic tank, soak well

Q.6. Electricity:

- a. Source: All health complexes have electric supply from Rural Electrification Board.
No other alternative ways of supply, other than kerosine lamp
No gas.

Q.7.a Catchment population: see table 1.

serve whole upazilla, sometimes nearby upazilla, due to close proximity and easy accessibility.

SERVICES AND FACILITIES OFFERED FROM THE UNIT:

See the main text, Table 5.2

ADMINISTRATION:

Q.1 Staff: in the main text Table 5.3

Q.2 Administrative /management structure: in the main text, Fig. 5-23

Q.3 Staff amenities:

- a. tea: no specific tea area, organised by peon/ mlss
- b. Dining: no dining facility for staff
- c. Toilet: Attached and common toilets (see plans)

Q.4 Teaching and Training:

- a. For whom: H.A., F.W.A., F.W.V., M.A., A.H.I., H.I.
- b. By : UHFPO, MO(MCH), Civil Surgeon (DH), TFPO, SI, HI
- c. Timing : no fixed schedule
example- once/month for 5 days (10 am to 4 pm)
- d. Location: Reception/waiting area (in new type plans)
X-ray room (Bakergonj)
Puthia, Raojan, Chattak (proper class room)
(see plans)

Q.5 Supervision of staff: frequency, method, manner

- Irregular
- By Civil Surgeon from DH, mostly prearranged, once or twice per month.

Q.6 What outreach services are provided?

- supervision of RDs and UHFWCs
- send MO and supporting staff for F.P. sterilisation
- send EPI technicians to satellite clinics, 3 days per week.
- Field workers to satellite clinics
- services provided by H.I. and A.H.I.

Q.7 What support and services are received from D.H.?

- drugs, medicine, X-ray films, laboratory reagents and other supplies
- supplied from DRS office, approved by Civil surgeon.

OUT-PATIENT DEPARTMENT:

Q.1.a Total number of clinics:

	A:1	2	3	B:1	2	3	C:1	2	3	D:1	2	3
Number of clinical rooms	7	6	5	6	5	5	4	9	7	6	7	8

Q.1.b. Types of clinics:

	A:1	2	3	B:1	2	3	C:1	2	3	D1	2	3
i. General Medical, Surg, Gynae												
All comb. for M/F	/	/	/	/	/	/	/	/	/	/	/	/
ii. Family Planning	/	/	/	/	/	/	/	/	/	/	/	/
iv. MCH including under 5	/	/	/	/	/	/	/	/	/	/	/	/
v. Other a. Dental	/	/	/	x	x	x	/	x	/	x	x	x
b. Eye												
c. ENT												
d. leprocy	x	x	x	x	x	x	x	x	/	/	x	x

Q.2 Number of patients/ day/ month/ year:
See the main text: Table 5-7

Q.3 Staff: see table 5-3

Q.4.a Working hour: 8 am to 2 pm, Six days a week

Q.4.b Peak hour:

	A	B	C	D
1.	11-12	10-1	10-12	10-1
2.	10-12	10-12	10-1	11-1
3.	11-12.30	11-12.30	11-12	10-12

Q.5 Is there any time table? There is no time table for Doctors. They usually work within the working hour.

Q.6 Operational procedure:

	Participants	Procedure:time taken and any sp. requirem.
a. Entry	Patient Staff Escort	on foot, private/public transport
b. Reception /clerk	receptionist	Direct for both first and subsequent visits
c. Registration by clerk		in registration book (name, sex, no), give a ticket (patients serial no, name, age and clinic number) and direct to the room.
d. Waiting	all O.P.	centralised for male and females
e. Patient call	peon/clerk	direct to the specific room, self initiative.
f. consult.	MO and patient	1 min to 1-1/2 minutes
g. Examina.	..	rare
h. treatment	..	in emergency
immunisa.	EPI tech,patie.	2 days/week for out-patient and 3 days

Participants		Procedure: time taken and any sp. requirem.
		for out-door visit, satellite clinics, UHFWCs
i. Laboratory test	patient, escort Lab tech.	see lab
j. X-ray	X-Ray tech	see x-ray
k. dispensing	pharmacist	limited list of medicine, separate slip, only mixture prepared in disp., daily supply from store on requisition
l. Record	MO/Assistant	register name, age, treatment given, keeping amount of drug
m. preventive	field staff F.P. staff	only in F.P. clinics and field level
n. teaching and train		see q.4

Q.7 Referral of patients: procedures/ where to?

Referral note to District Hospital, T.B. hospital, Cancer hospital and leprocy hospital.
From lower level only verbally.

Q.8 Other services and facilities (number, type, spatial quality)

- Sanitary facilities: staff and Patient's toilet - see plans
- Drinking water: tube-well and tap water
- Storage for medicine, EPI vaccine, F.P., other
- Supply of drugs, equipment: by DRS on requisition
- Disposal: no standard procedure, collected in open bucket/ bin by sweeper.

DIAGNOSTIC AND TREATMENT:

Q.1 Laboratory:

- Range of tests: Routine pathological test
Blood (T.C., D.C.), stool, urine, sputum, malaria (field)
- Procedure (sample collection, test, result: by whom, where, time)
Outpatient: patient is sent with a ticket to laboratory for test;
sample given in the lab. by patient: blood in the lab., other from home/
use attached in new/ O.P. toilet in old type. After investigation result
written on ticket, collected by patient to respective doctor.

Inpatient: Blood collected by laboratory assistant from ward;
stool, urine sent by staff nurse through aya/ ward boy/ sweeper with a
request form. Result is sent to the respective doctor through ward nurse.

Emergency: Rarely done. If necessary on call basis.

Field samples: samples sent by field staff (e.g. malaria)
usually 1000-1500/ month.
(working hour: 9am to 5pm)

- Supply of necessities: (from where, frequency)
 - collected from DRS under civil surgeon
 - on requisition,
- Other facilities (waiting, toilets, washing, cleaning)

New type plan: waiting outside the laboratory on corridor, attached toilet.
washing and cleaning within lab.
Old type: no specific waiting, toilet and basin for cleaning
(see plans)
New types: no specific problem with light and ventilation
Old: lack of adequate light e.g. Bakergonj, Begomgonj..

2. X-Ray:

2a. Number of X-rays taken/ month:

A			B			C			D		
1	2	3	1	2	3	1	2	3	1	2	3
x	70	30	x	x	x	x	x	26	60	x	x

2b. Procedure: O.P.: patient is sent with x-ray advise to x-ray room, x-ray taken, prcessed and result sent to M.O. by peon/ patient.
Inpatient: patient is sent with nurse/aya/w.boy with advice file, report is sent through them to nurse, nurse to doctor.
Emergency: rare
Surgery: same as in-patient

2c. Supply of necessities: (from where, frequency)
-requisition is sent to District Supply Office through store keeper, supply comes to the main store. Radiographer brings necessary films on requisition from store (100-200/box)
inadequate supply.

2d. Other facilities
waiting: outside in the verandah, no dress change room, no specific office space; have X-Ray and dark room, with or without store

2e. Protection against radiation hazard:
Apron is used to protect radiation hazard. No other means.

3. Emergency:

a. Daily average number of patients:

A			B			C			D		
1	2	3	1	2	3	1	2	3	1	2	3
10	19	21	x	18	15	20	11	x	20	12	10
50 max.											

b. accident, abscess, burn, diarrhoea, drowning, injury, poisoning

c. Procedure: (user, location, method)
Minor in emergency room (stitching, dressing), major to O.T. or D.H.
Reception: direct to the emergency room.
Waiting: inside emergency room
Treatment: First aid is given inside emergency room, other admitted to ward.
Resuscitation: Oxygen, fluids inside emergency room.
Observation: in emergency
Recovery: in ward after admission, no separate provision
Admission to ward: from emergency by EMO.
Staff: MO in-charge, 1 ward boy, 1 nurse

4. Operating Areas:

A. Number of surgeries according to speciality/ year:

A			B			C			D		
1	2	3	1	2	3	1	2	3	1	2	3
x	x	36	x	60	x	x	x	x	15-20	60-65	72

B. Time table: no time table is maintained, depends on patient.
C. Staff: MO (MCH), MO (Emergency), UHFPO, FWV, O.T. nurse, wardboy
D. Type of cases: minor

Referred cases: major

E. procedure

	Where	By whom	Spatial quality
Reception of patients	O.T./corridor	O.T. nurse	no separate space/ arrangement
Anaesthesia	O.T.	Doctor	use ether
Operation	O.T.	Doctor	see plans
Recovery	main ward		no special arrangement
Doctor's change	New: separate Old: no prov.		see plans
Scrub-up	all have basin		
Nurse's change	New: sep. prov Old: no prov.		
Nurse's scrub-up	shared with doctors		

F. Storage: adjacent to O.T.

G. Recovery (no. of bed, M/F, no of staff and duties, usage)
No separate recovery bed, in main ward

H. Environmental condition:

- i. infection control: no particular precaution, cleaned as other areas before operation
 - ii. light: adequate in old, over provision in new.
 - iii. ventilation: adequate
 - iv. smell/ odour: no problem
- In two UHCs, ambulances in working condition

5. Delivery:

- a. Number of deliveries/year: all normal, no caesarian
5 to 20 per month average.
- b. staff: MO (MCH), FWV, Nurse/midwife, aya
- c. procedure: admission through emergency to female ward (old type) or labour ward (new type), A.N. care, delivery, P.N. ward/ female ward for P.N. care, discharge. Complicated cases referred to DH or any near by hospital.
- d. Facilities: (see individual plans)
Labour \room: all .
Sluice: adjacent to labour room in new type.
supply: from central store on requisition.
disposal: disposed in open bin, collected by sweeper.
cleaning: av. 2 times/ day by sweeper

6. IN-PATIENT AREAS:

1. Patient accommodation:

* in the text Table 5-8

2. Provision for new born babies: in P.N. room near ward for new types, old types within female wards
- | | |
|------------------------|---|
| relatives | within wards |
| mothers in child ward: | allowed mothers to stay with child patient in female wards. |

3. Number of admission/ month/ year

* in the text Table 5-8

4. Supervision of patients: by nurse for medical care. Relatives takes a major part.

5. Staff: Table 5-3

6. Time table of nurses: 3 shifts: 7am to 2pm (av.2 nurses); 2pm to 8pm (av. 2 nurses); 8pm to 7am (av.1 nurse)
7. Facilities (see plans)
8. Environmental condition
 - a. light adequate. excess during summer, glare problem
 - b. ventilation adequate, have ceiling fan
 - c. noise due excess number of relatives
9. Privacy and security:

No restriction regarding relatives throughout the day
 During night time usually one attendant is allowed
 No major security problem.

SUPPORT SERVICES:

1. Catering:

Run by private contractor

a. Provided for 1. patients only

b. Number of meals/ day: Three - breakfast, lunch and dinner

Item: Breakfast (bread, banana, tea), lunch and dinner (rice, lentil soup, fish with vegetable curry, meat once/ week)

c. Procedure: Where By whom Spatial quality

Preparation	Kitchen	Mashalchi	No separate space, on ground
Cooking	„	Cook	on earthen stove, fire wood
Delivery	Ward	Aya/mashalchi/cook	
Washing	Inside Kitchen/	bathroom/outside	(see plans)
Storage	Store for non-perishable goods		
	perishable-daily supply,		no bulk store for fire wood.

Condition of kitchen: dirty, black patches on walls and roof.

-nurse send request form for normal and diet meal every morning to the cook.

2. Supply:

a. Types: Medical equipment, drugs, medicines, vaccines, dressings, surgical instruments, medical supplies, stationary, utensils, linen, X-ray films, laboratory reagents, oxygen cylinder and other necessities.

b. Procedure:

	Where	By whom	Frequency	Spatial quality
procurement	DRS	approved by civil surgeon	itemwise vary 2-4 times/year depending on item of supply	District level
delivery	store			
storage	central st. Health and F.P. separa. health)	store-keeper (F.P. and health)		
distributio.	individual dpt.			

3. Disposal:

a. Types: soiled dressings, organic matter, infectious materials, effluent and other

b. Procedure:

Storage for disposal Bin /bucket

Means of disposal by sweeper

Frequency once/ day or on requirements

at one corner of the site. Items incinerated or buried as needed.

4. Sterilisation: centralised

Procedure	Location	Frequency/ where method
Theatre linen	New type plans	depends on number of operation
O.T. instruments	attached room	per day or week. Done by O.T.
Gowns and masks	old type plan	nurse, helped by assistant Other
instruments	FWVs room or within O.T.	(ward boy or aya)

5. Cleaning:

	Method of cleaning	Frequency of cleaning
Ward	done by sweeper	1-2 times/ day
O.T.	specially done by sweeper before individual operation	depends on no of operation per day

OPD, offices
and circulation same as wards

- 40% in a good state.

6. Laundry: contract basis.

- Collected by washermen from ward dirty store, Frequency: 3-4 times per month
- Washing: outside (pond/ river, dry in the sun, iron and deliver)
- Storage: in ward store
bed linen not changed regularly, one set per long stay, sometimes more than one for short stay patients.
- Delivery by washermen to staff nurse
Frequency: 3-4 times per month

7. Maintenance procedure:

- Building: P.W.D., not regular
- Equipment: T.E.M., not regular

UNION HEALTH FAMILY WELFARE CENTRES:

Name of the UHFWC/Union, Upazilla, District:

Serial No.	A.Dhaka	B.Chittagong	C.Khulna	D.Rajshahi
1	Tetuljhura Savar	Fazilpur Feni Sadar	Dariapur Bashgram Narail	Kamarpukur Sayedpur Nilphamari
2	Shamvupur Shonargaon	Chowara Comilla	Baradi Alamdanga Chuadanga	Subgram, Bogra
3	Joymontop Singair Manikgonj	Shuhilpur Brahmanbaria	Parahati Jhenaidah Sadar	Tetulia Chirirbandar Dinajpur
4	Kaijuri Kotwali Faridpur	Tamta Shahrasti Chandpur	Mukarimpur Bharamara Kushtia	Kishoregari Palasbari Gaibandah
5	Elenga Kalihat Tangail	Kuakup Ramu Cox's Bazar	Lebutala Jessore Sadar	Ekarachali Taragang Rangpur
6	Birtara Srinagar Munsigonj	Ranihat Rangunia Rangamati	Khazipur Gangni Meherpur	Kamat Kagaldighi Panchagarh
7	Kalika Prasad Bhairab Kishoregonj	Monomukh Moulavibazar	Lebukhali Patuakhali	Chowgram Singra Natore
8	Pubail Gazipur	Paniundha Hobigonj	Jatrapur Bagerhat	Khamar Nowabgonj
9	Laxmigonj Netrokona	Kuchi Sylhet Sadar	Dighalia Khulna	Varsha Naoga

Note: The above serial numbers for each unit are used for presenting survey results. For example A. 1 stands for Tetuljhura, Savar.

Year of Construction:

Serial Number	A.Dhaka	D.Chittagong	D.Khulna	E.Rajshahi
1.	1988	1983	1987	1983
2.	1985	1985	1987	1981
3.	1985	1980	1984	1987
4.	1988	1980	1986	1983
5.	1985	1984	1987	1983
6.	1978	1984	1983	1981
7.	1984	1984	-	-
8.	1983	1983	1983	1984
9.	-	1983	1983	-

Note: - = data not available

Date of survey:

Serial Number	A.Dhaka	D.Chittagong	D.Khulna	E.Rajshahi
1.	10-10-91	18-01-92	09-11-91	26-02-92
2.	13-11-91	24-12-91	06-11-91	29-02-92
3.	21-11-91	01-12-91	11-11-91	25-02-92
4.	24-11-91	03-12-91	09-01-91	27-02-92
5.	27-11-91	92	10-11-91	27-02-92
6.	16-11-91	92	05-11-91	23-02-92
7.	17-11-91	02-03-92	25-11-91	
8.	20-11-91	04-03-92	28-12-91	07-01-92

9.

05-12-91

02-03-92

28-12-91

05-01-92

Q.1 Communication network:

	A.Dhaka	B.Chittagong	C.Khulna	D.Rajshahi
1.	2,4	2,3,	2,4	1,2,4
2.	3,5	2,4	4	2,4
3.	4,5	2,5	2,4	2,4
4.	2,5	2,5	4	4
5.	2	2,4	3,4	2
6.	2,3	2,4	2,4	2
7.	4	3,4	2	2
8.	2	2,4	2,3,4 2,4	
9.	2,5	2,4	2,3,4 3,4,5	

Note: 5= katcha road

Mode of transportation:

	A.Dhaka	B.Chittagong	C.Khulna	D.Rajshahi
1.	2,4,5	2,4,5,3	2,4,5	1,2,4,5
2.	3,5	2,4,5	5	2,4,5
3.	4,5	4,5	2,4	2,4,5
4.	4,5	2,4,5	4,5	5
5.	4,5	4,5	2,3,4,5	2,4
6.	3,5	2,4,5	4,5	2,4,5
7.	4,5	2,3,4,5	2,4,5	2,4,5
8.	2,4,5	2,4,5	1,3,4,5	2,4,5
9.	4,5	4,5	3,4,5	3,4,5

Q.2 Public health facility of the same nature within the close proximity

	A.Dhaka No Yes	B.Chittagong No Yes	C.Khulna No Yes No Yes	D.Rajshahi
1.	Bhakurta 3 miles	/	Aurria 5 Km	Bargalipur 4 miles
2.	RD in the same bld.	/	Kumari 5 miles	Rajapur 2 miles
3.	/	/	Padmaker 2 miles	Nashratpur 4 miles
4.	/	Meher RD 2 miles	Bahadurpur 2 miles	Osmanpur 4 miles
5.	/	Rajarkul 3 miles	Raipur 5 miles	Tara gange 6 miles
6.	/	/	/ Tetulbaria 5 mile	Chakla 6 mile
7.	/	/	/	Singra 5 miles
8.	/	/	Rd 1 mile	Naogola 3 mile
9.	/	/	/	RD adjacent to UFWC

Q.3 Construction principle:

1. All load bearing brick wall

	Construction material	Finishes
a. Floor	cement, concrete	patent stone floor finish
b. Roof	R.C.C slab	ext. lime terracing and interior white wash
c. Wall	10" and 5" brick wall	exposed brick or plaster and white wash finish
d. Door	Wood shutter, ms/ wooden frame	enamel paint
e. Window	ms grill, ms/wooden frame, wooden shutter or part glazed.	enamel paint

Present Condition:

	a. Floor	b. Roof	c. Wall	d. Door	e. Window
A. DHAKA					
1	B	B	C	B	B
2	B	B	B	B	B
3	B	C	B	D	D
4	B	C	B	B	B
5	B	A	C	C	C
6	B	B	B	B	B
7	B	B	B	D	D
8	C	C	B	C	C
9	B	B	B	C	C
B. CHITTAGONG					
1	B	B	B	B	B
2	B	B	B	B	B
3	B	C	B	B	B
4	C	C	B	B	B
5	B	D	C	C	B
6	B	B	B	B	B
7	B	B	B	D	D
8	B	B	B	B	B
9	B	B	B	B	D
C. KHULNA					
1	A	A	A	A	A
2	B	B	B	D	B
3	B	B	B	B	B
4	D	B	D	B	B
5	B	B	B	B	B
6	A	A	A	A	A
7	C	C	C	C	C
8	B	B	B	D	D
9	B	B	B	D	D
D. RAJSHAHI					
1	B	B	B	B	B
2	B	B	B	B	B
3	B	B	B	B	B
4	D	A	A	A	A
5	C	C	C	C	C

6	B	B	C	C	C
7	A	A	A	A	A
8	C	C	B	C	C
9	C	B	C	C	B

Q.4 Water supply:

- Source: All centres are provided with a tube-well, two for staff quarters. Tube-wells are not working: 14 centres, cause: lack of maintenance and pilferage of parts.
- Collection procedure: hand pumped, collected in bucket.
- Filtering procedure: no such filtering procedure.
- Capacity: no record available
- Storage: no such storage facility.

Q.5 Drainage and disposal

Type Procedure

Rain water: no specific system, ground slope and outside ditches help to drain rain water

Night soil and other waste: septic tank and soak-well

Q.6 Electricity:

No electric supply, haricane (Kerosine lamp) is the alternative way.

Q.7 Number of population and area of influence:

7.a Number of population:

Serial No	A.Dhaka	B.Chittagong	C.Khulna	D.Rajshahi
1	22770	25000	16991	24000
2	50000	12000	14000	30000
3	16000	11000	20000	14800
4	29581	35000	18250	22500
5	25076	11000	16500	19711
6	-	-	22600	12000
7	15000	22000	-	10000
8	45000	24000	25000	-
9	26000	15000	30000	-

Note: - = data not available

7.b Area of influence: whole area, sometimes nearby areas.

Q.8.a. Total number of out-patient clinic: Two.

- One for general out-patient run by MA
 - One for MCH, Under-five and F.P. cases
- Where there were no MA/FWV, one clinic serves all patients.

8.b Total number of beds: Two for recovery (day time use only)

Q.9 Working hour: 6 days a week - 9 am to 4 pm

Patient consultation: 9 to 2 pm

Rest: One hour (2 pm to 3 pm)
Office work: 1 hour
Field work: FWV - 2 days/ week
MA - 2 days/ week

Q.10 Staffing pattern: see text, Table. 5-11

Category of Staff	M/F	Qualification	F.T/P.T.	Duties
Medical Assistant	M	3 years course	F.T.	In-charge of UHFWC attend general O.P. and emergency patient, field visit, record keeping.
F.W.V.	F	18 months course	"	attend MCH, Under 5, F.P. clinic, field visit, nutritional supp.
Pharmacist	M	Paramedic 3 years	"	overall responsibility of the dispensary, store-keeping
Family Welfare Workers	both	S.S.C		Field works, meeting
Aya	F	No specific training		cleaning, assisting FWV, directing patients
Peon/Guard	M	"		same as aya, assisting MA in field work

Q.11 Number of patients: see text, Table: 5-12

Q.12 Services delivered from the unit: see text Table 5-10

Q.13 What are the main health problems of the union:

Preventive: Immunisation, Nutrition, MCH care.

Promotive: MCH and Under-five

Curative: Fever, Cold, Dysentery, Diarrhoea, Skin, Worm, Influenza, Whooping cough, Malnutrition, Ear, Eye, Poisoning.

Q.14 Does the community participate in the health care delivery and how?

- Only through monthly meeting with the Union Chairman, members of Union Parisad
- No direct co-operation by means.

Q.15 Patient and staff arrive at the clinic

	Patient	Staff
a. on foot	/	/
b. public/private transport	/	/
c. in a wheel chair	x	x
d. other		
Boat (in rainy season, in a no. of UHFWC)	/	/

Q.16 Patient accompanied by

- a. children /
- b. other friends and relatives /
- c. staff

- Q.17 Patients received and directed by
a. receptionist x
b. clerk x
c. other staff: peon / aya/ pharmacist
- Q.18 Mode of contact for first and subsequent visit
- | | First | Subsequent |
|-------------------------------|-------|------------|
| a. direct access | / | / |
| b. appointment | x | x |
| c. referred by lower facility | x | x |
| d. other specify | | |
- Q.19 Referral of patients: procedure/ where to (including emergency cases)
by field workers to UHFWC
by MA and FWV to UHC/DH
verbally
- Q.20 Registration procedure
a. clerk/ recept. make note for first/ subsequent visit x
b. other specify: MA/ FWV register and keep record in respective clinics.
- Q.21 Services/Functions provided from reception/ waiting
- | | |
|--|--------------------|
| a. guidance to waiting, toilet, source of drinking water | / self |
| b. any query | / peon/aya |
| c. receive specimen | / rare |
| d. receive emergency patients | / |
| e. patient call from waiting to C/E, treatment etc | / direct as needed |
| f. supervision of main entrance, waiting | / peon/aya |
| g. record keeping | x |
| e. health education | / |
| f. other a. immunisation | x |
- Q.22 Waiting area
- | | |
|---------------------------|--|
| a. centralised | / |
| b. decentralised | x |
| c. male/female separation | x |
| d. other | two small sub-wait in front of the door in the corridor for F.P. clinic and treatment. |
- Q.23 Sanitary facilities (number, male, female, type)
For patient: one
For staff : one
Drinking water: tube-well
- Q.24 Patient call system
- | | |
|---------------------------|---|
| a. First come first serve | / |
| b. Use of number cards | x |
| c. Other method | x |
- Q.25 Record handling procedure:
- Types of records: name, address, age, weight, problem, treatment
 - Centralised / Decentralised x. For one month individually maintained.
 - Prepared by MA, FWV at respective clinics.
 - Collected by MA, FWV and sent to store.
- Q.26 Activities associated with C/E of general O.P. M.C.H., F.P. and under five.
- | | | | | |
|-------------------------|---|---|---|---|
| a. history taking | / | x | / | x |
| b. physical examination | / | x | / | x |

c. weighing	/	x	/	x
d. simple pathological investigation	/	x	/	x
e. prescription of drugs	/	x	/	x
f. immunisation	/	x	/	x
g. referral to higher level	/	x	/	x
h. storage of medicine, vaccine etc.	/	x	/	x
i. consultation with visiting doctor	/	x	/	x
j. data collection, compilation	/	x	/	x
k. preventive and promotive services, health education	/	x	/	x
l. treatment	/	x	/	x
m. dispensing	/	x	/	x
n. other specify				

Q.27 Laboratory test: only in 17½ centres, urine test for MCH and F.P. cases.

- a. done by: FWV
- b. specimen collected at FWV's room.
- c. test done: at FWV's room.
- d. test referred: to UHC by MA and FWV.

Q.28 Treatment

- a. centralised / decentralised x
- b. done by: MA, pharmacist at Treatment room.
- c. procedure: receive in central wait with other out-patient, treatment in treatment room by MA, pharmacist or referred to UHC verbally.

Q.29 Family Planning: Operation and Recovery- in 42½ clinics.

- a. Time table: no fixed time table
- b. Staff: FWV, MA. In a number of units a team consisting of MO-MCH, FWV comes from UHC once/month.
- c. Procedure: in treatment room by FWV, MA and the team from UHC
- d. Number of beds for recovery: Two.

Q.30 Dispensing:

- a. centralise / decentralised x
- b. male/ female separation x
- c. done by pharmacist, in his absence MA, FWV.
- d. timing: Clinic hour.

Q.31 Health Education:

- a. For all patients on one day/ week
- b. by MA and FWV
- c. Timing: not fixed, depends on number present at that day
- d. location: waiting room

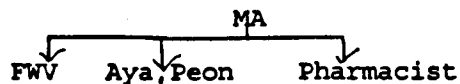
Q.32 Teaching and training:

- a. for T.B.A.
- b. by F.W.V.
- c. timing once/ month
- d. location: waiting area

Q.33 Equipment sterilisation:

- a. item for sterilisation: equipment, gloves, items needed for F.P. operations, check-up.
- b. procedure: using steriliser on stove.
- c. location for each stage: sterilisation in treatment room or FWV's room, cleaning from out side tube well.

- Q.34 Supply: item, source, received by and where, frequency**
- Drugs: medical supply from FWV's office (UHC), in kits; drugs and diet supplements 2-4 times per year.
 - Equipment: "", in kits.
 - Linen: ""
 - Other specify: vaccine, F.P. items and incentives, stationeries.
- Q.35 Storage and distribution:**
- centralised: in dispensary
 - by: pharmacist, in his absence MA/ FWV
 - procedure: received, checked, distributed, maintaining records; balance of supply at the end of each month.
- Q.36 Disposal of used item:**
- Done by: peon
 - Method: At one corner of the site, treatment room disposal burn or buried under ground.
- Q.37 Staff amenities: housing**
- Q.38 Laundry:**
- collected by aya/peon from rooms. Frequency depends on requirements
 - washing (where/ method) in outside laundry or inside the premise
 - storage: in store.
 - delivered by peon/aya to store.
- Q.39 Cleaning and maintenance, gardening, portering**
- by aya/ peon (2 times/day)
 - timing: early morning and at 4 pm.
maintenance: irregular
- Q.40 Management structure:**



- Q.41 Supervision of staff: Frequency/ method/ manner**
MO and FPO from UHC, DD MO (MCH), UFPO
- Q.42 What outreach services are provided from the unit and how**
Satellite clinic (8 houses, 1 to 2 villages may have 1 clinic)
2 times/ week by MA and FWV, field staff.
- Q.43 What support and services are received from UHC and how**
visit made by UHFPO, MO (MCH), supply of drugs, vaccine etc.
F.P. team for monthly sterilisation.

A-3.1 Variation in Catchment Area and Population

REGION (FORMER DISTRICT)	UPAZILLA	UNION (RURAL)	TOTAL AREA	POPULATION (000) 1981	POPULATION DENSITY IN (SQ.MILE)
CHITTAGONG DIV	122	1208			
Bandarban	7	28	1738	171	
Chittagong	21	252	2879	580	1907
Chittagong H.T.	18	80	3351	5491	148
Comilla	26	357	2549	6881	2701
Noakhali	15	172	2108	3816	1810
Sylhet	35	319	4911	5656	1152
DHAKA DIV.	119	1223			
Dhaka	34	368	2884	10014	3472
Faridpur	27	309	2657	4764	1793
Jamalpur	12	110	1293	2452	1896
Mymensingh	35	337	3733	6568	1760
Tangail	11	99	1314	2444	1860
KHULNA DIV.	96	882			
Barisal	27	224	2818	4667	1656
Jessore	21	232	2538	4020	1584
Khulna	25	219	4698	4329	922
Kushtia	12	107	1328	2292	1726
Patuakhali	11	100	1581	1843	1166
RAJSHAHI DIV.	123	1088			
Bogra	16	193	1501	2728	1817
Dinajpur	23	139	2535	3200	1262
Pabna	18	339	1827	3424	1874
Rajshahi	31	266	3651	5270	1443
Rangpur	35	151	3705	6510	1757
BANGLADESH	460	4401	55598	87120	1567

1989 Statistical Year Book of Bangladesh

A-3.2 Variation in number of facilities and terminology used

1. 1989 Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics:

Year	U.H.C	R.H.C	U.S.C	MCWC	Notes:
1976	151	12	1275	91	U.H.C.-Upazilla Health Complex
1977	179	12	1275	91	R.H.C- Rural Health Centre
1978	253	12	1275	91	U.S.C- Union Sub Centre
1979	275	12	1275	91	MCWC- Mother and Child Health Centre
1980	275	12	1275	93	Source: Director General of Health Service, Ministry of Health and population control.
1981	280	12	1275	93	page no. 550
1982	312	12	1275	96	
1983	319	12	1275	96	
1984	344	12	1275	96	
1985	346	12	1275	96	
1986	356	12	1275	96	
1987	356	12	1275	96	

Region wise distribution of health and family planning facilities 1986-87

Region Former District/ Division	Upazila Health Complex	Dispensary	F.W.C.
Bandarban	3	1	4
Chittagong	19	85	40
Chittagong H.T.	14	11	17
Comilla	19	90	69
Noakhali	11	56	54
Sylhet	28	77	46
CHITTAGONG DIVISION	94	320	230
Dhaka	24	115	100
Faridpur	20	95	46
Jamalpur	8	35	33
Mymensing	29	88	50
Tangail	9	54	54
DHAKA DIVISION	90	387	283
Barisal	21	46	36
Jessore	16	49	70
Khulna	19	29	29
Kushtia	9	48	29
Patuakhali	7	20	16
KHULNA DIVISION	72	192	180
Bogra	12	62	71
Dinajpur	19	53	30
Pabna	15	36	59
Rajshahi	27	105	47
Rangpur	25	124	85
RAJSHAHI DIVISION	98	380	292
BANGLADESH	354	1279	985

Source: Ministry of Health and Population Control
FWC - Family Welfare Centre.

2. Bangladesh Health Service Report 1985

Director General of Health Services. Government of the Peoples
Republic of Bangladesh.

- a. Scheme for Rural Health Centre started in 1961 and 150 of such centres were set up before 1971. The Thana Health Complex (now UHC) scheme was approved in 1967 to establish a 31 bed hospital in each rural upazila. (page.3)
- b. At the union level, there are Health and Family Welfare Centres/ sub-centres in about 2200 locations. (p. 3)
- c. At present there are 2200 HFWCs functioning at the union level as against the total target of 4,500. At the Upazila level there are 344 health complexes functioning with 31 beds each as against 397 rural upazila.
- d. Annexure-8: List of 397 Upazila Health Complexes.
- | | |
|------------|---|
| 31 bed UHC | number of unit sanctioned: 397 |
| | number of unit functioning: 297 (with 31 bed) |
| | 64 only OPD |
| | 25 below 31 |
| | (5 to 25) |
| | 3 38 bed |

3. Proposed Programme for ' The Health and Family Planning Sector in the 4th Five Year Plan 1990-95', Ministry of Health & Family Planning Gov. of Peoples Republic of Bangladesh

Table 2.2: Major Health Indicators and targets of the Fourth Five Year Plan (1990-95)

Health Indicator	Unit	1984-85 (Actual)	1989 (Benchmark)	1995 (Tentative target)
Upazila Health Complex	one in each union	341	351	397
UHFWC and RD	one each union	2329	3700	4325

4. The Fourth Five Year Plan 1990-95
Planning Commission. Ministry of Planning, Government of the
Peoples Republic of Bangladesh, Dhaka . June 1990.
- a. There are at present 2100 UHFWC functioning. In addition to
that there are another 1275 Rd's under Health Division
which will be transferred to the Population F.P. Division for
upgradation to UHFWC.

APPENDIX 4-1

Recommendations of Arora and Bindra (1977) for the provision of toilet fixtures in hospitals.

<i>Fixtures for</i>	<i>Indoor Patient Wards</i>
<i>Hospitals</i>	<i>For Males and Females</i>
Water closets	1 for every 8 beds or part thereof.
Ablution taps	1 in each water-closet. Plus one water tap with draining arrangements in the vicinity of water closets and urinals for every 50 beds or part thereof.
Wash basins	2 up to 30 beds; add 1 for every additional 30 beds or part thereof.
Baths	1 bath with shower for every 8 beds or part thereof.
Bed pan washing sinks	1 for each ward
Cleaner's sink	1 for each ward
Kitchen sinks and dish washers (where kitchen is provided)	1 for each ward
	<i>Outdoor Patient Wards</i>
<i>Fixtures</i>	<i>For Males</i> <i>For Females</i>
Water closets	1 for every 100 persons or part thereof 2 for every 100 persons or part thereof
Ablution taps	1 in each water-closet. 1 water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water-closets and urinals. 1 in each water closet
Urinals	1 for every 50 persons or part thereof. —
Wash basins	1 for every 100 persons or part thereof 1 for every 100 persons or part thereof

Number of Consultation / Examination room :

Average population of catchment area	20,000 inhabitants
Average number of visits per year	3.5 visits
% of first visits	20%
% of subsequent visits	80%
Average time for first consultation	8 minutes
Average time for subsequent consultations	4 "
Number of working days in the year	300 days
Hours of work per day of consulting room	6 hours
Total number of visits per year (20,000 x 3.5)	70,000 patient/yr
Average number of visits daily 70,000 / 300	233 patients/day
Number of first consultation	$233 \times 20\% = 46$ "
Number of subsequent consultations	$233 \times 80\% = 187$ "
Total time for first consultation	$46 \times 8 = 368$ minutes
Total time or subsequent consultations	$187 \times 4 = 748$ "
Total time for all patients	1116 minute / day
Since $1116 / 360 = 3.1$, a minimum of 3 consulting rooms are required for the health centre.	

(* while in calculating consultation time allowance should be given to the referral of patients within the same health centre i.e. from FWV to MA or from MA to visiting doctor)

Alternative way of calculating patient attendance :

Number of working days : (365 minus weekends, leave , sickness and days for training and refresher courses)

For visiting doctor (fortnightly) 25 days
For paramedicals (MA,FWV,A.N.) 280 days each

The number of working days of the health centre itself can be 300 days.

Average number of patients examined and treated per day by the doctor is assumed to be 60 and by paramedicals to be 80.

Total number of patients per annum in contact with the doctor
(26×60) = 1560
Total number of patients per year in contact with the paramedics
($3 \times 80 \times 280$) = 67200
Total number of patients per year that can be seen = 68760
(approx. 70,000)
Total number of patients per day = 233

20,000 may include 4,000 children under five. The under five visiting 10 times a year will give 40,000 visits. This leaves around 30,000 visits from the remaining 16000 people , that is to say 2 visits per annum average .

Thus the health centre would serve a catchment population of 20,000 with a daily attendance of 233 patients.

Daily attendance of under 5/ pre school age children 133
" " " expectant and lactating mothers 23(10%)
" " " general out patients A5-2 77

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