

NO. 1

**BASIC DESIGN STUDY REPORT
ON
THE PROVINCIAL HOSPITALS REDEVELOPMENT PROJECT
IN
PAPUA NEW GUINEA**

MARCH 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

GRF

90-29

JICA LIBRARY



1080990131

20921

**BASIC DESIGN STUDY REPORT
ON
THE PROVINCIAL HOSPITALS REDEVELOPMENT PROJECT
IN
PAPUA NEW GUINEA**

MARCH 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団

20921

PREFACE

In response to the request of the Government of Papua New Guinea, the Government of Japan has decided to conduct a Basic Design Study on the Provincial Hospitals Redevelopment Project and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent to Papua New Guinea a study team headed by Dr. Toshihiko Hasegawa, Deputy Director, Planning Division, Health Policy Bureau, Ministry of Health and Welfare from August 26 to October 4, 1989.

The team exchanged views with the officials concerned of the Government of Papua New Guinea and conducted field surveys. After the team returned to Japan, further studies were made. Then, a mission was sent to Papua New Guinea in order to discuss a draft report and the present report was prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Papua New Guinea for their close cooperation extended to the team.

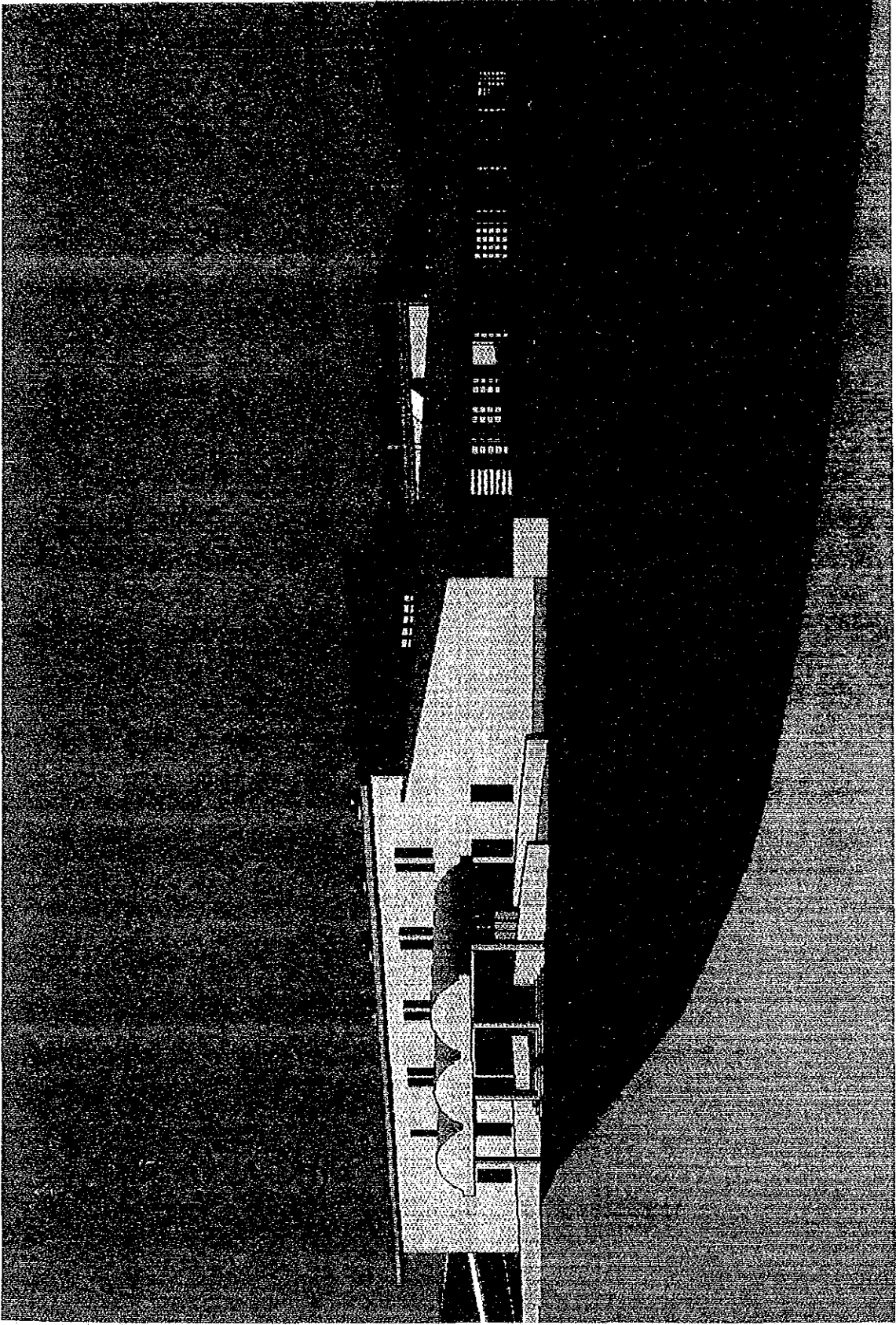
March 1990



Kensuke Yanagiya

President

Japan International Cooperation Agency

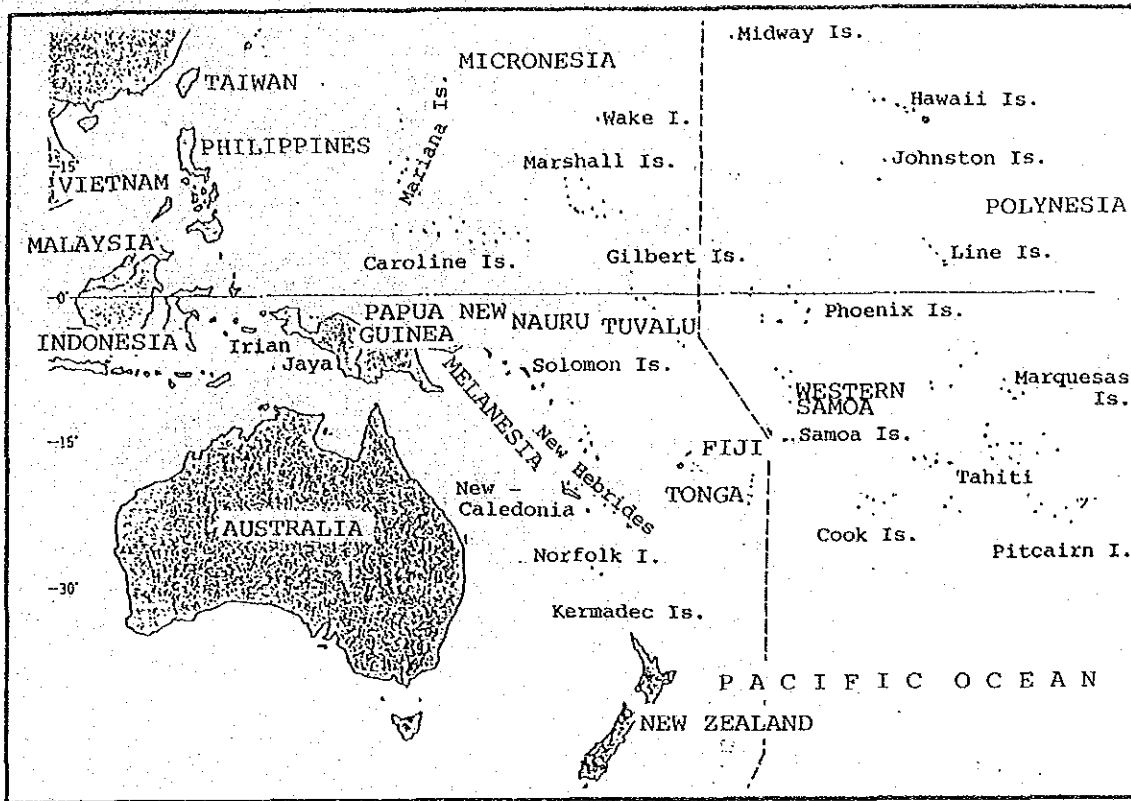


Perspective View of Lae (Angau Memorial) Hospital

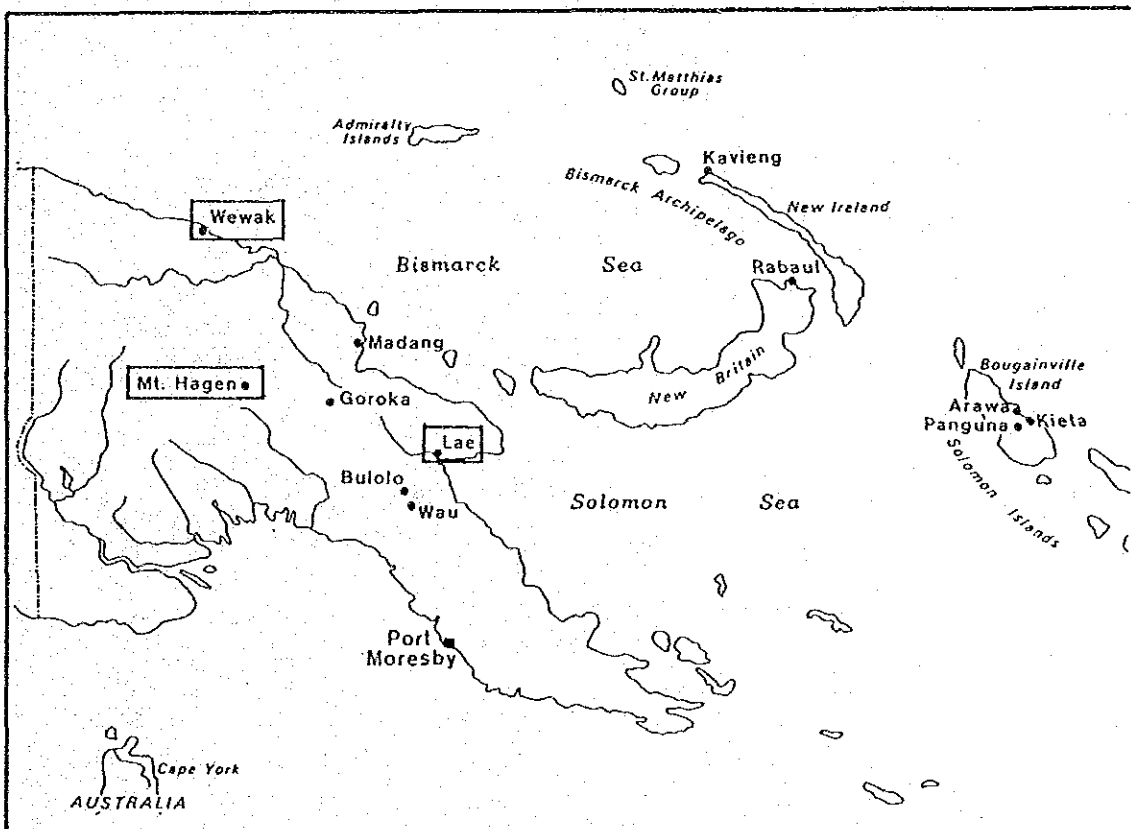


Perspective View of Mt. Hagen Hospital

PAPUA NEW GUINEA



PROJECT LOCATIONS



SUMMARY

SUMMARY

Papua New Guinea (PNG) is situated at the west end of the South Pacific Ocean, and consists of the eastern half of the main island of New Guinea and approximately 600 islands. The country declared independence in 1975. The gross population is estimated to be around 3,661,000 as of the year 1989.

The disease patterns of the country in 1987 were governed by four diseases: pneumonia, malaria, dermatopathy and subcutaneous diseases, and epidemic diarrhea, which accounted for 33.7% of all major disease cases including delivery-related treatments. Major cause of death in 1987 were six diseases: pneumonia, perinatal deaths, epidemic diarrhea, dermatopathy and subcutaneous diseases, malaria, and tuberculosis, which accounted for 54.3% of all major diseases.

The Government programmes of health services in PNG have been ordered into effect to promote primary health care services preferentially in accordance with the First National Health Plan (1974/78) announced in 1974. The number of health centres, health-subcentres, and aid posts has been increased throughout the country since the execution of the Plan. As the result, the indicators of the health statistics were upgraded greatly and the average life expectancy rose to 49.6 from 40.4 for the decade before 1980. In 1985 it has become possible for 96% of the population to have access to health care facilities within two hours. However, the patterns of major diseases remained unchanged, and are still governed with infectious diseases such as epidemic diarrhea, malaria, respiratory diseases, and STD. The numbers of normal and abnormal deliveries tend to rise in accordance with the increase of births in hospitals, and the number of child outpatients is also being increased in accordance with the policy to strengthen infantile health services.

The Government of PNG established the Second National Health Plan (1986/90) which was considered to be a core of the social services sector in the National Development Plan. The Second National Health

Plan has been established in the intention of strengthening secondary health services at various provincial and referral hospitals to support the network of primary health services by upgrading them in accordance with the intention of the First National Health Plan. Meanwhile, most of the existing provincial hospitals in the rural areas were built in 1950's and 1960's, have exceeded their useful service life, and in addition are suffering from crowding by both inpatients and outpatients. If these facilities are left aside as existing, the facilities, equipment and infrastructure will result in degeneration of the whole health services in the country.

In view of the situations stated above, the Department of Health launched an important policy to upgrade the national health services. In 1986 the Department conducted a field survey in collaboration with Australian Government, and issued the report of the "Hospital Development Plan" in which a master plan was prepared for strengthening health services of provincial hospitals. Succeeding to the above report, the Department prepared in 1987, in cooperation with the Asian Development Bank, the redevelopment master plan for those provincial hospitals which were given higher priority in the "Hospital Services Project."

In accordance with the requests from the Government of PNG based on the survey reports stated above, various items of medical equipment were furnished in 1987 under the grant aid from the Government of Japan to equip various hospitals in the country. Succeeding to the above aid, the medical grant aid from Japan for the Redevelopment Plan of Port Moresby General Hospital, 1988/89 is presently being implemented.

Consecutively the Government of PNG selected nine provincial hospitals (at Mt. Hagen, Kundiawa, Wabag, Lae, Madang, Wewak, Korema, Daru, and Vanimo) requiring redevelopment urgently. The Government of PNG requested the grant aid to the Government of Japan for redevelopment plans to augment the functions of these provincial hospitals. Three provincial hospitals which have high priority, Lae (Angau Memorial) Hospital deemed as a typical national base hospital, Mt. Hagen

Hospital as a typical provincial base hospital in an area of rapid growth of population, and Wewak Hospital as a provincial hospital in a rural area.

The Government of Japan decided implementation of the basic design study plans for the redevelopment of three provincial hospitals which have higher priority, namely Lae, Mt. Hagen, and Wewak, in response to the requests from the Government of PNG. The Japan International Cooperation Agency (JICA) dispatched the basic design study team to PNG from August 26 to October 4, 1989, and conducted the surveys on the background and contents of the plans, the existing conditions of three provincial hospitals, operational organisations, budgetary measures, and proposed sites of construction. The study team prepared a draft of final report upon the return to Japan through further studies. The Japan International Cooperation Agency sent to PNG a mission to explain and discuss on the draft of final report from February 7 to 16, 1990.

The health services in PNG are controlled and administered under the responsibility of the Department of Health. In line with the decentralisation policy of the central government, the Department of Health prepares national health plans and provides technical assistance and advice to the health service facilities administered by provincial governments. The health services in the regions are controlled and administered by the provincial governments.

Health service facilities are organised like a pyramid placing Port Moresby General Hospital (PMGH) as a national referral hospital at its apex and a secondary health service facility, including national base hospitals, provincial base hospitals, and provincial hospitals. There are health centres, health-subcentres, and aid posts as a primary health service facility at the lower levels.

To review the redevelopment proposed by the Government of PNG, field surveys were conducted to investigate the present status of health services, actual management and administration, proposed sites of construction, social infrastructure, local construction industries,

and maintenance services on present equipment. In addition to the above, all the project hospitals were physically investigated. As a result of analyses of the survey data collected, the optimum facilities and size for each project hospital have been determined as described herein.

Plans for new facilities have been prepared stressing facility design for efficient running health service activities. Also, the plans have been prepared to provide ease of maintenance with the intention that future maintenance costs will not increase from that at present and that efficiency will be improved. Since the new facilities will be integrated with the existing facilities, functional coordination and provisions for smooth operation of the existing hospitals during construction have been seriously considered. Future expansion plans have also been taken into account for the hospitals at Lae and Mt. Hagen, and functional coordination and provision for future expansion at these hospitals have been fully incorporated in the new plans.

Provision of medical equipment has been planned to supply only fixed and mobile equipment which are minimum necessary for the new facilities, in consideration of continuous operations of the hospitals and deterioration of the existing equipment.

The outlined features of three provincial hospitals, problems, and synopsis of the redevelopment plans are roughly stated below:

1) Lae (Angau Memorial) Hospital (National Base Hospital)

This hospital was built immediately after World War II as a general hospital at Lae City, the second largest city in PNG along the northern shore of the main island. The hospital provides health services to a population of approximately 385,000 as of 1989 in the province of Morobe. The hospital has the only cancer centre and artificial limbs fabrication factory in PNG, acts as a leading secondary health service facility in the province of Morobe, and plays an important role in the health services of the country.

The hospital was equipped with 528 beds with an assignment of 26 doctors (including dentists), 289 nursing staff, 21 medical technicians, and 194 administrative staff in 1988. The number of adult outpatients reached 192,778, and inpatients 12,293 in 1988. Drastic expansion or alterations have not been provided since the original construction in 1963, except for the new children outpatient building which was completed in 1988 to meet the increased demand. The facilities are totally deteriorated due to age. Smooth operation of the entire hospital including outpatient department, obstetric ward, and operating theatre is sometimes prevented due to the restricted spaces.

The optimum contents and sizes of new facilities have been established as described below in accordance with basic principle of the survey stated previously:

- Proposed Site of Construction

New Central Building: To be located at the south side of New Children Outpatient Building in the compound of Lae Hospital
Connecting Passage: To be located between the existing Operating Theatre and Obstetric Ward

- Floor Area

New Central Building	4,795 m ²
Connecting Passage	10 m ²
Total Floor Area	4,805 m ²

- Structure and Number of Stories

New Central Building: Two storied reinforced concrete
Connecting Passage: Single storied wooden

- Contents of Facilities

New Central Building

Outpatient Departments

General Outpatient Department, Emergency Department,

Specialist Outpatient Clinics, and Dispensary

Examination Laboratory and Operation Department

X-ray, Pathology Laboratory, and Operating Theatre
Other Departments
Part of Administrative Department, On-Call Staff Room
Building Machine Room, Affiliated Rooms, and peripheral
roads
Connecting Passage: Passage corridor

- Major Medical Equipment

New Central Building

Outpatient Departments

General Outpatient Department: Diagnosis and
treatment sets

Emergency Department: Minor operating sets
(operating table, shadowless light, anaesthetic
instrument) and instrument for Emergency

Specialist Outpatient Clinics: ENT treatment unit and
ophthalmology treatment unit

Dispensary: Dispensing table

Examination Laboratory and Operating Department

X-ray: Radiograph equipment and automatic film
development unit

Pathology Laboratory: Examination tables

Operating Theatres: Operating sets (operating tables,
shadowless lights, and anaesthetic instruments)

The existing outpatient department and its functions of the hospital will be greatly upgraded and intensified upon completion of this project. However, the new facilities may be operated and administered with the staff equivalent to the present number for the time being, as the beds are not being increased and the medical staff of the outpatient departments are not being increased. It is also planned to minimise the operation and maintenance costs of the facilities by providing optimum design of architecture, mechanical and electrical systems, and adequate construction materials.

Alterations and strengthening of existing outpatient department and inpatient wards, outside of the scope of this project, may be performed in the future without interrupting the other facilities upon execution of this project.

This project will result in strengthening primary health services offered by this hospital, and in upgrading secondary health services of the largest hospital in the northern coast of the main island of PNG.

2) Mt. Hagen Hospital (Provincial Base Hospital)

This hospital is located in the capital city of Mt. Hagen in the province of Western Highlands in the highland area of rapid growth of population. The hospital was constructed in 1956 as a health centre, and was reconstructed in 1965 as a standard hospital. The hospital provides health services to the population in the province of Western Highlands of approximately 306,500 in 1987. The present number of beds is 263. The number of staff in 1988 was 14 doctors, 338 nursing staff, and 69 administrative staff. The number of outpatients (adults and children) reached 191,597 in 1988 and inpatients numbered 15,350.

As stated above, small extensions have been repeated as the demand increased since its construction in 1965. The result is restricted spaces and lack of available spaces. The hospital is short of beds, and departments such as the examination laboratory, outpatients, and dispensary are suffering from limited spaces and are disorderly. There exists danger of the intermixing of infectious patients due to a shortage of beds, and from the crowded waiting lines and confused passage lines of patients not separated from each other and preventing the smooth operation of the whole hospital.

The optimum contents and sizes of new facilities have been established as described below in accordance with same basic principle to Lae Hospital:

- Proposed Site of Construction
 - New Maternity and Child (MCH) Ward: To be located at the site where existing buildings have been demolished within the area of Mt. Hagen Hospital
 - New OPD Building: To be located in the open space at the south side of existing Outpatient Department in Mt. Hagen Hospital

- Floor Area

New MCH Ward	2,767 m ²
New OPD Building	684 m ²
Total Floor Area	3,451 m ²

- Structure and Number of Stories

- New MCH Ward: Reinforced concrete, two and single storied with semi-basement building machine room
- New OPD Building: Reinforced concrete, two storied with partially flat building

- Contents of Facilities

- New MCH Ward: Provided with child patient ward, obstetrics ward, delivery room, special care nursery, ICU, X-ray examination room, and affiliated rooms
- New OPD Building: Provided with pathology examination laboratory, dispensary, specialist clinics, on-call staff room, and affiliated rooms

- Major Medical Equipment

- New MCH Ward: Beds, obstetrics instruments (including delivery instruments), neonate and paediatric instruments, and X-ray equipment
- New OPD Building: Examination tables

The existing wards, delivery room, neonate treatment in the MCH Department, pathology laboratory, dispensary and specialist clinics in the OPD Building will be greatly upgraded and intensified by eliminating confusion in the existing building upon

implementation of this project.

This project will also relieve the shortage of beds by providing new wards having approximately 150 beds. These will be in the New MCH Ward to be constructed at the site of the old psychiatric and intermediate wards, having about 40 beds, which are to be demolished. The New MCH Ward upgraded with increased beds and the OPD Building upgraded with additional space and a more efficient layout, may be operated and administered with the present staff without additional nursing staff, except for the wards allocated to new purposes. It is also planned to minimise the operation and maintenance costs of the facilities by providing optimum design of architecture, mechanical and electrical systems, and adequate construction materials.

This project will provide means to greatly improve the services provided by the maternity and children departments of the hospital, in addition, by providing additional beds it will benefit the overall administration of the hospital. The additional space provided and the revised layout will improve the passage flow of patients and reduce congestion in the passage ways. New construction can be performed without interrupting the operation and administration of the existing hospital, except for the demolition of the small and oldest building of the psychiatric and intermediate wards.

This project will result in strengthening primary health services of this hospital, and in upgrading secondary health services of the hospital suffering from the shortage of beds and deterioration, located in a densely populated area in the province of Western Highlands.

3) Wewak Hospital (Provincial Level One Hospital)

This hospital is located at the capital city in the province of East Sepik. The hospital provides health services to the population of 383,200 from two provinces of East Sepik and West Sepik.

The hospital has 358 beds with support of 6 doctors, 139 nursing staff, five medical technicians, and 11 administrative staff. In 1988 the total number of adult outpatients was 84,470, births 1,601, surgical operations performed 6,112 and prescriptions filled 15,186.

Original layout and size of this hospital has not changed since its construction in 1962 with the exception of minor extensions. The hospital, therefore, is not able to respond to the increased demand for health services, and is suffering from shortage of spaces. The adult outpatient department, dispensary, and operating theatres are restricted, and there is a shortage of special care nursery, deteriorated interiors within the psychiatric and physiotherapy wards, and obstructions to a smooth performance of services.

The optimum contents and sizes of new facilities have been established as described below in accordance with the same basic principle to apply for Lae. A plan of temporary movement of some units has been prepared by the hospital to continually maintain its functions throughout the construction.

- Proposed Site of Construction: Within the same site of existing hospital
- Floor Area for Alternations: 693 m² (including extension of 207 m²)
- Structure and Number of Stories: Flat wooden
- Contents of Facilities
Extension: Outpatient Department, Dispensary, Pathology Laboratory, and Operating Theatres' affiliated rooms
Alteration: Special Care Nursery, Physiotherapy Ward, and Psychiatric Ward
- Major Equipment: X-ray equipment, physiotherapy equipment, special care nursery equipment, and emergency treatment

equipment

The existing functions of the Outpatients Department, Pathology Laboratory, Operating Department, Special Care Nursery, and some wards will be greatly upgraded by eliminating obstruction resulted from the restricted spaces upon completion of this project. The increase in floor area will not raise health staff or maintenance costs as they will be offset by improved efficiency.

This project will result in resolving the immediate problems of deterioration and shortage of spaces and in strengthening primary health services through the services of the hospital, as a core hospital in the provinces of East Sepik and West Sepik.

Estimated time necessary for implementation of the redevelopment project for the three provincial hospitals based on the grant aid from the Government of Japan is as listed below:

HOSPITAL	ESTIMATED COMPLETION DAYS	
	DETAILED DESIGN	CONSTRUCTION
Lae (Angau Memorial) Hospital	3 months	12 months
Mt. Hagen Hospital	3 months	12 months
Wewak Hospital	3 months	4 months

The executing organisations of this project in PNG are as follows: The Department of Health (DOH) will be responsible for implementation of the project. The Department of Finance and Planning (DOFP) will be responsible for coordination of the project. The Department of Works (DOW) will be responsible for the matters of construction.

Major bottlenecks in three existing hospitals will be removed and the health services will be much improved upon execution of this redevelopment plan. The existing functions of three hospitals will also be upgraded by eliminating the bottlenecks. Prospective redevelopment plans are also suggested in this report assuming this redevelopment plan is approved and executed.

Future execution of the prospective plans suggested by this report can be accomplished without interference to ongoing activities and the work of this redevelopment plan will provide a basis for future improvements.

Secondary health services in the rural areas of the country will be greatly upgraded with updated health services integrated into the New Central Building at Lae Hospital, with increase of beds in the whole hospital in accordance with construction of new buildings for MCH Ward and OPD at Mt. Hagen Hospital by eliminating bottlenecks. The implementation of the proposed redevelopment plan for the three provincial hospitals will therefore have a significant impact on the improvement of health services in PNG. The execution of the proposed redevelopment plan of the three provincial hospitals, therefore, will be proven considerably significant to the improvement policy of health services in PNG. The grant aid from the Government of Japan will be unquestionably justified.

The following suggestions are presented for implementation of this redevelopment plan and for smooth and effective operations of the facilities after completion:

- Establishment of a joint committee having the rights to discuss and determine matters concerning the implementation of the project consolidatedly for execution and coordination of the Redevelopment Plan by the government agencies concerned of PNG.
- Smooth and timely implementation of work to be performed by the Government of PNG.
- Protection of the existing health services at the three project hospitals, especially at Wewak Hospital, from interruptions during construction, and provisions of safety measures.

- Detailed study by the Government of PNG on operation and administration of each hospital after completion of the redevelopment plan, especially on funding for each hospital and recruiting nursing staff for Mt. Hagen Hospital with totally increased beds.

CONTENTS

	Page
PREFACE	
PERSPECTIVE VIEWS OF LAE (ANGAU MEMORIAL) HOSPITAL AND MT. HAGEN HOSPITAL	
MAPS	
SUMMARY	i
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 BACKGROUND OF THE PROJECT	5
2-1 OUTLINE OF PAPUA NEW GUINEA	5
2-1-1 Land and Population	5
2-1-2 National Economy	6
2-2 GENERAL SITUATION OF HEALTH SERVICES IN PNG	8
2-2-1 General Situation of Health Services	8
2-2-2 Disease Patterns and Types of Medical Treatment	28
2-2-3 Present Situations of Health Services Administration	34
2-2-4 Medical Education and Training	39
2-3 SYNOPSIS OF RELATED PROGRAMMES	45
2-3-1 National Development Plan	45
2-3-2 National Health Plan	47
2-3-3 International Cooperation in Sector of Medical Health Services	49
2-4 EXISTING CONDITIONS OF PROJECT HOSPITALS	50
2-4-1 Administration and Services	50
2-4-2 Existing Conditions of Medical Facilities and Equipment	61
2-5 CONTENTS AND CIRCUMSTANCES OF REQUESTS	78
2-5-1 Background of Requests for Project	78
2-5-2 Content of Requests for Project	79
CHAPTER 3 CONTENTS OF THE PROJECT	81
3-1 PURPOSES OF PROJECT	81
3-2 EXAMINATION OF CONTENTS OF REQUESTS	83
3-2-1 Examination of Scope of Project	83
3-2-2 Examination of Facilities and Equipment Requested	85
3-3 OUTLINE OF PROJECTS	100
3-3-1 Executing Organisations and Project Plans	100
3-3-2 Locations and Conditions of Project Sites	110
3-3-3 Outline of Proposed Facilities and Equipment	125
3-3-4 Maintenance and Operations	129

	Page
CHAPTER 4 BASIC DESIGN.....	137
4-1 BASIC DESIGN POLICY	137
4-2 STUDY AND EXAMINATION ON DESIGN CRITERION	140
4-2-1 Design Conditions for Facilities	140
4-2-2 Selection of Equipment	163
4-3 BASIC PLAN	164
4-3-1 Site and Layout Plan	164
4-3-2 Architectural Design	167
4-3-3 Structural Design	175
4-3-4 Building Equipment Plan	182
4-3-5 Building Material Plan	196
4-3-6 Exterior Site Plan	198
4-3-7 Medical Equipment Plan	199
4-3-8 Basic Design Drawing	209
4-4 PROJECT EXECUTION	277
4-4-1 Project Execution System	277
4-4-2 Scope of Work and Responsibilities	278
4-4-3 Execution Guidelines	281
4-4-4 Special Precautions	282
4-4-5 Construction and Supervision	283
4-4-6 Materials and Equipment Procurement Plan	285
4-4-7 Project Schedule	286
4-4-8 Estimated Project Cost (PNG)	289
CHAPTER 5 EVALUATION OF THE PROJECT AND CONCLUSION	291
5-1 BACKGROUND OF THE PROJECT	291
5-2 CONCLUSION	294
5-3 RECOMMENDATIONS	295
APPENDIX	
I MEMBERS OF THE BASIC DESIGN STUDY TEAM	301
II FIELD SURVEY SCHEDULE	303
III PERSONS INTERVIEWED	307
IV MINUTES OF DISCUSSIONS	310
V STATISTICAL DATA	321

CHAPTER 1
INTRODUCTION

CHAPTER 1 INTRODUCTION

Health care in Papua New Guinea is organised in a pyramid fashion with the Port Moresby General Hospital, serving as a national referral hospital, at the top. Below are base hospitals and provincial hospitals as secondary health service facilities. The primary health service facilities are the next level and include health centres, health-subcentres, urban clinics and aid posts.

To help achieve this goal the First National Health Plan 1974/78 was prepared by the government prior to the Independence of the country in 1975. The Government has adopted a policy to strengthen primary health care services in accordance with the Plan, and has worked to upgrade the existing health centres, health-subcentres, and aid posts.

As a result, average life expectancy rose from 40.3 to 49.6, and rates of both neonatal mortality and infant mortality were reduced by almost half for the decade before 1980.

These statistics show that the administration's policies were having a very positive impact. However, the pattern of major diseases has remained unchanged, with many patients still suffering from infectious diseases. All of this indicated that, while health care services had been expanded during the decade prior to 1980, they were still ineffective in improvement of national health and prevention of diseases with only decentralised basic health services.

For this reason the second National Health Plan 1986/90 was prepared.

It was also agreed that secondary health care facilities (hospitals) would be developed along the following guidelines:

- Operate hospitals within 45% of the gross annual health service budget.
- Provide efficient medical equipment and supplies at each hospital.

- Require hospitals to provide training for personnel manning the primary health care facility.

A major problem is that most provincial hospitals, the nucleus of the secondary health services, were built in the 1950's and 1960's and are obsolete and in poor condition. Negligence of these facilities could cause collapse of the whole health service system due to deterioration of buildings, equipment, supplies and infrastructure.

In 1986 the Department, with support from Australia, conducted a survey of provincial hospitals. This resulted in the report "Survey on Hospital Plan" in which master plans of improvements to provincial hospitals were recommended. Subsequent to this a master plan for redevelopment of various top priority provincial hospitals was prepared by the Department for "Hospital Services Project" under the sponsorship of the Asian Development Bank.

In accordance with the Master Plan, the Government of Papua New Guinea gave priorities to nine provincial hospitals. Of those nine hospitals, three hospitals, those of Lae, Mt. Hagen, and Wewak, were considered in need of immediate improvements because of the conditions described below:

- (1) **Lae National Base Hospital:** Subject hospital had been repaired several times in the past, prior to addition of the children outpatient building in 1988. Except the addition of the children outpatient, large-scaled building alterations have not been provided since its initial construction. The facilities are badly deteriorated due to age. Various departments, including outpatients, central supply, dispensary, and operating theatres are extremely overcrowded. Number of maternity and delivery beds is not sufficient and interferes with the smooth operation of the entire facility.
- (2) **Mt. Hagen Provincial Base Hospital:** Subject hospital was first built as a health centre at the present location in 1956. The centre was reconstructed as a base hospital in 1965, and partially

repaired or expanded later. The province of Western Highlands, where the hospital is situated, is in the centre of the highland area of the main island, and needs for health services have sharply risen due to a rapid population increase. Since substantial repairs or additions have never been provided, this hospital is in direct need of expansion out of the three hospitals.

Smooth and efficient running of the hospital is sometimes impaired because of bed shortage of maternity and child wards and space shortage of departments such as laboratory, X-ray, outpatients, dispensary, and central supply, shortage of maternity beds, and inadequate passage lines.

- (3) **Wewak Provincial Hospital:** Subject hospital has been partially expanded since the hospital was constructed in 1962. However, the original layout still remains. The hospital has difficulty meeting the increased needs of the increased population. Smooth running of the hospital is hampered by the restricted space available for outpatients, dispensary, and operating theatres, special care nursery, and the deteriorated interiors of psychiatry and physiotherapy wards.

In view of the overall situation as stated above, the Government of Papua New Guinea has prepared plans for the redevelopment of three hospitals at Lae, Mt. Hagen, and Wewak to support primary health services in their rural areas by upgrading functions and efficiency as a secondary health service facility, and by increasing number of beds at Mt. Hagen Hospital. A request was made to the Government of Japan for grant aid to implement these plans.

The Government of Japan decided to conduct the survey of the project for the grant aid in response to the request from the Government of Papua New Guinea. The Japan International Corporation Agency dispatched a Basic Design Study Team, headed by Dr. Toshihiko Hasegawa, Deputy Director, Planning Department, Health Policy Bureau, Ministry of Health and Welfare to Papua New Guinea for the

period from August 26 to October 4, 1989, to investigate the feasibility of the grant aid by analyses of the following:

- 1) Study the background of the plans and analysis of adequacy.
- 2) Situation of present health services in Papua New Guinea.
- 3) Priorities of the projects in the Second National Health Plan.
- 4) Discussions with the counterparts on scope of work for the planned redevelopment at three project hospitals.
- 5) Confirmation of project executing organisation, operations and maintenance organisation, and scope of work and responsibilities to be borne by the Government of Papua New Guinea.
- 6) Survey of three construction sites.
- 7) Survey of the existing facilities and medical equipment in the three hospitals.
- 8) Survey of existing operations and management systems of three hospitals.
- 9) Survey of situation of construction industries in the country.

This report has been prepared through the analyses of the above mentioned items in Japan and results of briefing and discussion which was conducted by a mission headed by Dr. Hasegawa in Papua New Guinea from February 7 to 16, 1990.

Annex, including minutes of discussions, the members of the survey team, and the field survey schedule, is attached at the end of this report.

CHAPTER 2

BACKGROUND OF THE PROJECT

CHAPTER 2 BACKGROUND OF THE PROJECT

2-1 OUTLINE OF PAPUA NEW GUINEA

2-1-1 Land and Population

(1) Land and Languages

Papua New Guinea (PNG) is situated at the west end of the South Pacific Ocean. The country consists of the eastern half of the main island of New Guinea and of approximately 600 small islands. The gross land area is approximately 464,000 square kilometres, situated between the 1st and 12th degrees of south latitude and between 141st and 160th degrees of east longitude. A range of high mountains rising to 4,500 metres above sea level runs through the centre of the main island, and its peripheral areas form highland valleys. Lower parts of the main island, those areas that are not mountainous and highland regions are within the tropics, as are the adjacent islands. Since the most of the land is either mountainous, swampy plains, or dense forests, only 15% of the land area is arable.

There are approximately 500 different tribes and over 700 languages are spoken in the country. Therefore, the English language is used for official communication, and pigeon English and Hiri Motu are used as common languages.

(2) Population

The population is estimated to be approximately 3,661,000 in 1989, and is increasing at annual rate of about 2.3%. Most of the people are classified as Melanesians by race, and subclassified to Papuan and Melanesian tribes.

The distribution of the population is different by regions, but it is more dense in the Highlands. In accordance with the 1980

Census, 29.3% of the population gravitates toward four major provinces of Eastern and Western Highlands, Simbu and Enga.

It has become difficult to maintain the conventional self-reliant economy due to penetration of a cash economy, and migration has occurred as workers seek opportunities for employment on plantations, in urban areas or for the mining industries.

The migration into urban areas, especially into Port Moresby, is significant and administrative and industrial functions are being expanded more rapidly in this area, because of this rapid urban growth, than in other areas.

2-1-2 National Economy

Gross domestic product (GDP) in 1987 was estimated to be around 2,763,800,000 Kina. The average proportion of GDP per person, divided by the population of 3,498,000, is equivalent to about 790 Kina (¥130,350 at ¥165/Kina). Income earned by expatriates is relatively high when compared to that of the average national.

The economic structure is a combination of self-reliant economy and cash (market) economy. Most of the self-reliant economy sector relies on rural products for household consumption. It is estimated that approximate 70% of the country's population relies on the self-reliant economy at present, but the proportion of the gross products in self-reliant economy sector is losing their weight in GDP. The proportion of self-reliant economy sector was recorded to be between 14 and 16% in 1980's. (See Table 2 in Appendix V)

The Papua New Guinean economy is highly dependent on primary products which tend to be influenced greatly by trends of international markets. In 1986 exports of gold products jumped and increased by 8.3% over the previous year, while exports of rural products, except coffee, were sluggish. Other major products include copper, cocoa, coffee, copra, lumbars, tea, and palm oil.

As the major living necessities and materials required for economic development are being imported, PNG depends substantially on the trend of the world economy. Consumers price index is gradually rising. The rate of inflation ranged from 3.0 to 5.3% for two years between 1985 and 1987.

2-2 GENERAL SITUATION OF HEALTH SERVICES IN PNG

2-2-1 General Situation of Health Services

(1) Health Service System

The health service system in PNG is characterised by a five-tier pyramid construction. At the apex is Port Moresby General Hospital (PMGH) functioning as a national referral hospital to support all other health service facilities in the country. Three provincial hospitals under this redevelopment programme are included in the hospitals under PMGH.

TABLE 2-1 HEALTH SERVICE REGIME IN PAPUA NEW GUINEA

	Primary Health Services	Secondary Health Services	Tertiary Health Services
Overseas Specialist Clinical Services			⊙
Port Moresby General Hospital (PMGH)	○	⊙	○
Provincial Hospitals	○	⊙	○
Health Centres	⊙	○	
Health Subcentres	⊙	○	
Urban Clinics Aid Posts	⊙		

⊙ Main services in charge ○ Sub services in charge

Most of the existing health service organisations in PNG are public and administered by central or provincial governments or by churches. A few private health service facilities are owned by large corporations (such as mining corporations), private

hospitals, and clinics of health centre level are owned by commercial factories, farms, and offices. In urban areas there are a very limited number of private clinics.

Some health service facilities are owned by the defence force, and health care services are provided by these facilities to defence force personnel and their dependents. These facilities are largely independent of other national organisations, but have several areas of participation and cooperation with the national and provincial health services.

The defence force medical services are provided free of charge for service personnel and their dependents. The level of services provided is generally of a high standard and is comparable to those offered by the Ministry of Health. Defence force health service facilities of base hospital level, regional hospital level or health centre level, are operated at several locations throughout the country.

(2) Health Services by Churches

Historically, missions and churches have played an important role in introducing health services to PNG. Starting with the help given by wives of the first missionaries in the 1870's when missionaries and their wives visited the country, then later as the services were taken over by trained nurses in 1884 and then on to the more formal services as seen today, the churches have played a leading role in providing health care services.

In 1966 the Churches Medical Council was formed to coordinate the health work of the various churches, and since then has been able to promote increased cooperation between its members and government health organisations.

At present the activities of churches are conducted with emphasis on two main areas; the provision of health services in rural areas; and the training of nurses, nurse aides, and aid post orderlies.

In 1984 churches were responsible for one provincial hospital, 27% of the health centres, 64% of health-subcentres and 5% of aid posts, providing quality health services in an efficient manner.

Operational costs of the church health service facilities are covered by governmental subsidies, institutional fees and donations. In most cases revenues are raised by churches within the country. It is often possible for the churches to obtain donations from overseas for special investment projects. Such funds have contributed to the opening of about forty new centres in the last six years.

The Government subsidies are extended from provincial government to assist the church health services with salaries, running costs, publicity, pharmaceuticals, simple equipment and supplies, and training.

(3) Present Situation of Health Services

Health services in PNG have been centred around primary health services as set forth in the First National Health Plan. Number of health centres and subcentres has been increased from 335 to 468, and the aid posts have been increased from 1,547 to 2,231 between 1973 and 1984. Secondary health services are defined as health services provided at hospital facilities which are operated by a total of 19 general hospitals, including PMGH and a specialised hospital (Laloki Psychiatric Hospital). Tertiary care is defined as "advanced and specialised treatment." Patients usually receive tertiary health services at health facilities overseas, but some of them are treated by foreign medical specialists who regularly visit the country.

1) Present Situation of Primary Health Services

Primary health services are provided by health centres and subcentres which have inpatient treatment facilities, and urban

clinics and aid posts which treat outpatients only. An outline of the primary health services provided is as follows:

(a) Functions of Primary Health Services

Major functions of primary services include the following:

- Curative Care: The situations have been greatly improved with increased health facilities, standardised treatments for major patterns of diseases, successful achievement in establishment of supply channels of pharmaceuticals for all health services, and improved confidence in the primary health services.
- Tuberculosis and Leprosy Control: The leprosy and tuberculosis control programmes were vertically organised programmes until 1978, when they were integrated into the primary health services. All the health workers have been trained so that they can provide base level curative services. Some provinces and districts still maintain specialised tuberculosis and leprosy orderlies. Others have still not achieved a complete integration of the old programme into their health services. Increased technical and management support is needed to make tuberculosis and leprosy control more successful.
- Sexually Transmitted Diseases: Treatment and control of sexually transmitted diseases rely on special clinics in most urban areas and on the primary health services in the rural areas. Unfortunately there is no standard treatment regime suitable for use by all health workers at present, and as a consequence, most of patients are not provided with adequate curative services. The problem is worse for women since most of the rural health workers are male.

- **Family Health Services:** Maternal and child health services are carried out at health centres, health-subcentres and by mobile teams. Health services include nutrition surveillance and education; immunisation for children; antenatal care; family planning; and health education. In practice, most of the time is given to child care, and the maternal care tends to be squeezed in at the end of the services.

Sometimes, poor relations with the district occur because of unreliable or inconvenient visiting schedules and attendances at the facilities. At present supervised home deliveries rarely take place, and institutional supervision is only available in hospitals, health centres and subcentres. About 40% of all deliveries are supervised.

- **Care of the Elderly:** Together with the reduced mortality rates, life expectancy has increased, and there are more old people in the villages than before. Diseases of old age are now appearing, creating a need for advice and assistance to help families to look after their elderly.
- **Dental Health Services:** Dental services are provided by dental officers and dental therapists. Most of these are based at provincial centres, but some therapists are stationed at the larger district health centres. At health centres where there is no dental therapist, dental emergencies and extractions are managed by health extension officers or orderlies.
- **Malaria Control, Environmental Health, and Water Supplies:** The revised malaria strategy requires drugs, instructors and vector source reduction through environmental and biological control.

The prevention of water-washed and water-borne diseases depends upon improved water supplies and environmental sanitation. However, these duties fall on the health extension officers and aid post orderlies due to shortage of health inspectors at rural areas.

(b) Primary Health Services 1986-1990

As stated above immediate action must be taken to improve the present health services, particularly in the rural areas. Immediate goals of primary health care services are stated as below:

- improving an access to those who live beyond two hours travelling time to a health facility;
- improving the service at aid posts in densely populated areas;
- meeting the increasing demand for supervised childbirth, and the care of gynaecological diseases, including sexually transmitted diseases;
- educating and re-educating health workers about their role in primary health care;
- improving morale of rural health workers by improving supervision;
- training senior provincial health staff in planning and management, and district staff in the recognition and practice of management teams;
- alleviating the workload of officers-in-charge of district health centres in heavily populated districts;
- reducing the isolation felt by rural health staff;
- maintaining, renovating and extending health facilities;
- ensuring regular maternal and child health services for mobile clinics; and
- improving laboratory facilities at health centres.

(c) Primary Health Services Facilities

- Health Centres

A health centre, headed by a health extension officer, is the base from which a comprehensive health service is delivered to the population of the health district, and

- 1: is responsible for the management of all health services in its district;
- 2: serves a population between 5,000 and 20,000 depending upon the population density and the ease of communications; and
- 3: provides inpatient and outpatient care; aid post supervision; maternal and child health care; family planning; and health education. In addition, some health centres may have X-ray and laboratory facilities, and some may provide dental services.

- Health-subcentres

A health-subcentre is an institution which serves a population ranging from 2,000 to 10,000 depending on the population density and the ease of communication. It provides outpatient, maternal and child health, obstetric and limited inpatient care. In some isolated areas they may also supervise and supply the surrounding aid posts. Health-subcentres are staffed by a nurse and nurse aides or orderlies. Nationally, 60% of health-subcentres are operated by churches.

- Aid Posts

An aid post is an institution providing a basic level of health care for a defined population of between 500

and 3,000. Staff is comprises aid posts and health orderlies. Its functions are:

- 1: the diagnosis and treatment of common illness both at the aid post as well as in villages and schools;
- 2: the referral to a health centre of patients needing attention beyond their skill;
- 3: the supervision of district health volunteers;
- 4: assistance with activities of health centres such as family health services and the immunisation programme;
- 5: provision of health education for the people in the area;
- 6: the domiciliary treatment of tuberculosis and leprosy patients;
- 7: the reporting of communicable disease outbreaks;
- 8: the supply of family planning devices;
- 9: keeping of records of activities and the preparation of a monthly report for submission to the health centre; and
- 10: participation in district development programmes.

- Urban Clinics

An urban clinic is an institution offering outpatient care for adults and children, and maternal and child care for well children and pregnant mothers. It serves an average population of 10,000 and has a health extension officer or, more usually, a nursing officer as officer-in-charge. It does not have overnight facilities, but has day observation beds.

(d) Role of Officer-in-Charge of Health Centre

- 1: The diagnosis, treatment and referral of patients.
- 2: Supervision of treatment activities by other staff.