BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE REDEVELOPMENT
OF
PORT MORESBY GENERAL HOSPITAL
IN
PAPUA NEW GUINEA

SEPTEMBER, 1988

JAPAN INTERNATIONAL COOPERATION AGENCY

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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 Project for the Redevelopment of Port Moresby General Hospital and the Japan International Cooperation Agency (JICA) sent to Papua New Guinea a study team headed by Dr. Naruo Uehara, Medical Official of the Department of International Cooperation, National Medical Centre Hospital, Ministry of Health and Welfare from May 23 to June 15, 1988.

The team had discussions on the project with the officials concerned of the Government of Papua New Guinea and conducted a field survey in the project site. After the team returned to Japan, further studies were made, a draft report was prepared and, for the explanation and discussion of it, a mission headed by Dr. Etsuko Kita, Medical Official of the Department of International Cooperation, National Medical Centre Hospital, Ministry of Health and Welfare was sent to Papua New Guinea from August 22 to August 31, 1988. As a result, the present report has been prepared.

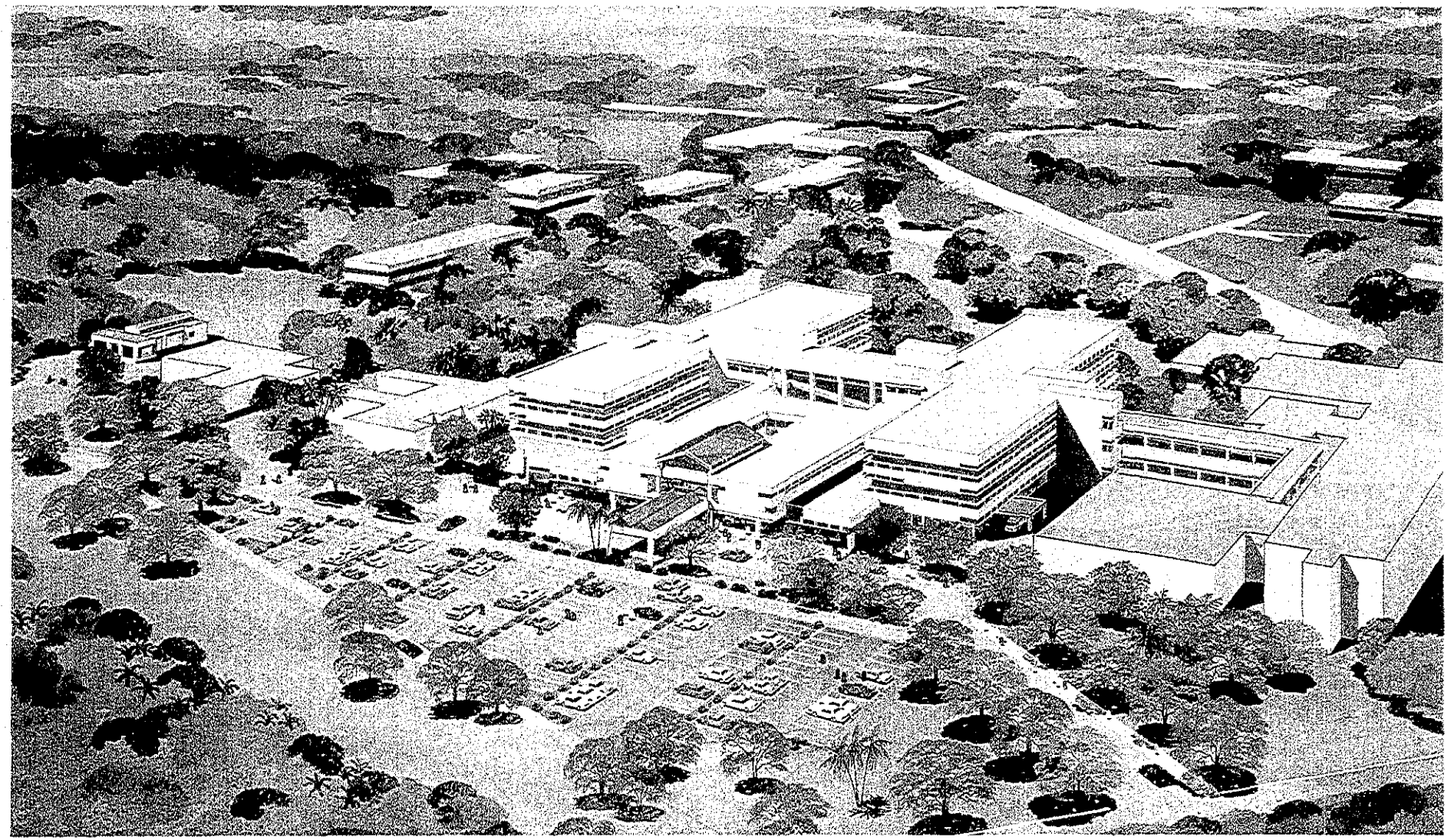
I hope that this report will serve for the development of the project and contribute to the promotion of friendly relations between our two countries.

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

September, 1988

Kensuke Yanagiya

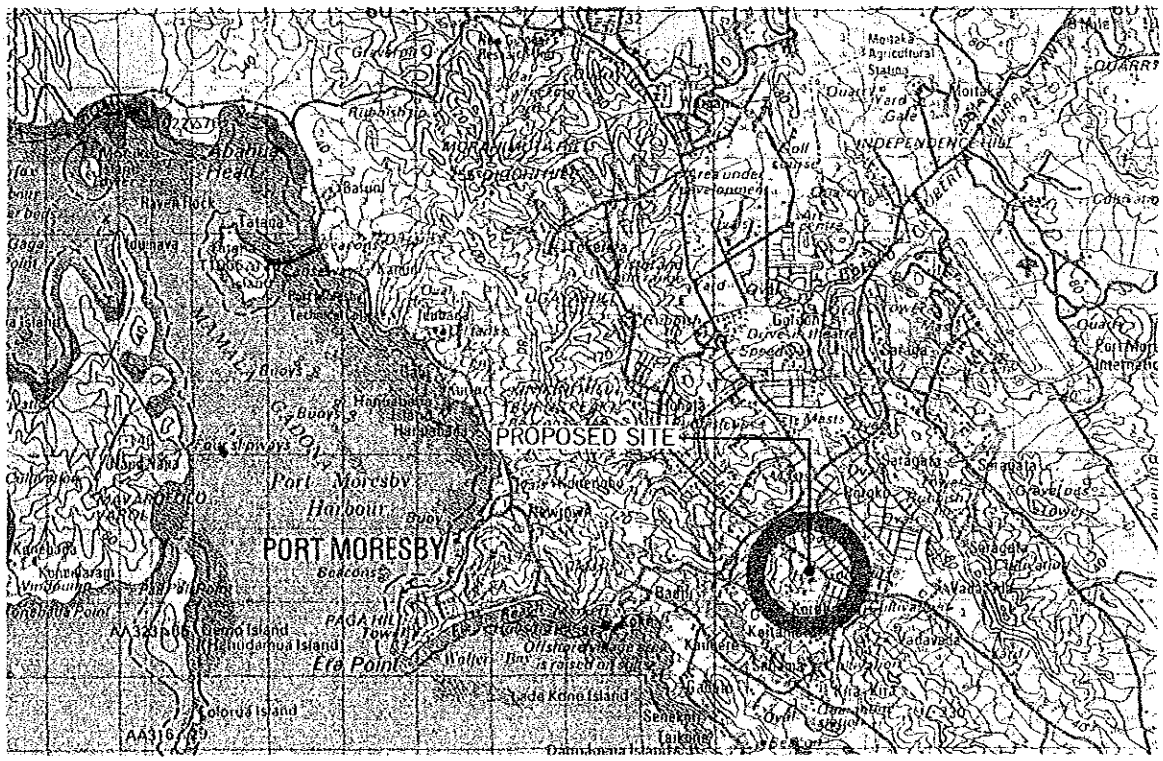
Kensuke Yanagiya
President
Japan International Cooperation Agency



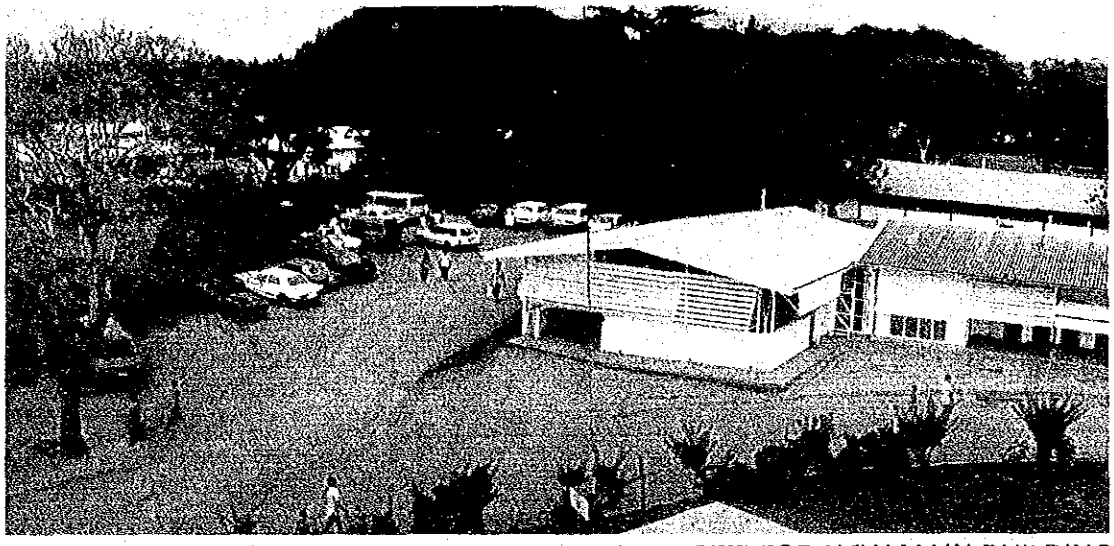
PORT MORESBY GENERAL HOSPITAL

PERSPECTIVE

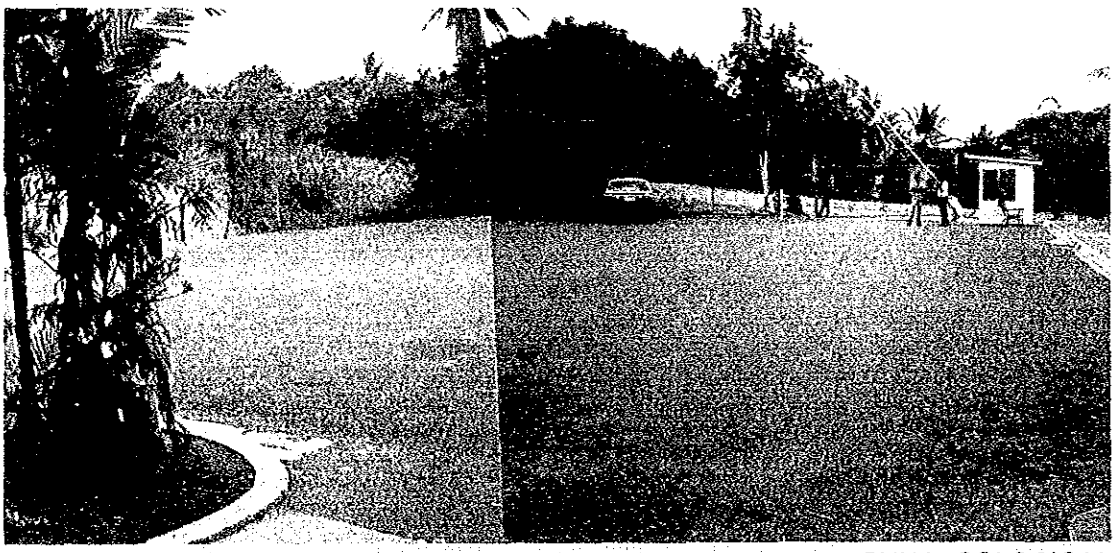
MAP OF PAPUA NEW GUINEA



MAP OF PORT MORESBY



PROPOSED SITE FOR NEW MAIN BUILDING



PROPOSED SITE FOR OBSTETRIC & GYNAECOLOGICAL
OPERATING THEATRE BUILDING

SUMMARY

SUMMARY

Papua New Guinea became independent in 1975. It is located between 1° S. Lat. and 12° S. Lat. with a total area of about 460,000km^2. The greater part of the land is in a high-temperature, high-humidity tropical zone. Its population was estimated at about 3,580,000 in 1988.

Noteworthy of the pattern of morbidity in Papua New Guinea is the fact that the three major diseases, namely pneumonia, malaria and epidemic enteritis, account for about 35 percent of the total number of cases, which includes that for postpartum disorders. If the number of cases of postpartum disorders is subtracted from the total number of cases, the above three main diseases represent as much as 43 percent of the total. The other common diseases include skin and subcutaneous diseases, diseases of musculoskeletal system and connective tissues, anemia, bronchitis, emphysema and asthma.

In 1985, the leading causes of mortality were pneumonia, postpartum disorders, epidemic enteritis, malaria, meningitis and tuberculosis. Infectious diseases such as pneumonia, epidemic enteritis, malaria and tuberculosis account for 46 percent of total death causes.

The health and medical care policies of the Government of Papua New Guinea were implemented with strong emphasis placed on primary health services under the First National Health Plan 1974-78, which was formulated based on the Eight-point Improvement Plan of 1974. Extensive efforts were made to increase the number of health centres, health subcentres, aid posts, and other health and medical health institutions.

As a result, it was found through the 1971 and 1980 censuses that there had been significant improvements in health statistics such as the neo-natal mortality rate, the infant mortality rate, and the average life span. And, in 1985, 96 percent of the nation's total population were able

to reach medical health facilities within 2 hours.

On the other hand, there was no significant change in the pattern of main diseases, with infectious diseases such as epidemic enteritis, malaria, respiratory organ diseases and sexually transmitted diseases still being the nation's main diseases. Although it had been expected that these diseases would decrease in number, in keeping with the enhancement of the level of medical health services, they have actually risen.

The Government of Papua New Guinea tried to resolve this situation by working out and implementing the Second National Health Plan 1986-90. This plan, in which top priority is given to a quantitative expansion of primary health services, is considered the fastest and most economical means to attain the goals of the national government's health care policy based on the Eight-point Improvement Plan of 1974 and to ensure that they are:

- Participation ..... Participating in decision making in the area of health and medical care.
- Equitableness ..... Equal opportunities in medical care.
- Appropriateness ..... Establishment of appropriate health and medical care standards.
- Collaboration ..... Collaborating with government agencies and local communities.
- Effectiveness ..... Maximum cost-effectiveness.

Furthermore, the national government intended to reinforce the system for supporting the primary health services by improving the functions of the secondary health services and thereby enhance the quality of primary health services.

In order to implement the above health care policy, the national government decided to work out a master plan on hospitals as the first step, and then conduct a detailed analysis of the current state of hospitals as the second step.

Consequently, a nation-wide survey was carried out in 1986 and 1987 with the assistance of the Australian Government and the Asian Development Bank.

On the basis of the results of this survey, the national government reached the conclusion that it was necessary to improve the functions of Port Moresby General Hospital - as a teaching hospital, a provincial hospital and a primary health services centre - by streamlining hospital operations, and increasing the total number of beds, thereby increasing its ability to accept patients as a national referral hospital. Subsequently a request was made of the Government of Japan to extend grant aid cooperation for redeveloping Port Moresby General Hospital. In response thereto, the Government of Japan decided to carry out a basic design study concerning the requested grant aid cooperation, and the Japan International Cooperation Agency (JICA) dispatched the Preliminary Survey Team in February 1988 and the Basic Design Study Team in May 1988 to study the background to and details of this project, the present situation of Port Moresby General Hospital, the system for operating and managing this project, the possibility of operation budget allocation, the proposed construction site, etc.

In Papua New Guinea, administration of health care services is under the control of the Department of Health. Under the national government's policy to decentralise administrative activities, the Department of Health draws up The National Health Plan and provides provincial governments with technical support and advice on health care services. Provincial governments are responsible for implementation of their respective health care programmes.

The nation's health care system is characterised by a hierarchical organisation, with Port Moresby General Hospital, a national referral hospital, at the top, followed by base hospitals, provincial hospitals, primary health facilities such as health centres, health subcentres and aid posts.

Since Port Moresby General Hospital is the only hospital that citizens residing in Central Province and the National Central District (NCD) can use, it has to serve as the national referral hospital and a primary health services centre for Central Province and NCD, in addition to being the teaching hospital for the Faculty of Medicine of Papua New Guinea University and the College of Allied Health Sciences, Port Moresby.

At present, Port Moresby General Hospital has 798 beds, 90 doctors, 341 registered and practical nurses and 88 other medical technicians. In 1987, a total of 22,336 inpatients and a total of 462,000 outpatients received medical health services at the hospital.

Since 1957 when Port Moresby General Hospital was founded as a hospital with a total of 350 beds, its facilities have been extended and remodeled, but not under a comprehensive long-term policy. The result is that the arrangement of the facilities is extremely inefficient, with many of them scattered on the spacious site. The hospital is presently unable to function as a national referral hospital, an educational hospital or a primary health service centre. Still worse, it is unable to provide effective support to provincial hospitals which are mainly responsible for primary health services in rural areas. Furthermore, the Walter Strong Wing, a wooden building constructed in 1957, is no longer safe to use. It was constructed as a building to last 25 years. As a result, there have been substantial increases in the cost of operating and maintaining the building.

On the basis of the request made by the Papua New Guinean Government concerning this project, which was worked out with a view to improving the above-mentioned conditions and as a result of analyses of the survey data including the present conditions of the local health services, the proposed construction site, the infrastructure, the local construction industry and the available medical equipment maintenance services in Papua New Guinea and the existing Port Moresby General Hospital, the contents and scale of each of the facilities suited for this project were determined as enumerated below.

In designing the facilities, top priority has been given to functional aspects of the facilities so that they may provide space for efficient medical services. Also, due consideration has been given to easy maintenance of the facilities in order to reduce maintenance costs.
Since the additional facilities are to be integrated with existing facilities, due account was taken of their compatibility with existing facilities. The present congested arrangement of the power lines, emergency generator, and water main supply, will be modified and improved for rationalisation.

With respect to medical equipment, more efficient use will be made of the existing equipment. In principle, the additional facilities are to operate using the existing medical equipment. However, new fixed medical equipment, such as operating tables, astral lamps, X-ray apparatus, and movable equipment in minimum quantities, will be installed in the new facilities .

- Proposed construction site:

  Korobosea, Port Moresby

- Total floor area:

  About 15,000 m^2

- Structure and No. of stories:

  Reinforced concrete 3-story building (partially one-story)

- Facilities

  (1) New Main Hospital building

  1) Outpatient Department

  Outpatient Dept., Casualty Dept., Specialist Clinic

  2) Pharmacy Department

  Dispensary, General Storage, Pharmacist Office

  3) X-ray Department

  X-ray room

  4) Wards

  Paediatric: 150 beds; Surgical: 160 beds; General medical: 230 beds; Psychiatric: 40 beds

  (2) Mortuary

  Autopsy, Body Storage

  (3) Obstetric and Gynaecological Operating Department

  Operating room

  (4) Other

  Mechanical Building, Pump Building, Road, Car Park

- Medical Equipment

  (1) New Main Hospital Building

  1) Outpatient Department

  Operating table, Nebuliser, Electrocardiograph, ENT treatment unit, etc.

2) Pharmacy Department

Distilled water apparatus, Dispensing table, etc.

3) X-ray Department

Fluoroscopy X-ray machine, etc.

4) Wards

Ice making machine, Bed pan steriliser, Bed, etc.

(2) Obstetric and Gynaecological Operating Department

Operating Table, Operating light, Diathermy machine, etc.

In Papua New Guinea the Department of Health will be responsible for implementation of this project, and the Department of Works for approval and permission regarding the architectural aspects. After completion, the improved facilities will be operated and managed under the control of the Secondary Health Services Division in the Department of Health.

The total project implementation period is estimated to be about 29.5 months after the signing of Exchange of Notes, of which 21.0 months have been allocated for construction works of Phase 1 and Phase 2.

The opening of the hospital will contribute to the increase of number of beds by 113 to a total of 911.
However, the hospital can be operated and managed by the number of personnel currently working there after completion of this project, unless drastic changes occur in the nursing unit composition and the method of nursing.
Furthermore, the facilities and equipment will be designed and the building materials will be selected in such a manner as will minimize the costs for operating and maintaining them.

It is expected that the enhancement of the level of medical services, the fostering of medical specialists, the improvement in the functions of the hospital and the increase in the overall operations at the hospitals resulting from the implementation of this project will lead to a significant improvement in secondary health services and primary health services. The support of local hospitals will in turn help enhance the quality of basic medical services throughout Papua New Guinea. In this context, this project is judged to be of great significance. It is therefore reasonable and advisable for the Government of Japan to provide grant aid for improvement of the facilities of Port Moresby General Hospital in Papua New Guinea.

The following recommendations are made for the earliest possible start-up this project and the smooth and effective operation of the facilities constructed.

- Securing continuous and safe continuation of medical services at the hospital during the implementation period of this project.
- Smooth implementation of the works by the Papua New Guinean side.
- Nurthuring medical specialists.
- Recruiting the additional personnel required for efficient administration of the hospital.

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Annex 1

Annex 2

CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

The health care system in Papua New Guinea is characterised by a pyramid organisation. At the top is Port Moresby General Hospital which serves as the national referral hospital. Beneath that are base hospitals and provincial hospitals serving as secondary care facilities and health centres and health subcentres serving as primary health facilities. As there still is much room for raising the standard of the nation's health care services, the Government of Papua New Guinea is currently in the process of expediting the establishment of a comprehensive health care network centred around primary health services with a view to providing all of Papua New Guinea's people with equitable health care services.

While the people of Papua New Guinea were preparing themselves for complete independence, which was realised in 1974, an Eight-point Improvement Plan on health care was made public by the government. Under this Plan, the First National Health Plan 1974-78 was worked out and health care policy measures were implemented with top priority given to primary health services. As a result, there was a substantial increase in the number of primary health facilities, such as health centres and health subcentres. In 1985 as much as 96 percent of the nation's population was able to reach health care facilities within two hours.

According to the census conducted in 1980, the neo-natal mortality rate had decreased from 134/1000 to 72/1000 and the infant mortality rate, from 79/1000 to 42/1000. During the same period the average life span had increased from 40.4 years to 49.6 years.

On the other hand, the pattern of main diseases has remained unchanged since 1971.

There have been no significant changes in the pattern of diseases contracted by outpatients, with 40 percent of them suffering from pneumonia, malaria and diarrhoea. This reflects the fact that no effective health care services have been offered despite a substantial increase in the number of primary health facilities.

Although preventive measures against tuberculosis, malaria and venereal diseases are being implemented, medical and welfare programmes for mothers and children and activities for promoting the concept of public health, the number of sufferers from common diseases is on the rise. Promotion of the benefits of preventive injection has not resulted in a significant increase in the immunity rate, and the number of children suffering from diarrhoea has decreased only a little. We may rightly point to a need to raise the general standard of living and improve the environment for public health, rather than attempting to treat diseases, as a means of solving these problems. But it is self-evident that there is an equally important need to improve the quality of the nation's health care services, since they have already undergone a substantial quantitative expansion.

As an example, childbirths, which carry a significant weight in the nation's health care services, bleeding after delivery accounts for 25 percent of maternal deaths, blood poisoning after delivery 27 percent, and delayed delivery 9 percent. This situation has remained almost unchanged since 1976. Furthermore, one survey reports that bleeding after delivery is involved to some extend in 94 percent of total maternal deaths. This indicates that proper medical services are not available for childbirths and evidences the need to improve the basic quality of the nation's medical services.

In an attempt to resolve these problems, the Government of Papua New Guinea worked out the Second National Health Plan 1986-90. In this programme, the most emphasis is placed on primary health services in

compliance with the Eight-point Improvement Plan on health care and the government's goals of "participative", "equitable", "appropriate", "collaborative", and "efficient" health care. At the same time, the Government of Papua New Guinea realized that it was essential to improve the quality of primary health care in order to solve these problems. As a result, the government worked out the following three objectives for the current national health care programme:

- To improve the quality and efficiency of existing health services and infrastructure;

- To increase emphasis on self-reliance and community participation in health and development activities;

- To provide more effective health education and information to assist all members of the community to prevent illness and to lead healthier life styles.

Furthermore, the government decided on the following two additional objectives on the basis of its conclusion that positive support by secondary health care services was necessary to attain the goals of the primary health services:

- To establish a comprehensive general hospital system capable of providing basic nursing, diagnosing and treating services.

- To take all measures necessary to improve the quality of health care services, particularly primary health services.

In order to attain these objectives, the government decided to draw up a general master plan on hospitals as the first step and conduct a detailed analysis of the plan as the second step. In 1986 and 1987 a nation-wide survey of the prevailing conditions of health care in the country was carried out with the assistance of the Government of Australia and a

survey of hospital medical services in the country with the assistance of the Asian Development Bank.

On the basis of the results of the above-mentioned surveys, the Government of Papua New Guinea decided that the government expenditure for secondary health services should not exceed 45 percent of total budget for the Department of Health and that it was necessary to improve the facilities of Port Moresby General Hospital with minimum costs for operation, personnel and maintenance as the first step toward general redevelopment of hospital facilities. The reasons for the latter include:

- Port Moresby General Hospital has not been extended and remodeled under a specific master plan, so that various functions are scattered throughout its spacious premises. As a result, the hospital is presently suffering from a marked decrease in efficiency. It remains incapable of performing either its functions as a national referral hospital of providing effective support for primary health services and the provincial hospitals which actually support primary health services.

- Due to the shortage of beds, the hospital is forced to shorten periods of hospitalization to allocate more time for treatment of outpatients and to have patients from remote places return home to receive primary health services at local primary health facilities. It is therefore essential to increase the number of beds in the hospital.

- Many of its facilities, particularly those of the wards, are superannuated, which has caused increases in maintenance costs.

On this basis, the Government of Papua New Guinea decided to improve the facilities of Port Moresby General Hospital in order to increase the hospital's ability to accept patients as a national referral hospital. This was to be achieved by improving its functions, installing 580 beds, replacing the deteriorated existing wards, and making the hospital perform

minimum functions as a teaching hospital. In addition, the Government was to contribute to the improvement of primary health services through provincial hospitals. The Government of Japan was requested to provide a grant aid for this purpose.

In response thereto, the Government of Japan decided to carry out a basic design study concerning the grant aid requested by the Government of Papua New Guinea. In February 1988, the Japan International Cooperation Agency (JICA) dispatched a preliminary survey team to Papua New Guinea to examine and discuss with representatives of the Government of Papua New Guinea the contents of the request.

The Japanese preliminary survey team confirmed that the Papua New Guinean side's need for implementation of the project with the assistance of the Government of Japan was strong enough and that it was necessary for the Government of Japan to implement as soon as possible a basic design study related to the projected grant aid. In May 1988, the Japan International Cooperation Agency dispatched a basic design study team to Papua New Guinea. On the basis of the results of the preliminary survey, the team conducted the following investigations to determine the feasibility of the projected grant aid:

(1) Analysis of the background and the propriety of the proposed project.

(2) Survey of the current situation of health services and health care education and training in Papua New Guinea.

(3) Positioning of the proposed project relative to the second National Health Plan 1986-90.

(4) Consultations with the Papua New Guinean side on the contents and scale of the proposed project.

(5) Confirmation of the systems for implementing the project, operating and managing the prospective facilities, the scope of works by the Papua New Guinean side and budgetary appropriations for the project.

(6) Investigation of the projected construction site.

(7) Investigation of the existing facilities and medical equipment of Port Moresby General Hospital.

(8) Investigation of the present conditions of operation and management of Port Moresby General Hospital.

(9) Investigation of the present conditions of the Papua New Guinean construction field.

This report describes the results of the analysis in Japan on the above mentioned surveys and the briefing on the draft final report, which was conducted in Papua New Guinea in August 1988. Annex, including the field study schedules, are included at the end of this report.

CHAPTER 2 BACKGROUND OF THE PROJECT

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2-1 Outline of Papua New Guinea

2-1-1 Land and Population

(1) Land and Languages

The land area of Papua New Guinea is about 460,000 Km^2. The country is situated between 1° S. Lat. and 12° S. Lat. Most of Papua New Guinea's land area is in the tropical rain forest zone and there are many mountains which rise 4,000 meters or more above sea level. The most famous of them is Mt. Wilhelm, which rises 4,509 meters above sea level. 70~86% of the total land area is covered by forests.

More than 700 different languages are used by the more than 500 tribes in Papua New Guinea. English is used as the official and educational language.

(2) Population

In the censuses conducted in 1966, 1971 and 1980, the nation's population numbered 2.18 million, 2.49 million and 3.01 million respectively.

The 1971 census was conducted on 10 percent of the total rural villages and all cities. In 1980, on the other hand, a census was taken of the nation's total population. It should be noted that different survey and tabulation methods were used in the three censuses.

The High Land region has a high population density. The three provinces in this region -- Western Highlands, Chimbu and Eastern Highlands, have a population of 720,674, which accounts for 23.94 percent of the nation's total population. This population is concentrated in the total area of

25,800 km^2, which represents only 5.57 percent of the nation's total land area. In Papua New Guinea the migratory movement toward plantations and cities takes two forms -- one for regular employment and one for seasonal jobs. Examples of the former are seen in such provinces as Manus, East New Britain, North Solomon, and the National Central District. The latter are from South Highlands to the coffee plantation in West Highland. In recent years, the migratory movement toward Port Moresby has been particularly conspicuous.

Table 2-1 Citizen Popuation Projection based on 1980's Census, by Province, 1980~1994

(Unit: 1000)

Province	Grow Rate (1980-2000)	1980	1982	1984	1986	1988	1990	1992	1994
Western	2.6	78.3	82.7	87.2	91.7	96.6	101.5	106.5	111.8
Gulf	1.8	63.8	66.2	68.9	71.6	74.4	77.0	79.9	83.2
Central	2.1	116.4	121.0	126.9	132.8	138.8	144.6	151.0	158.1
NCD	3.9	112.4	122.1	132.0	141.5	150.6	158.7	166.6	174.4
Milne Bay	2.7	127.7	134.7	142.5	150.6	150.0	166.6	174.7	183.4
Northern	2.6	77.1	81.3	85.7	90.3	95.2	100.0	104.9	110.0
South Highlands	1.5	135.6	243.0	251.0	259.5	263.0	278.0	288.2	299.2
Enga	1.3	164.4	168.9	173.9	178.6	133.8	189.6	195.9	202.1
West Highlands	2.1	164.1	275.4	287.8	300.2	312.8	324.9	337.3	350.1
Chimbu	0.7	178.0	179.6	1,3.2	136.4	189.3	192.1	195.2	198.9
East Highlands	1.8	176.4	242.0	295.1	306.3	317.6	328.2	339.0	351.2
Morobe	2.6	105.4	321.4	339.2	357.1	375.8	394.0	412.9	432.6
Madang	2.6	109.7	220.6	232.8	245.7	259.8	275.5	292.2	310.3
East Sepik	2.3	120.8	231.1	242.8	254.9	268.2	281.8	296.2	312.2
West Sepik	1.9	113.8	118.3	123.3	128.3	133.4	135.6	144.2	150.4
Manus	2.2	25.9	27.0	28.3	29.9	31.5	33.1	34.8	36.7
New Ireland	2.6	65.7	69.1	73.1	77.2	81.5	85.8	90.4	95.4
Eeat New Britain	2.7	130.7	138.0	145.9	154.2	163.3	172.2	181.5	190.7
West New Britain	3.2	95.4	94.5	100.9	107.7	114.3	121.9	129.5	137.7
North Solomons	3.4	125.5	134.2	144.2	154.5	165.5	176.5	188.5	201.3
Total	2.2	2,978.3	3,113.3	3,264.7	3,419.0	3,580.1	3,740.6	3,909.3	4,089.9

(Source: Handbook on Heath Statistics 1985)

Note: The population is citizenship owning population. The residents without citizenship and naturalized inhabitants are excluded from governmental statistics. According to the 1980's population census the residents without citizenship and naturalized inhabitants were approximately 33,000 people.

2-1-2 National Economy

The Papua New Guinean economy, which is highly dependent on exports of primary products, tends to be influenced greatly by trends in international markets. In 1984 exports of mineral products (40.3 percent), coffee (13.6 percent), cocoa (8.2 percent), and copra (11

percent), accounted for 73.1 percent of the nation's total exports. This fact explains why the growth rate for the nation's GDP has been recording cyclical declines. It appears that the most important causes for this trend of the nation's GDP are prices of mineral products, notably copper, gold and silver, and trends in investment in mines.

On the other hand, it can be pointed out that the non-market economy sector is an important factor in the Papua New Guinean economy. The nation's non-market economy sector is mostly agricultural production for self-consumption. It is estimated that 70 percent of the nation's total population belongs to the non-market economy sector, but the ratio of this sector to the nation's GDP has been declining from year to year. (see Table 2-2)

Table 2-2 Sectoral Distribution of G.D.P.

(Unit: Kina (millions), %)

	1983	%	1984	%	1985	%	1986	%
Economic								
Agriculture, Forestry and Fishing	338.70	17.16	434.80	20.37	442.30	19.42	481.60	19.56
Mining & Quarring	210.80	10.68	109.40	5.13	247.50	10.87	294.40	11.96
Commerce	156.60	7.93	184.70	8.65	178.00	7.81	193.80	7.87
Manufacturing	178.80	9.06	210.90	9.88	203.20	8.92	221.30	8.99
Finance	133.90	6.78	157.90	7.40	152.20	6.68	165.80	6.74
Sub Total	1018.80	51.62	1097.70	51.43	1223.20	53.70	1356.90	55.12
Infrastructure								
Construction	70.40	3.57	83.00	3.89	80.00	3.51	87.10	3.54
Transport & Storage	68.30	3.46	80.60	3.78	77.60	3.41	84.50	3.43
Electricity, Gas, Water, Communications, etc.	28.80	1.46	34.00	1.59	32.70	1.44	35.60	1.45
Sub Total	167.50	8.49	197.60	9.26	190.30	8.35	207.20	8.42
Social Services	225.80	11.44	242.00	11.34	257.40	11.30	262.00	10.64
Administration	147.10	7.45	157.60	7.38	167.60	7.36	170.60	6.93
Sub Total	1559.20	79.00	1694.90	79.41	1838.50	80.72	1996.70	81.11
Import Duties	91.10	4.62	107.40	5.03	103.60	4.55	112.80	4.58
GDP (Market Component)	1650.30	83.61	1802.30	84.44	1942.10	85.27	2109.50	85.70
GDP(Non-Market Component)	323.40	16.39	332.20	15.56	335.60	14.73	352.10	14.30
GDP(Both Components)	1973.70	100.00	2134.50	100.00	2277.70	100.00	2461.60	100.00
Constant Prices (1981 Price Level)								
GDP(Market Component)	1451.60		1432.60		1534.10		1588.90	
GDP(Non-Market Component)	292.40		289.20		286.20		291.90	
GDP(Both Components)	1744.00		1721.80		1820.30		1880.90	
Gross Fixed Capital Formation	547.20		433.30		364.30		395.50	
Population (1000)	3189		3281		3353		3426	
GDP at Constant Prices (Market Component)/ Head (Kina)	455.19		436.64		457.53		463.78	
GDP at Constant Prices (Both Components)/ Head (Kina)	546.88		524.78		542.89		548.98	

(Source: National Statistical Office)

2-1-3 National Development Programmes

The Government of Papua New Guinea made public the "The Eight-point Improvement Plan" and the "National Objectives and Guideline" in 1974 as the basis for its basic national development policy formulation.

"The Eight-point Improvement Plan":

(1) Papua New Guinean people's participation in the national economy.

(2) Fair distribution of social wealth.

(3) Elimination of centralisation of economic activities, economic planning and government expenditure.

(4) Promotion of small-scale industries.

(5) Economic independence.

(6) Fiscal independence.

(7) Women's participation in social activities.

(8) Strengthening the government's leadership in the area of economy.

In 1976, the Government of Papua New Guinea formulated its national development policies as the nation's broad guideline for individual economic and development policies. However, this guideline did not result in concrete achievements because decreasing of national finances.

The Government of Papua New Guinea made public the National Planning and Budgeting Strategy 1988-92 prior to the conference for assisting Papua New Guinea which was held in May 1988 in Tokyo.

This strategy included the following four points as the "medium-term development goals."

(1) The achievement of sustained economic growth.

(2) The creation of income-earning opportunities in rural areas.

(3) The establishment of fiscal self-reliance.

(4) The reduction of social and economic inequalities.

2-2 General Situation of Health Services in Papua New Guinea

2-2-1 General Situation of Health Services

(1) Health Service System

The health service system in Papua New Guinea is characterised by a 5-tier pyramid organisation. At the top is Port Moresby General Hospital which serves as the national referral hospital in support of all other health service facilities.

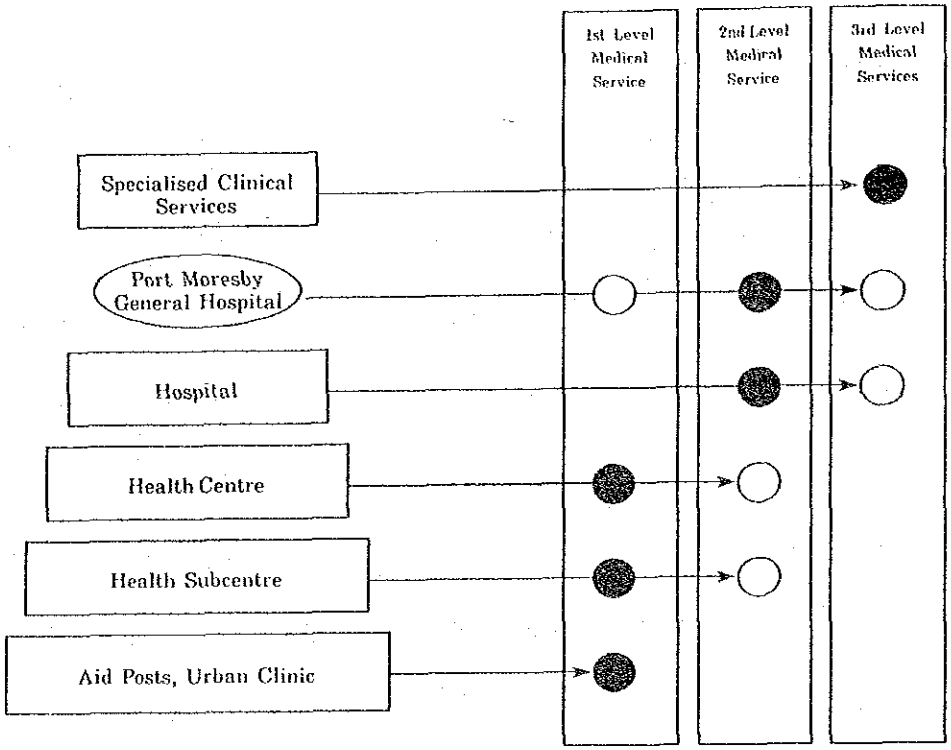

Fig. 2-1 Papua New Guinea's Medical Service Pyramid

Most of the health service organisations in Papua New Guinea are government or church managed public health service organisations. Private health service organisations are hospitals operated by business corporations (such as Bougainville Copper Company and OK Tedi Company), a recently established private hospital (Arawa), and clinic in factories,

farms and offices which provide health centre-level health services. In urban areas there are a very limited number of private doctors' offices. According to the data obtained from the Department of Health, 12.4 percent of doctors and more than 25 percent of dentists were working in the private health services in 1984. In addition to these, there are some military health service facilities, such as Lombrum Hospital (Province of Manus), Taurama Health Centre - which provides regional hospital-level health services (Port Moresby) - and health centre-level health service facilities in Wewak, Lae and Goldie River.

Table 2-3 Distribution of Hospitals, Health Centres, Subcentres and Urban Clinic between the Department of Health and Church Health Services

31. 12. 1985

Province	Hospitals			Health Centres			Health Subcentres				Urban Clinic	Aid Posts
	DOH	CHS	TOTAL	DOH	CHS	TOTAL	DOH	CHS	Others	TOTAL	DOH	Total
Western	1		1	9	2	11	2	16	1	19		106
Gulf	1		1	6	3	9	2	6		8		70
Central	—		—	6	2	8	14	9		23		124
NCD	2		2	—	—	—	—	—		—	9	7
Milne Bay	1		1	7	1	8	3	23		26		96
Oro	1		1	4	1	5	7	4		11		86
Southern Highland	1		1	*11	2	13	3	20		23		178
Enga	—	1	1	7	3	10	5	4		9		130
Western Highland	1		1	7	4	11	4	4		8		160
Chimbu	1		1	6	1	7	7	5		12		96
Eastern Highland	1		1	6	1	7	9	13		22	1	131
Morobe	1		1	13	4	17	6	1		7	5	240
Madang	1		1	12	7	19	2	6		8	2	169
East Sepik	1		1	9	3	12	6	14		20	1	169
West Sepik	1		1	8	2	10	—	18		18		127
Manus	1		1	4	3	7	—	—		—		56
New Ireland	1		1	3	5	8	11	4		15	2	65
East New Briten	1		1	8	3	11	1	9	1	11	1	61
West New Briten	1		1	6	3	9	1	10		11	1	82
North Solomons	1		1	5	3	8	12	6		18	23	78
Total	19	1	20	137	53	190	95	172	2	269	23	2,231
				72%	27%	100%	35%	65%		100%		

(Source: Department of Health)

* One Health Centre jointly run by DOH and CHS

Note: Private and Military Medical Services are excluded. The 2 hositals in the National Capital District are Port Moresby General Hospital and Laloki Psychiatric Hospital

(2) Health Services by Churches

Health services by churches date back to 1870 when a mission visiting the country introduced a health service. In 1966 full-scale health services, provided by nurses dispatched from churches, started. Currently churches are implementing extensive medical training programmes to train nurses, nurse aids, and aid post orderlies across the country, thereby greatly contributing to the improvement of the nation's health services.

In 1984, churches were operating a provincial hospital, 27 percent of health centres, 64 percent of health sub centres and 5 percent of aid posts. These facilities are providing health services of high quality and efficiency. Since the 1960s the national government has been bearing part of the costs for operating and managing these church-run hospitals, the rest being covered by doctor's fees and donations. Most of the donations come from overseas and are used to fund the opening of new facilities. In the past six years as many as 40 centres have been opened.

The national subsidies provided by provincial governments are used for payment of salaries, operation and management expenses, public relations expenses (including travel and lodging expenses), expendable expenses (simple equipment and medicines), and training expenses (operation and management expenses, scholarships and lecturers' salaries).

(3) Present Situation of Health Services

Health services in Papua New Guinea have been centred around primary health services and, since the nation became independent, have been aimed primarily at quantitative expansion and equality services. In Papua New Guinea, secondary health services are defined as health services provided at hospital facilities and are operated by the government or churches. A total of 19 general hospitals, including Port Moresby General Hospital and a specialised hospital (Laloki Psychiatric Hospital) are responsible for secondary health services. 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 Papua New Guinea.

1) Present Situation of Primary Health Services

Primary health services is provided by health centres and health sub centres which have inpatients treatment facilities, and urban clinics and aid posts which treat outpatients only. Outline of the primary health services in Papua New Guinea is as shown below.

(a) Functions of Primary Health Services

- Curative Care

  There has been a remarkable improvement in Curative Care owing to (1) increase in the total number of facilities, (2) establishment of treatment standards regimes, (3) establishment of pharmaceutical supply system and (4) increased confidence in primary health care.

- Tuberculosis and Leprosy Control

  As a result of a shift from vertically organised programmes, primary health services activities by provincial governments have been stepped up, which in turn has resulted in widespread public interest in preventive medicine. However, there is still room for improvement in technical guidance and control.

- Sexually Transmitted Diseases

  Treatment standards and staff training are yet to be improved.

- Family Health Services

  Immunisation of children, guidance on nutrition and family planning are the areas which are being promoted actively.

- Care of the Elderly

  There has been a marked increase in the elderly population as life expectancy has been lengthened.

- Dental Health Services

  Some of health centres have no dental therapists or dental treatment.

- Malaria Control, Environmental Health and Water Supplies

  Health inspectors are responsible for guidance on prevention of malaria, and control of the quality of drinking water. In actuality, however, due to the shortage of health inspectors, health extension officers and aid post orderlies are conducting these activities.

(b) Goals of Primary Health Services

In the second National Health Plan 1986-90, the goals of primary health services are set as follows.

Goals for 1986-90

- To expand access to health facilities in remote areas (so that all residents can receive health services within 2 hours.)

- To improve services provided at aid posts.

- To meet the increasing demand for supervised childbirth and the care of sickness in women, including sexually transmitted diseases.

- To educate and reeducate health workers.

- To improve morale of rural health workers.

- To train senior provincial health staff in planning and management, and district staff in the concept and practise of management teams.

- To alleviate the workload of health extension officers of district health centres.

- To reduce the isolation felt by rural health staff.

- To maintain, renovate and extend health facilities.

- To ensure regular maternal and child health schedules for mobile clinics.

- To improve laboratory facilities at health centres.

(c) Primary Health Services Facilities and Their Functions

The Table 2-4 shows the types of primary health services facilities, the population of the district covered by each type of facility, officer in charge of each type of facility, and functions of each type of facility.

Table 2-4 Primary Health Service Facilities and their Functions

Designation	Served Population	Administrative Authorites(D.I.C.)	Function
Health Centres	5,000~20,000	Health Extension Officer (HEO)	1. Inpatient and outpatient care 2. Aid post supervision 3. Material and child health clinics 4. Family planning 5. Disease control programmes 6. Environmental improvement
Health Subcentres	2,000~10,000	Nurse and Nurse Aides	1. Outpatient care 2. Maternal and child health care 3. Obstetric and (limited) patient care
Aid Posts	500~3,000	Aid Post Orderly (APO)	1. The diagnosis and treatment of common illness 2. The referral of patients to a Health Centre (when the required attention is beyond his or her skill). 3. The supervision of community health volunteers 4. Assitance to the health Centre (family planning, immunisation programe) 5. Provision of health education 6. The reporting of communicable disease outbreaks 7. The domiciliary treatment of tuberase outbreaks leprosy patients 8. The supply of family planning methods 9. The preparation of a monthly report for submission to the Health Centre
Urban Clinic	10,000	Health Extension Officer (HEO) Nursing Officer	1. Outpatient care for adults and children 2. Prgnant mothers care

(d) The Roles in primary health services of Health Extension Officers and Nursing Officers

The tasks of the health extension officers and the nursing officer as managers at health centres are set forth as follows.

- Health Extension Officer

1. The diagnosis, treatment and referral of patients.

2. Supervision of treatment activities by other staff.

3. The planning and supervision of all community health activities (including family health services and immunisation)

4. Health education and environmental improvement

5. Supervision of health subcentres and aid posts.

6. Disease control, including tuberculosis leprosy and outbreaks of communicable diseases.

7. The administration of the health centre, including preparation of reports.

- Nursing officer

1. Curative services

2. Immunisations

3. Nutrition surveillance

4. Midwifery services

5. Family planning and health education

(e) Criteria for Staffing to Engage in Primary Health Care Activities

The number of staff is determined according to the following criteria.

Table 2-5 Criteria for Staffing

	Standard		person
Health Extension Officer	Population	15,000	1
Nursing Officer	Population	5,000	1
Nurse Aides, Orderly	Nursing Officer	1	2
	Outpatient	30	1
	Inpatient	10	1
	Tuberculosis and Leprosy Patients	30	1
	Aid Posts	10	1

(Source: National Health Plan 1986/90)

2) Present Situation of Secondary Health Services

As top priority is given to the establishment and consolidation of the primary health services system, no significant programmes for quantitative expansion in the quality of hospital facilities, at which primary health services are mainly provided, has been worked out yet. It is the intention of the Government of Papua New Guinea to limit secondary health-related development programs to those which will contribute to the improvement in the organisation and functions of the primary health services.

(a) Functions of Secondary Health Services

- Functions

1. To provide comprehensive medical, diagnostic and nursing services.

2. To train health workers.

3. To supervise clinical standards of health services throughout the province.

4. To provide advisory services and clinical supervision for all aspects of medical care within the region.

5. To provide specialist care.

6. To teach resident medical officers, medical registrars and nurses, and provide in-service training.

7. To support research.

Provincial hospitals have functions 1 through 3, and base hospitals have functions 1 through 7.

- Present Situation

1. Buildings

Most hospitals in Papua New Guinea were built between 1955 and 1965. Due to the lack of sufficient maintenance funds, most of them have deteriorated in quality. Also most of them require improvement to cope with increases in the number of outpatients as a result of increases in the nation's population.

In particular, the Department of Health has made public its view that it is urgently needed to resolve the problems confronting the following four hospitals.

Mt. Hagen Base Hospital

It is necessary to increase the number of beds from 250 to 400.

Angau Base Hospital

Although this hospital manages to fulfill its functions as a base hospital, its wooden buildings have become superannuated.

Port Moresby General Hospital

Efforts have been made to upgrade its buildings. The hospital's services are generally inefficient because its buildings are scattered on its premises. Recent rapid increase of outpatient cause functionally insufficient in outpatient and ward department.

Arawa Provincial Hospital

This hospital lags behind other provincial hospitals in operation and management of its buildings. The facilities of the Paediatric and Outpatient Departments are too small for the increased number of patients.

2. Staff Accommodation

It is necessary to construct lodging houses for staff (particularly for emergency staff) adjacent to hospital buildings in order to improve the quality of health care services.

3. Equipment

Operation and maintenance of the medical equipment, which is under control of the Department of Works, is not sufficient. Accordingly, it is necessary to expand the operation and maintenance functions. It is also necessary to secure regular supply of expendables.

4. Problems Related to the Use of Hospitals

There are still many patients who visit secondary health services facilities without a sound understanding of these facilities' functions. This has caused problems in sanitary conditions of hospitals and general hospital management.

5. Hospital Administration

There is a general shortage of human resources proficient in hospital management.

6. Staff Establishment

- The health care personnel system itself is outdated and cannot keep pace with the progress of health care services.

- Because of shortages of nursing officers, orderlies are acting also as nursing officers.

- With the exception of post graduate training for doctors and nurses, in-service training and continuing education for staff is limited.

- Under the present circumstances, it is difficult to dismiss recalcitrant employees.

7. Paramedical Services

- Due attention has not been paid to the improvement in paramedical services.

- This is particularly the case with the field of pathology services. No comprehensive development plan for examination has been established, with the only exception being the field of biochemistry.

- Laboratory services have not contributed even to the prevention of the most important and common disease in Papua New Guinea.

- Rudimentary or non-existent services have been provided for rehabilitation of inpatients. This is one of the main factors unnecessarily extending periods of hospitalization.

8. Hospital Records and Statistics

- Since no serious efforts have been made to make sure that detailed medical records are kept, medical facilities' records of both outpatients and inpatients are inaccurate. The recorded numbers of outpatients and inpatients are always smaller than the actual numbers.

- Records at reception offices are generally inaccurate. They are often rewritten by doctors and nurses.

- Records on inpatients' discharges are also inaccurate. It often happens that such a record is not written.

- Residents do not think of hospitals near their homes as "hospitals of their own." So it is difficult to secure their cooperation in improving hospital facilities.

(b) Goals of Secondary Health Services

The guideline on the secondary health services under the second National Health Plan 1986-90 is as shown below.

1. To provide a comprehensive hospital system in which essential nursing, diagnostic and specialist services are incorporated.

2. To achieve effective qualitative improvements in secondary health services to support the primary health services.

(c) Secondary Health Services Facilities and Their Functions

The Table 2-6 shows the facilities of Port Moresby General Hospital, base hospitals and provincial hospitals (level 1 and 2), and their respective functions.

Table 2-6 Definitions and Functions of PNG Hospitals

Classification	Hospitals	No. of Beds (1985)	Proper Authorities	Function
National Referral Hospital	Port Moresby General Hospital	817	Department of Health	1. Teaching Hospital 2. National Referral Hospital 3. Central pathology service and specialist medical services
Base Hospitals	Goroka	300	Provincial Health authorities	1. clinical advisory services and supervision 2. Specialist Medical care services 3. Medical staff training
	Angau	500		
	Mt. Hagen	212		
	Nonga	480		
Provincial Hospitals Level 1 (200~300Beds) Level 2 (less than 200beds)	Mendi	217	Provincial Health Authorities	1. Comprehensive medical, diagnostic and nursing services 2. Health workers training 3. Clinical standards supervision
	Arawa	250		
	Madang	400		
	Wewak	312		
	Kundiawa	200		
	Daru	110		
	Kerema	83		
	Alotau	100		
	Popondetta	150		
	Sopas	85		
	Vanimo	200		
	Kinbe	140		
	Lorengau	100		
	Kavieng	122		

(Source: National Health Plan 1986/90)

3) Present Situation of Tertiary Health Services

In Papua New Guinea tertiary health services programs are mostly implemented overseas. As the government's health policies attach utmost importance to primary health services, it is the intention of the government to maintain the current level as far as tertiary health services are concerned.

Certain patients who need to receive specialised treatment usually not available in the country are transferred to Australia on recommendation by a group of government doctors, including at least two medical specialists, to receive free specialised treatment there. In 1985, a total of 200,000 Kina was appropriated for this programme.

Most of these patients were transferred to Australia from Port Moresby General Hospital.

The present situation of each of the main fields of medical treatment in Papua New Guinea is as outlined below.

- Radiotherapy/Oncology

  There has been a delay in expanding the facilities of radiotherapy due to the fact that a relatively low weight is given to the treatment of cancers. Since 1985 when a radiotherapy ward was set up in Lae Provincial Hospital, radiotherapy has been provided by contract senior specialists. A programme for training radiotherapy specialists was initiated in 1982 with the assistance of Australia.

- Ophthalmology

  The following hospitals have ophthalmologists.

  - Port Moresby
  - Goroka
  - Madang
  - Rabaul

  These hospitals are relatively well equipped. It is said that the only need these hospitals must satisfy over the next five years or so is to secure suitable staff.

- Orthopedic Surgery

  There has been marked increase in orthopaedists' workload in keeping with the progress in motorization in the country. This trend is expected to continue in the future. The problem is that specialist general surgeons are usually performing orthopaedic

operations because there are so few orthopaedists. The country is dependent on Australia for training and dispatch of orthopaedists.

It is therefore necessary to secure employment of native orthopaedists and improve the facilities of orthopedic departments. Since 1985 a programme to train interns for orthopaedics has been implemented. Also, a programme is currently being worked out to invite Australian orthopaedists to conduct on-the-job training.

- ENT

  Only Port Moresby Hospital has an ENT specialist. Accordingly, it is urgently necessary to improve the facilities of the ENT Department and at the same time secure employment of a competent native ENT specialist.

- Cardiothoracic Surgery

  There are no cardiologists in Papua New Guinea. All heart surgical and cardiac surgical operations are performed by Australian surgeons at hospitals in Australia. A cardiologist from Royal Prince Alfred Hospital in Sydney periodically visits base hospitals to give guidance on the techniques of heart surgery and cardiac surgery.

- Neurosurgery

  Since there are no specialists in neurosurgery in Papua New Guinea, all neurosurgical operations are performed by Australian surgeons at hospitals in Australia, which has made neurosurgical operations very expensive. It is desirable that neurosurgical operations be performed by native specialists at hospitals in Papua New Guinea, but to date no effort along this line has been initiated.

- Plastic Surgery

  There is no plastic surgery specialist in Papua New Guinea. Since 1985 the Papua New Guinea Rotary clubs have been offering an annual plastic surgical service by Australian plastic surgeons.

- Dermatology

  Port Moresby General Hospital has a dermatologist, who is presently engaged in treatment and in training his staff.

2-2-2 Patterns of Diseases and Medical Treatment

(1) Patterns of Diseases

According to statistics (for 1985) on diseases in the Department of Health's hospitals, health centres and health subcentres, pneumonia, malaria and epidemic enteritis account for 34.5 percent of the total number of diseases, including delivery-related diseases and disorders. If the number of delivery-related diseases and disorders is excluded from the total number of diseases, then the above three diseases represent 43.2 percent of the total. They are followed by skin and subcutaneous diseases, muscle and bone structure diseases, anemia, bronchitis, emphysema and asthma. (see Table 2-7)

This pattern of diseases has remained essentially unchanged since 1971. It should be noted that there has been a rise in the rate pneumonia and malaria since 1971.

On the other hand, there were substantial improvements in basic health statistics, including life expectancy, the infant mortality rate and the child mortality rate, between 1971 and 1980 (see Table 2-8). This evidences that effective health care measures were taken during that period. Despite the substantial improvements in health statistics,

however, there has been no significant change in the pattern of diseases. There has been a marked increase in the number of cases of pneumonia, malaria and epidemic enteritis. Furthermore, there has been no significant decrease in the maternal mortality rate. In light of these facts, it is considered necessary to plan and implement a complete overhaul of the country's current health care measures.

Table 2-7 Pattern of Disease in 1971 and 1985

	1971			1985			Ratio 1985/1971
Population	2,490,000			3,343,000			1.34
Total Number of Diseases	170,865 ..... Ⓐ			206,622 ..... Ⓐ			1.21
Number of Obstetric causes	16,940 ..... Ⓑ			41,926 ..... Ⓑ			2.47
Ⓐ−Ⓑ	153,925		100%	164,696		100%	1.07
Pneumonia	1st	20,521	13.3%	1st	31,820	19.3%	1.55
Malaria	3rd	10,297	6.7%	2nd	22,804	13.8%	2.21
Diarrheal Diseases	2nd	15,905	10.3%	3rd	16,570	10.1%	1.04
Diseases of skin and subcutaneous tissue	5th	5,919	3.3%	4th	9,861	6.0%	1.67
Disease of mosukaskeletal system and connective tissues	7th	3,198	2.1%	5th	5,293	3.2%	1.66
Anaemias	8th	2,854	1.9%	6th	4,892	3.0%	1.71
Bronchitsi, chronic and unspecified emphysema and asthma	4th	9,874	6.4%	7th	4,791	3.9%	0.49

(Source: Handbook on Health Statistics 1985, National Health Plan 1986/90)

Table 2-8 Life Expectancy, Infant Mortality and Child Mortality Rates

	Life Expectancy (years old)		Infant Mortality rates per 1000 Live Births		Child Mortality rates per 1000 Live Birth	
	1971	1980	1971	1980	1971	1980
PNG Total	40.4	49.6	134	72	79	42
Western	38.5	47.7	129	83	82	49
Gulf	29.1	47.3	191	71	121	44
Central	43.7	51.3	85	59	56	34
N.C.D.	N/A	56.7	N/A	35	56	20
Milne Bay	43.0	57.1	98	50	61	25
Oro	42.3	49.2	94	67	62	40
S. Highlands	36.8	43.8	159	116	93	66
Enga	N/A	47.1	N/A	91	83	53
W. Highlands	40.5	51.9	153	81	83	42
Chimbu	43.3	50.2	149	87	77	47
E. Highlands	44.3	53.1	141	55	73	32
Morobe	42.7	50.9	123	62	71	37
Mandang	40.2	50.7	122	62	76	37
East Sepik	32.8	49.3	183	94	107	50
West Sepik	36.5	42.1	143	104	90	66
Manus	43.7	51.8	86	55	56	32
New Ireland	45.9	52.7	74	62	48	34
E. N. Britain	47.1	52.8	77	57	47	32
W. N. Britain	44.3	51.3	88	60	56	35
N. Solomons	46.9	59.6	83	33	50	17

N/A: Not available

(Source: Handbook on Health Statistics 1985)

Table 2-9 Leading Causes of Morbidity in Hospitals, Health Centres and Health Subcentres

ICD Code	Diseases Causes	Number of cases					Diseases Causes	Number of cases	
		1971.4~1972.3	1980	1981	1982	1983		1984	1985
16 20~29 42 52	Diarrhoeal Tuberculosis Measles Malaria	15,905 3,741 2,854 10,297	11,424 2,803 3,049 21,431	11,273 2,790 3,479 25,138	9,943 2,858 3,777 24,138	11,726 3,669 3,308 25,969	. Diarrhoeal . Tuberculosis . Measles . Malaria	14,710 3,669 2,449 24,897	16,570 3,102 1,752 22,804
190~193							Malignant neoplasm	2,119	1,797
200 321 323	Anaemias Pneumonia Bronchitis, chronic and unspecified emphysema and asthma	2,854 20,521 9,874	6,198 27,980 4,913	6,925 31,546 5,416	5,448 29,426 5,580	5,357 38,169 6,381	. Anaemias . Pneumonia . Bronchitis, chronic and unspecified emphysema and asthma	4,753 31,123 5,243	4,892 31,820 4,791
340~349							Diseases of other part of the digestive system	4,713	3,436
350~359 370~379	Disease of urinary system	5,440	5,847	6,407	6,307	6,744	. Disease of urinary system . Disease of female genital organs	2,247 4,932	4,574
380~389 390~399 410~411 419	Obstetric conditions	16,940	36,926	43,176	44,009	47,379	. Abortions . Obstetric conditions . Normal deliveries (incl. BBA)	2,693 6,077	2,347 5,063 34,516
420 429	Infant skin sub cataneous diseases	5,919	5,847	6,407	6,307	6,744	Diseases of skin and subcutaneous tissue	11,930	9,861
430~439 450~459 460~469	Disease of mosuloskeletal system and connective tissues	3,198	3,858	4,508	4,753	5,245	. Disease of mosuloskeletal system and connective tissues . Perinatal conditions . Ill-defined conditions	5,213 3,556 3,966	5,293 2,966 3,416
470~479 500~509 550 E560	Accidents, violence and pois.	17,917	15,937	18,600	19,783	19,694	. Fractures . Hemorrhage . Other injuries, early complications of trauma	4,136 4,831 2,960	3,524 3,953 2,692
	Others	55,405	45,270	54,965	50,244	52,825	Others	74,167	37,453
	Total of cases	170,865	191,584	219,259	213,553	234,712		220,284	206,622

(Source: Discharge statistics, Dept. of Health)

Table 2-9 shows that in 1985 pneumonia, postpartum disorders, epidemic enteritis, malaria, meningitis and tuberculosis were the main death causes. Infectious diseases, such as pneumonia, epidemic enteritis, malaria and tuberculosis, account for 22.0 percent of the total causes of death. Methods of treatment of these diseases are already well established and therefore it is relatively easy to cure these diseases.

From an epidemiological point of view, it is possible to prevent these diseases by improving sanitary conditions.

The number of deaths due to malnutrition, anemia, and postpartum disorders is 602, which represents 12.5 percent of the total number of deaths. But these causes of death are certain to go out of existence in the course of time if improvements are made in basic medicine and in the quality of life.

Fig. 2-2 show an international comparison of the patterns of main causes of death.

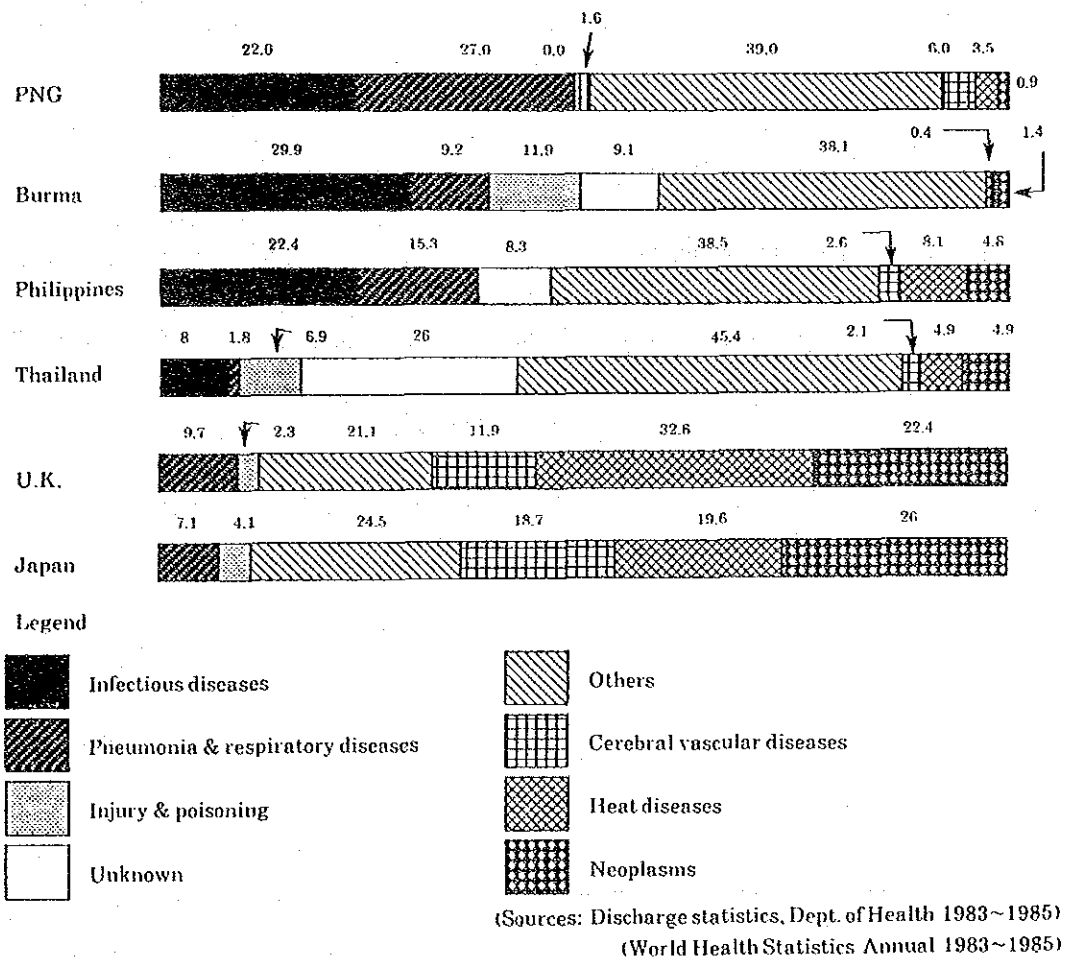

Fig. 2-2 International Comparison of Causes of Mortality

Table 2-10 Leading Causes and Number of Deaths in Hospitals, Health Centres and Health Subcentres

ICDCode	Diseases Causes	Number of cases					Diseases Causes	Number of cases	
		1971.4~1972.3	1980	1981	1982	1983		1984	1985
16	Diarrhoeal diseases	357	148	166	133	222	Diarrhoeal diseases	304	410
20~29	Tuberculosis	137	211	171	186	299	Tuberculosis	272	233
38	Septicaemia	N/A	81	139	112	155	Septicaemia		157
41							Measles	47	45
52	Malaria	100	251	354	344	421	Malaria	344	368
80 95 149	Malignant neoplasm	184	131	133	155	179	Malignant neoplasm		41
190~193 197	Malnutrition	119	62	74	84	76	Malnutrition	93	118
200	Anaemias	46	94	141	81	132	Anaemias	58	111
220	Meningitis	144	233	275	249	271	Meningitis		294
250 280~289	Diseases of heat	80	261	228	202	200	Disease of pulmonary circulation and other forms of heat disease		168
321	Pneumonia	321	896	1095	843	1292	Pneumonia	976	1154
323 325 340~349 351~359 370~379 380~389							. Bronchitis, chronic and unspecified emphysema and asthma . Other chronic obstructive pulmonary diseases . Diseases of other part of the digestive system . Disease of urinary system . Disease of female genital organs . Abortions	72 154 63 13 3	85 54 132 52
390~399 410~411 419	Normal deliveries	55	78	87	134	110	Obstetric deaths Normal deliveries	86	58 51
420~429 430~439							Skin, Subcutaneous musculoskeletal System	13 6	
460~469							Ill fedined	77	75
470~479 500~509 550 569	Accident poisoning	136	144	163	132	189	Fractures Blood Vessels Injuries	15 4 8	
	Others	1020	830	864	800	992	Others	1405	764
	Total of cases	3327	3636	4227	3839	4940		4464	4802

(Source: Discharge statistics, Dept. of Health)

(2) Pattern of Medical Treatment

1) Number of Beds, Hospitalization, Operations, Deliveries and Medical Equipment

The pattern of medical treatment in Papua New Guinea is characterised by the huge weight given to primary health care. It is presumed that the Government of Papua New Guinea succeeded in expanding the nation's primary health care services by increasing the number of health centres, sub health subcentres and aid posts under its first National

Health Plan 1974-78. In 1985, 96 percent of the nation's total population were able to reach medical care facilities within two hours. Of these facilities, the health centres and health subcentres have facilities for inpatients. There are now a total of 460 of them. In terms of the number of beds, they have a combined total of 8,782 beds, which compares with a total of 4,778 beds installed in hospitals. In terms of numbers of inpatients, operations and deliveries, they recorded 136,708 inpatients, 1,343 operations and 20,806 deliveries in 1985, which compared with 83,034 inpatients, 1,195 operations and 21,290 deliveries recorded in hospitals in the same year. In terms of numbers of doctors, medical laboratory technicians and pharmacists, however, they have a combined total of 44 doctors (no medical laboratory technicians or pharmacists), which compares with combined totals of 183 doctors, 47 medical laboratory technicians and 26 pharmacists working at hospitals.

Although the health centres and health subcentres are equipped with a very large number of beds, they are managed mostly by health extension officers, nursing officers and nurse aid. There is a clear difference in quality of medical care services between these institutions and hospitals.

Table 2-11 No. of Beds by Province and Medical Facilities 1985

	Citizen Population	Hospitals		Health Centre		Health Sub Centre		Population/Bed	
		No. of Hosp.	No. of Beds	No. of Centres	No. of Beds	No. of Centres	No. of Beds	Per Hospital Bed	Per Beds
Western	89,400	1	110	11	276	19	84	813	190
Gulf	70,300	1	83	9	380	8	56	847	135
Central	129,900	0	0	8	335	23	138	-	275
NCD	136,800	1	817	0	0	0	0	167	167
Milne Bay	146,500	1	100	8	199	26	145	1465	330
Oro	88,000	1	150	5	120	11	55	587	271
S. Highlands	255,300	1	217	13	573	24	258	1176	244
Enga	176,300	1	85	10	571	9	133	2074	223
W. Highlands	294,200	1	212	11	278	8	36	1388	559
Chimbu	185,200	1	200	7	289	12	95	926	317
E. Highlands	300,800	1	300	7	130	22	321	1003	401
Morobe	348,200	1	500	17	589	7	42	696	308
Madang	239,400	1	400	19	724	8	60	599	202
East Sepik	249,000	1	312	12	357	20	114	798	318
West Sepik	125,800	1	200	10	446	18	100	629	169
Manas	29,100	1	100	7	108	0	0	291	140
New Ireland	75,100	1	122	8	389	15	36	616	137
East New Briten	150,000	1	480	11	344	11	72	313	167
West New Briten	104,300	1	140	9	339	11	66	745	191
N. Solomons	149,400	1	250	8	428	18	96	598	193
Total	3,343,000.	19	4,778	190	6,875	270	1,907	700	247

Table 2-12 No. of Inpatients, Operations and Deliveries in Hospitals, 1984

Province	Hospital	Beds	Inpatient	Operation	Nomal Deliveries	Unusual Deliveries	Total Deliveries
Western	Daru	110	874	23	270	13	283
Gulf	Kerema	83	951	10	151	29	180
Nat. Capital	PMGH	817	13,885	312	3,852	883	4,735
Milne Bay	Alotau	100	1,519	26	311	96	407
Oro	Popondetta	150	3,595	17	484	126	610
S. Highlands	Mendi	217	3,338	40	574	90	664
Enga	Sopas	85	N/A	N/A	N/A	N/A	N/A
W. Highlands	Mt. Hagen	212	6,539	78	1,313	132	1,445
Simbu	Kundiawa	200	5,034	140	805	98	903
E. Highlands	Goroka	300	9,691	129	1,580	404	1,984
Morobe	Angau	500	8,307	93	2,474	188	2,662
Madang	Madang	400	3,636	31	1,174	10	1,277
East Sepik	Wewak	312	6,437	51	1,114	141	1,255
West Sepik	Vanimo	200	1,154	11	181	44	225
Manus	Lorengau	100	1,376	13	294	38	332
New Ireland	Kovieng	122	1,939	18	480	41	521
East New Briten	Nonga	480	6,757	87	1,339	359	1,698
West New Briten	Kimbe	140	2,425	31	480	64	544
N. Solomons	Arawa	250	5,577	85	1,288	277	1,565
	Total	4,778	83,034	1,195	18,164	3,126	21,290

N/A (Not available)

(Source: Department of Health)

Table 2-13 No. of Inpatients, Operations and Deliveries in Health Centre and Health Subcentre, 1985

	Beds	Inpatient	Operation	Nomal Deliveries	Unusual Deliveries	Total Deliveries
Western	360	3,785	39	620	74	694
Gulf	436	4,524	30	481	99	580
Central	473	3,104	63	533	66	599
Nat. Capital	0	-	-	-	-	-
Milne Bay	344	3,644	28	387	63	450
Oro	175	2,709	27	279	55	334
S. Highlands	831	16,005	172	2,224	331	2,555
Enga	704	9,802	141	914	266	1,180
W. Highlands	314	11,381	157	943	387	1,330
Simbu	384	12,300	82	1,190	275	1,465
E. Highlands	451	9,876	75	1,219	211	1,430
Morobe	631	5,385	63	766	118	884
Madang	784	11,703	101	1,523	176	1,699
East Sepik	471	11,913	57	681	133	814
West Sepik	546	885	84	489	162	651
Manus	108	777	3	89	8	97
New Ireland	425	5,697	30	1,054	76	1,130
East New Briten	416	13,001	93	2,512	338	2,250
West New Briten	405	7,034	58	1,375	70	1,445
N. Solomons	524	3,183	40	587	32	619
Total	8,782	136,708	1,343	17,866	2,940	20,806

(Source: Department of Health)

Table 2-14 Medical Staffing of Governmental Hospitals, 1985

Province	Hospital	Med. Off.	Nurs Off.	Nurs Aids	HEO	Hosp Ord.	Dent Off	Dent Thre	Med Tech	Med. Lab. Tech	Med. Lab. Asst.	Radi Grap	Disp.
Western	Daru	2	21	15	1	0	0	0	0	0	4	0	0
Gulf	Kerema	3	17	10	1	7	0	0	0	0	2	1	1
Central N.C.D.	PMGH	62	210	84	2	49	3	7	5	27	3	12	5
Milne Bay	Alotau	4	29	11	0	0	1	0	1	2	2	0	1
Oro	Popondetta	5	30	24	0	19	1	0	0	1	1	1	1
S. Highlands	Mendi	5	29	17	0	9	1	4	0	1	1	1	1
Enga	Sopasu												
W. Highlands	Mt. Hagen	11	53	43	0	1	0	0	0	1	3	1	1
Chimbu	Kundiawa	4	51	29	0	25	1	1	0	1	4	0	0
E. Highlands	Goroka	15	101	103	0	0	1	2	0	2	5	2	2
Morobe	Angau	22	136	136	0	52	1	5	1	5	6	2	4
Madang	Madang	11	80	73	1	0	1	7	0	2	3	2	2
East Sepik	Wewak	8	68	46	2	0	1	6	0	2	3	3	2
West Sepik	Vanimo	2	18	11	0	4	0	0	0	0	2	0	2
Manus	Lorengau	2	19	23	0	23	0	0	0	0	3	0	0
New Ireland	Kavieng	3	9	15	0	6	1	0	0	1	2	0	1
E. New Briten	Nonga	13	80	49	1	22	1	0	1	2	6	3	2
W. New Briten	Kimbe		26	29	0	3	0	0	0	1	3	1	1
N. Solomons	Arawa	5	63	59	0	3	1	0	1	0	0	0	0
Total		182	1060	777	8	223	14	32	9	47	53	28	26

Note: Sopas Hospital is under a church health service (CHS). (Source: Handbook on Health Statistics, 1985)

Table 2-15 Medical Staffing in Governmental Primary Health Care Facilities, 1985

Province	Med. Off.	Nursing Off.	Nurse Aid	H.E.O.	H.I.	Aid Post Ordary	Hospital Ordary	Dent. Ther
Western	1	16	9	9	5	65	37	4
Gulf	0	20	16	13	5	33	26	2
Central	0	36	10	13	6	85	7	4
N.C.D.	2	80	56	3	0	0	0	0
Milne Bay	1	39	22	13	7	85	74	7
Oro	1	27	15	10	4	81	28	12
S. Highlands	3	49	74	19	6	194	42	0
Enga	2	58	36	17	6	154	62	2
W. Highlands	0	36	27	13	9	155	28	6
Chimbu	0	22	33	12	5	116	10	1
E. Highlands	2	35	76	23	9	142	0	6
Morobe	2	62	26	34	10	244	77	0
Madang	0	44	63	15	8	159	0	0
East Sepik	3	78	38	15	7	121	90	0
West Sepik	1	24	38	16	6	102	25	1
Manus	1	12	11	8	2	27	0	1
New Ireland	1	26	25	15	4	50	20	8
E. New Briten	1	19	6	12	10	61	0	6
W. New Briten	1	21	19	14	8	55	15	5
N. Solomons	1	58	27	12	8	80	0	0
Total	23	762	627	286	125	1999	541	65

(Source: Dept. of Health Handbook 1985)

Table 2-16 Medical Staffing in Church Health Service Facilities, 1984

Provinces	Med. Off.	Nursing Off.	Nurse Aide	H.E.O.	A.P.O.
Western	2	47	32	0	12
Gulf	2	29	32	2	14
Central	1	32	27	0	1
N.C.D.	0	1	0	0	0
Milne Bay	1	57	59	0	6
Oro	0	13	13	0	2
S. Highland	0	55	59	0	20
Enga	1	29	24	0	0
W. Highlands	4	38	36	0	15
Chimbu	0	16	19	0	1
E. Higlands	0	24	23	1	8
Morobe	3	20	33	0	10
Mandag	0	42	30	3	10
E. Sepik	0	34	33	0	2
W. Sepik	1	47	48	1	3
Manus	0	7	7	0	0
New Ireland	1	37	16	0	0
East New Briten	5	50	44	0	0
West New Briten	0	34	23	0	3
N. Solomons	1	29	16	0	2
Total	22	641	574	7	109

(Source: Church Health Services Review, 1984)

Table 2-17 Medical Specialists by Province, 1984

Provinces	Phys	Paed	Obst	Surg	Oral Surg	Opht	ENT	Dema	Psyc	Anae	Radi	Path	Haem	Total
Western														0
Gulf														0
Central														0
N.C.D.	*3	2	1	3	1	1	1	1	1	1	*	1	1	17
Milne Bay														0
Oro														0
S. Highlands		*												0
Enga														0
W. Highlands		1	1	2										4
Chimbu		*												0
E. Highlands	1	1	1	2		1				1		1		8
Morobe	1	2	1	2						1				7
Madang	1	1	1	1		1				1				6
E. Sepik	1	1		1										3
W. Sepik														0
Manus														0
New Ireland														0
E. New Briten	1	1	*	1						1				4
W. New Briten														0
N. Solomons														1
Total	8	9	5	13	1	3	1	1	1	5	0	2	1	50

* = 1 position vacant

(Source: Dept. of Health)

2) Length of Hospitalization

The average numbers of days of hospitalization for main diseases as of 1984 (see Table 2-18) are 8.3 for pneumonia (14.5), 6.5 for epidemic enteritis (7.6), 8.8 for bronchitis (11.1), 10.2 for anemia (17.6), 32.7 for tuberculosis (120.6) and 6.5 for childbirth (6.8) (figures in parentheses denote the numbers of days of hospitalization for the same diseases in Japan in 1984). The figures for Japan are all mean values for the 15-35 age group (patients in this age group are said to stay at hospitals for the shortest periods). In this context, the length of hospitalization is generally very limited in Papua New Guinea. The Government of Papua New Guinea changed many special hospitals for tuberculosis treatment, where the numbers of days of hospitalization tend to be long, into health centres in view of serious shortages of beds. Furthermore, it has been implementing policy measures to make long-stay inpatients receive treatment at their homes or nearby health centres or health subcentres. For example, tuberculosis patients need to receive treatment for 18 months on the average. They receive hospital treatment for two months at the longest. After that they continue to receive treatment as outpatients, receiving their medicines twice a week. In the case of leprosy, too, the average number of days of hospitalization, which had been 252 in the 1968-72 period, was reduced to 37.2 in 1985. This was realised mainly by having many of the leprosy inpatients continue to receive treatment as outpatients. As a result, there has been a marked increase in the number of outpatients.

Table 2-18 Average Number of Days in Hopsital by Leading Cause

(Unit: days)

	Diseases Causes	1984			1985		
		Central Province	N.C.D.	All Province	Central Province	N.C.D.	All Province
Medicine	Pneumonia	6.2	7.0	8.3	6.4	6.3	7.9
	Gastro-Enteritis	5.5	5.2	6.5	4.9	5.5	6.8
	Malaria	4.1	4.8	6.8	3.9	5.8	6.4
	Bronchitis	6.9	4.9	8.8	6.4	7.2	9.2
	Skin Intection	6.4	5.6	9.4	7.2	5.7	8.9
	Other Skin Diseases & Subcut.	9.3	12.6	11.6	10.1	13.0	13.5
	Acute Respiratory Infection	6.4	6.5	8.0	6.6	4.3	7.5
	Anemias	11.1	7.7	10.2	8.6	8.6	9.6
	Measles	5.1	5.2	8.1	10.2	5.4	6.4
	Whooping Cough	9.0	8.4	10.3	7.0	6.0	9.2
	Mal-nutrition	13.4	15.0	19.8	13.3	14.7	20.9
	Accidental Poisoning	3.3	2.9	2.7	4.8	2.6	2.6
	Tuberculosis	28.2	31.7	32.7	14.3	29.5	31.7
	Leprosy	23.3	4.0	35.9	8.5	15.5	37.2
	S.T.D.	6.5	9.5	10.9	13.6	8.8	13.8
Obstetric	Normal Deliveries	3.5	3.1	6.5	3.8	2.7	6.5
	Child Birth Complication	3.4	6.2	9.1	7.3	5.2	8.8
Surgery	Car Accident	7.8	11.8	7.7	1.0	12.8	7.4
	Accidental Fall	7.0	4.9	8.6	1.0	1.0	6.5
	Fire Accident	8.9	4.2	15.1	18.2	14.1	16.0
	Industrial Type Accident	1.9	4.0	5.7	2.2	3.5	4.9
	Other Accidents	0	0	0	0	0	0
	Others	5.8	8.0	9.6	6.1	7.2	9.5

(Source: Handbook on Health Statistics)

3) International Comparison of Health Care

In an attempt to provide objective data on the health services in Papua New Guinea, an international comparison was made of the numbers of beds, doctors, pharmacists and nurses. (see Table 2-19)

Also, in an international comparison of the numbers per 10,000 persons of beds, doctors, pharmacists and nurses (see Fig. 2-3), the number of beds is 14.29 for Papua New Guinea, which compares with 58.6 to 148.1 for major industrial nations. The number of doctors is 0.55 for Papua New Guinea, which compares with 14.9 to 22.6 for major industrial nations.

Table 2-19 International Comparison of Medical Service Levels

	Population (thousand)	Bed (bed/doctor)	Doctor	Pharmacist	Nurse	Year
Papua New Guinea	3,343	4,778 (26.0)	184	26	1,118	1985
Burma	36,392	26,019 (2.6)	10,031	69	5,560	1985
Philippines	50,740	93,474 (12.7)	7,378 G	995 G	9,644 G	1981
India	676,220	540,768 (2.0)	268,712 R	155,621 R	150,339 R	1981
Sri Lanka	15,190	44,029 (22.4)	1,964 G	449 G	7,040 G	1981
Thailand	48,490	71,718 (10.4)	6,867	2,650	28,339	1980
West Germany	61,638	707,710 (5.1)	139,431	44,744	334,282	1980
Sweden	8,330	123,074 (6.7)	18,300	7,460	76,330	1980
U.S.A.	231,534	1,333,360 (3.2)	414,916	144,260	1,514,000	1980
Japan	118,008	1,757,309 (9.8)	179,358	108,806	590,177	1984

G: Public Officials R: Registered (Source: World Health Statistics Annual 1983)

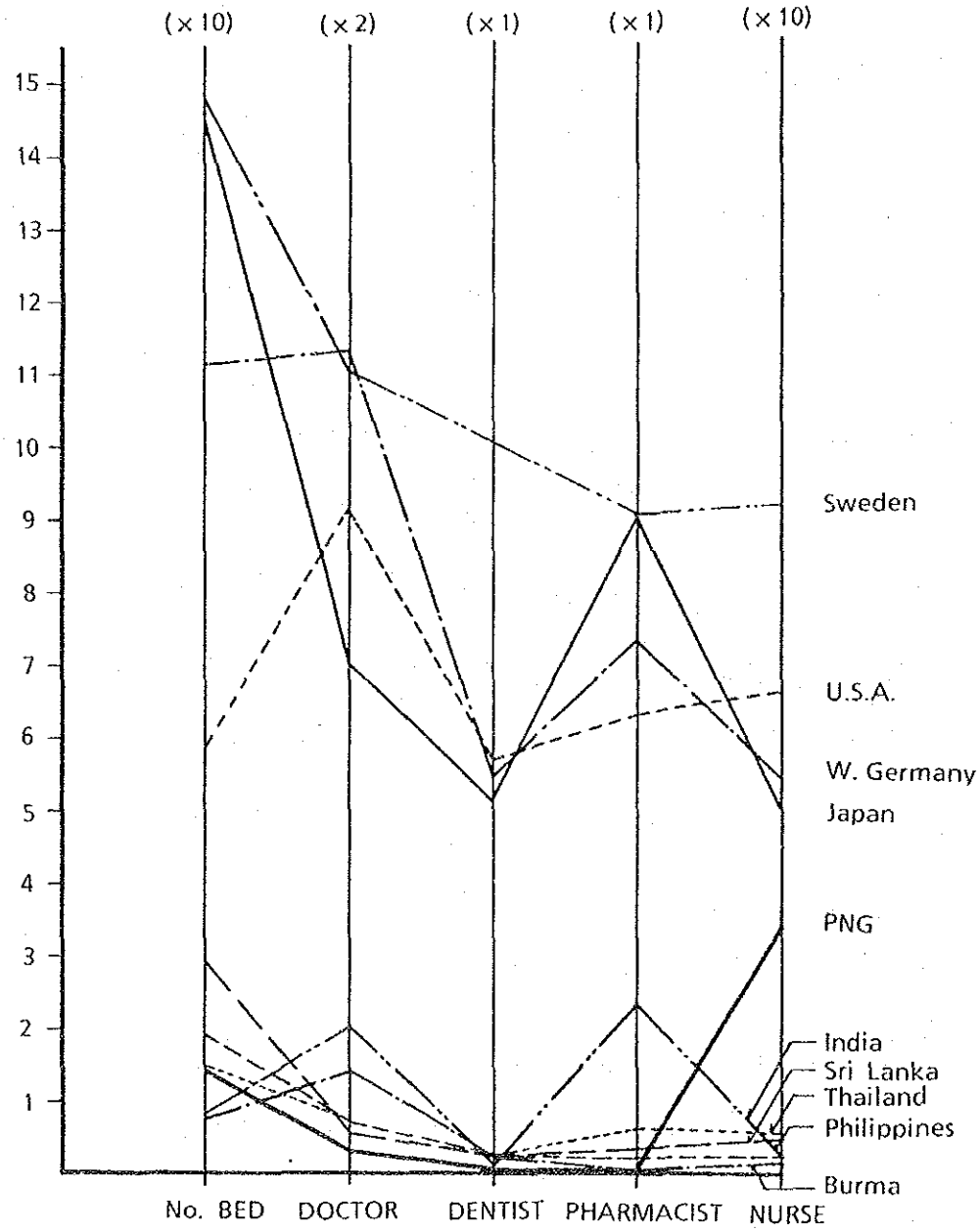

Fig. 2-3 International Comparison of Medical Staff

2-2-3 Present Situation of Administration of Health Services

In Papua New Guinea, the Department of Health is responsible for national-level administration of health services, and the Division of Health of the provincial government for provincial-level administration of health services. On the other hand, the Department of Works is responsible for maintenance of buildings and equipment. Medicines and medical equipment are supplied to each government and church health facilities by the pharmaceutical services section of the Department of Health.

(1) Organisation of the Department of Health

The present organisation, approved by the Public Services Commission, came into effect in March 1985.

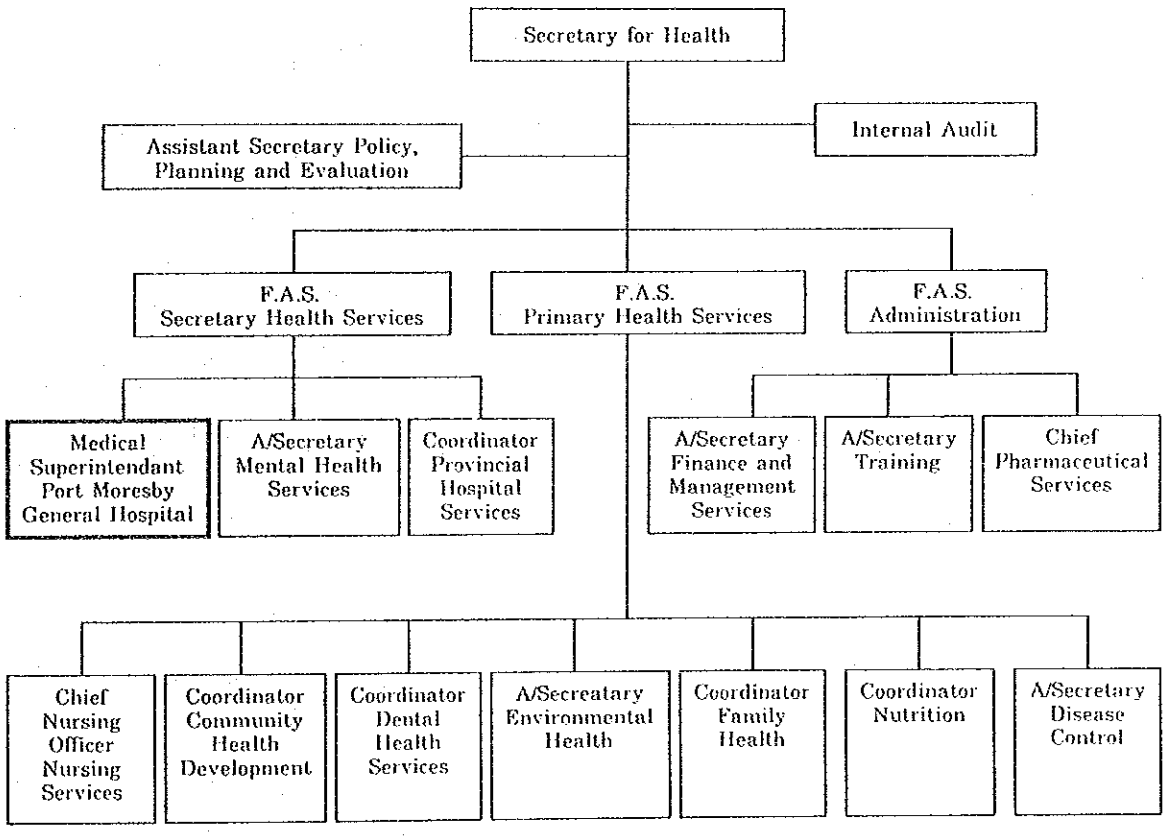

Fig. 2-4 Organisational Structure of the Department of Health

(2) Organisation of Health Structure for Provincial Government

Each of the 19 provinces in Papua New Guinea has its own government. Although there are some differences in organisation from one province to another, the organisation of health structure of a provincial government can be illustrated as below.

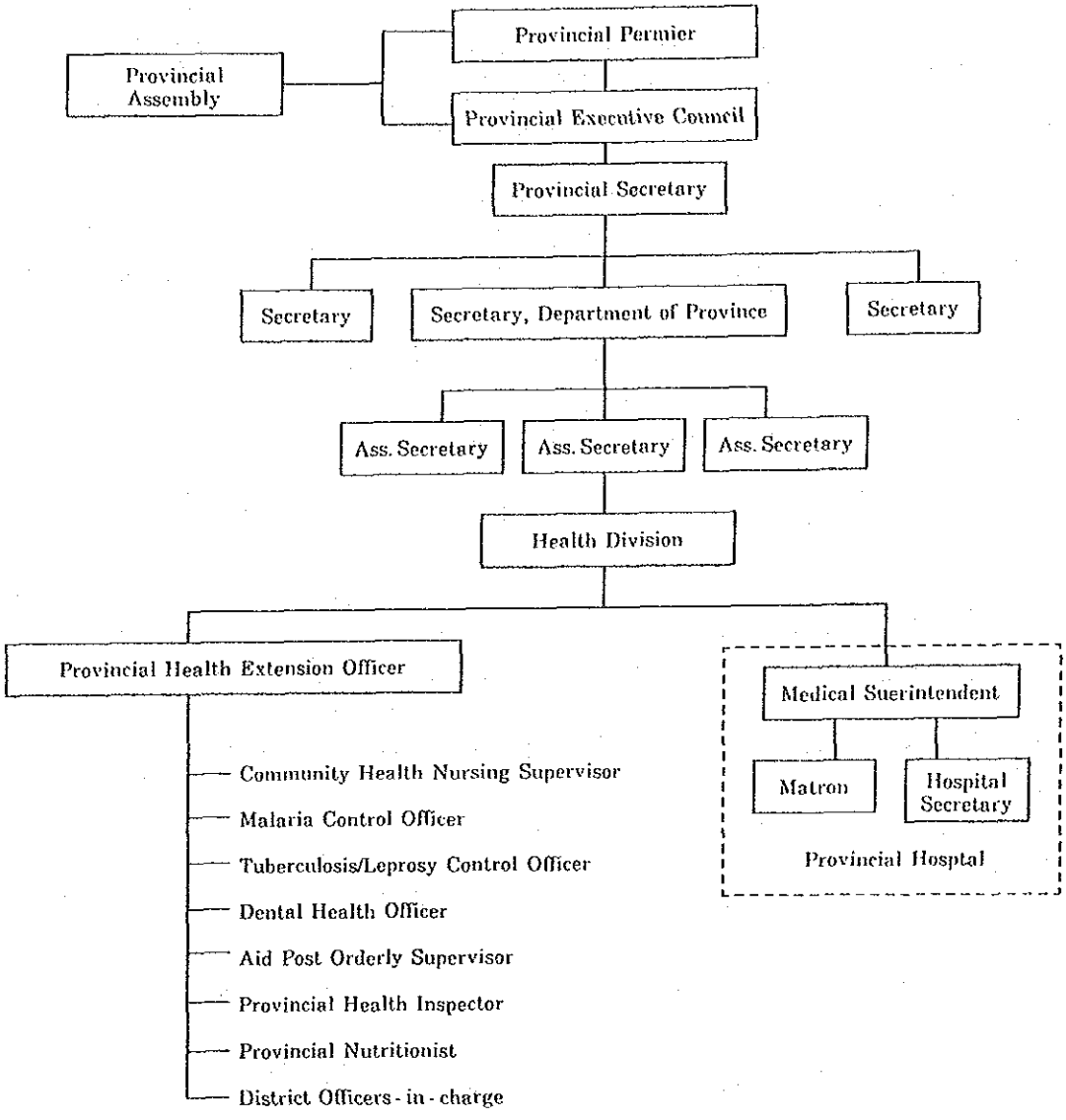

Fig. 2-5 Organisational Structure of Provincial Government, Showing Division of Health Structure

(3) System for Supply of Medicines and Medical Equipment

The pharmaceutical services section of the Department of Health is providing government-run health services facilities, as well as church-operated health services facilities, with medicines and medical equipment which it procures at home and abroad independent of other government procurement organisations. In addition, the section is responsible for operation of hospital pharmacies at PMGH, the four base hospitals and the artificial limb factory, the preparation and implementation of legislation controlling poisons and dangerous substances, therapeutic standards, the practice of pharmacy and so on.

The main functions of the Pharmaceutical Services Section and the flow of supply of medicines by the section are illustrated in the diagramme below.

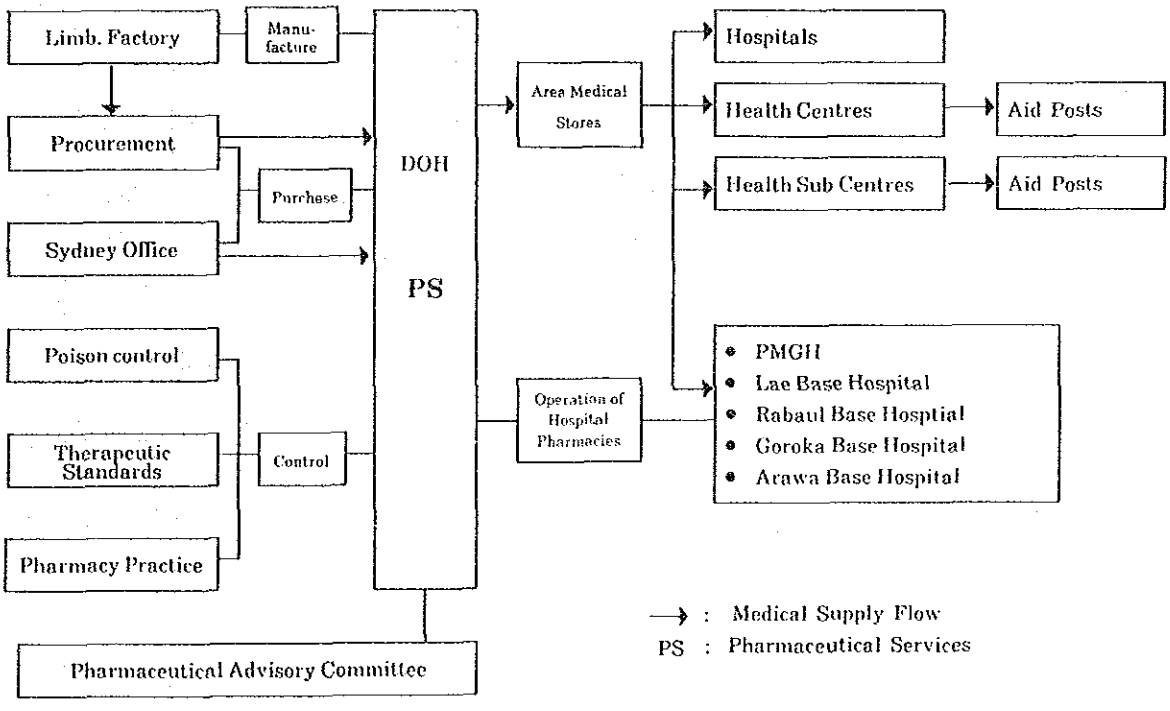

Fig. 2-6 Function of the Pharmaceutical Services and Medical Supply Flow Chart

(4) System for Operation and Maintenance of Hospital and Medical Equipment

The main functions of the Department of Works include implementation of government projects and procurement, and management and maintenance of government-run factories, automobiles and equipment (other than activities by such government bodies as the Electricity Commission, NBS and PTC). The Construction Branch of the Biomedical Engineering Section in the Department of Works is responsible for operation and maintenance of health services facilities and their equipment.

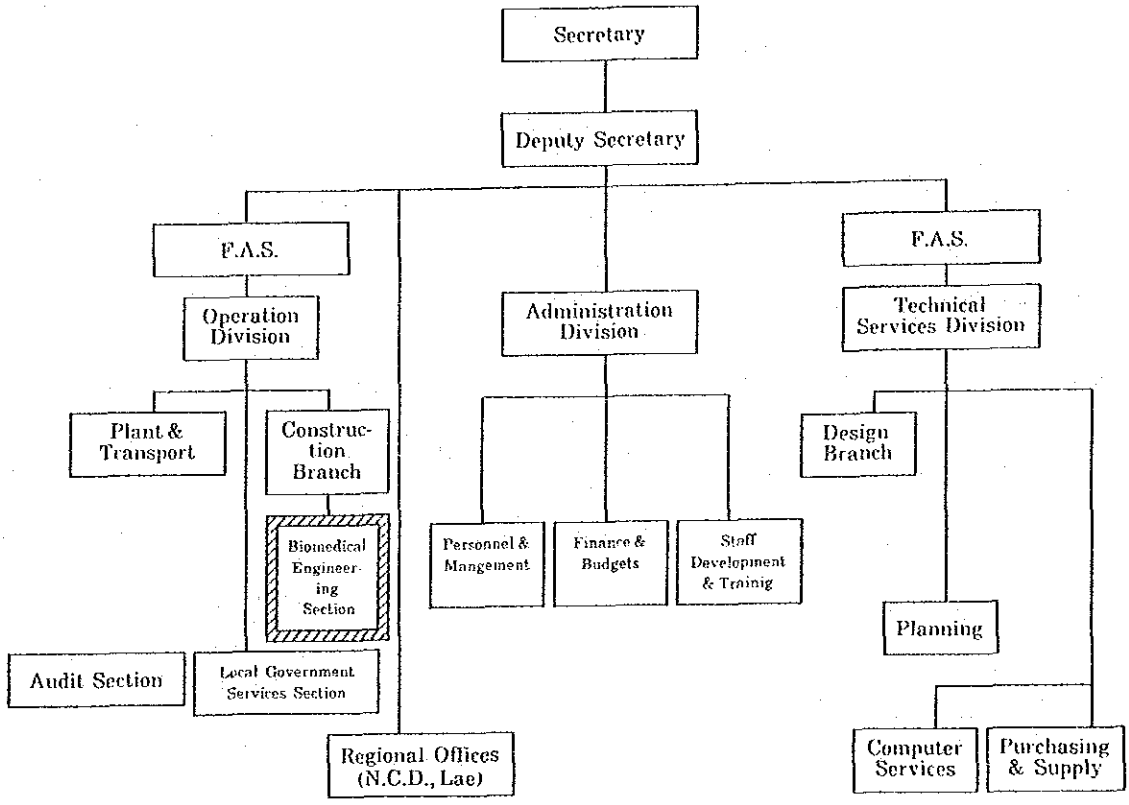

Fig. 2-7 DOW Headquarters Organisation

2-2-4 Medical Education and Training

(1) Medical Education

In Papua New Guinea medical education is given at the University of Papua New Guinea, and the College of Allied Health Sciences in Port Moresby and Madang, with the former training students for medical or dental care and the latter training students for paramedical staffs.

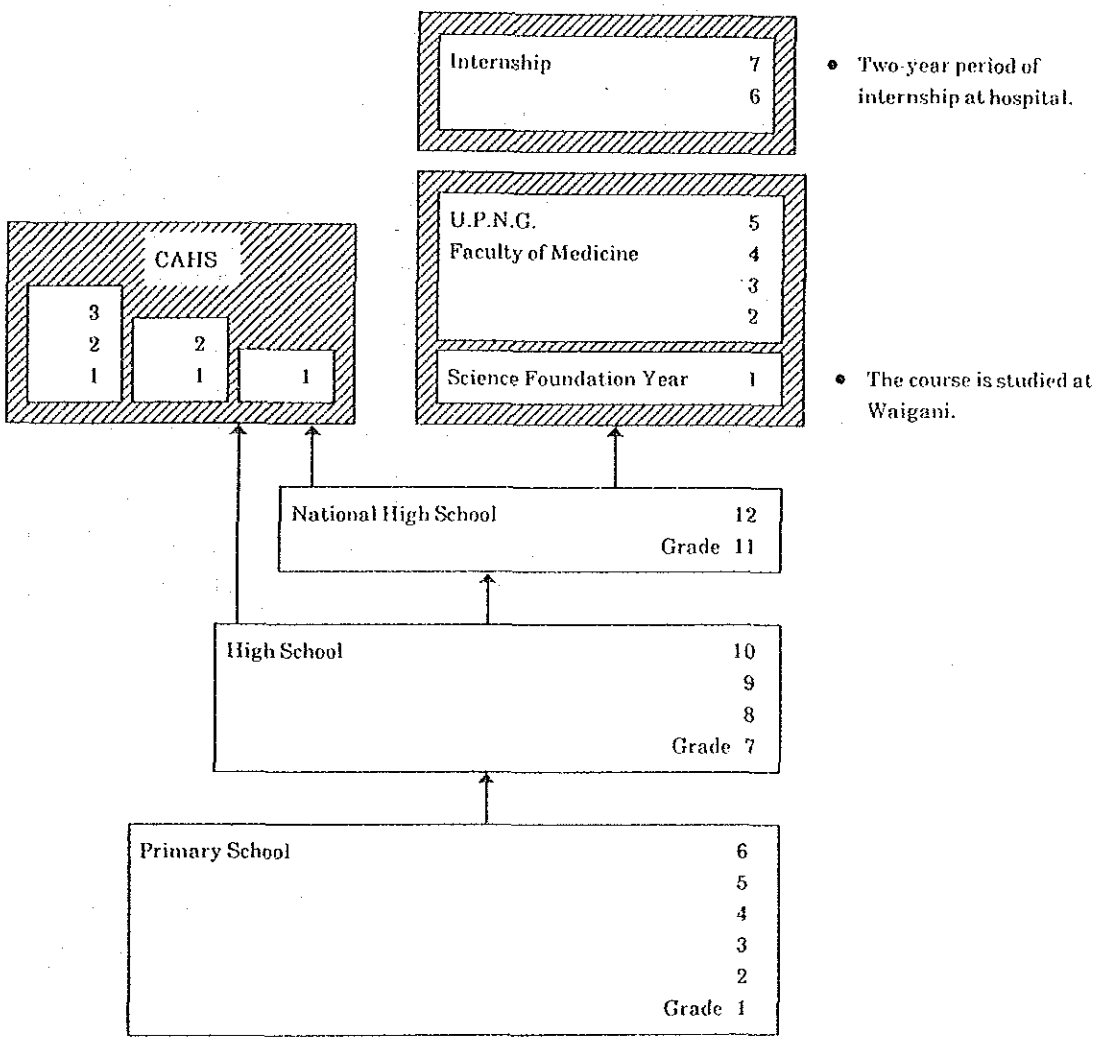

Fig. 2-8 Medical Education System in PNG

Table 2-20 Number of Papua New Guinean Graduates

		Qualification	Term of Education	No. of Graduates			
				1982	1983	1984	No. of total Graduates as of 1984
UPNG Bachelor Course	Dental Surgery	G12	4	2	0	3	8
	Medical Science	G12	4	1	0	0	2
	Medicine, Surgery	G12	5	23	13	8	145
UPNG Master Course	Medicine			1	0	2	6
	Surgery				3	0	3
UPNG Postgraduate Diploma Course	Child Health			2	0	0	10
	O & G			1	0	0	4
	Opthalmology			2	0	0	2
CAHS Port Moresby	Rediography	G12	3	2	4	1	45
	Lab. Technician	G12	3	16	8	4	113
	Midwifery	G10	1			8	8
	OT Management	G10	1			2	2
	Pediatric	G10	1			7	7
	Dispenser	G12	3	2	4	0	46
	Lab. Assistant		2	0	0	9	70
	Nursing Administraton		1	0		18	70
	Nursing Education		1	0	5	6	66
	Nutrition Education	G10	1	0	10	0	36
CASH Madang	Malaria Control	G10	0.5	36	40	85	700
	HEO	G10	3	26	23	20	469
	HI	G10	3	23	0	9	216

(Source: Commission for Higher Education)

G : Grade
HEO : Health Extension Officer
HI : Health Inspector

The conceptual drawing (Fig.2-8) illustrates the outline of medical education system in Papua New Guinea, and Table 2-20 lists graduates of these medical educational institutions (as of 1984).

1) Medical Officers

In 1984, 73 percent of national graduates were employed by government-run or church-operated health services facilities. Private practice doctors accounted for 13.1 percent, defence force 7.6 percent, and 6.3 percent, though employed, were on study leave. Population per one medical officer was 11,700 in 1974 and 11,400 in 1984. The ratio of native medical officers in government-run and church-operated health services facilities has been increasing year by year, 19 percent in 1974, 28.8 percent in 1979, and 51.2 percent in 1984.

In 1986, the total number of native medical officers was 93, but a programme is now being carried out to increase it to 180 by the year 2000. The objective of the government's medical human resource development programme is to strike a fair balance between primary and secondary health services.

The government defines the duties of medical officers as follows:

- To provide guidance and advice on provincial-level primary health services and conduct professional training.

- To engage in medical treatment at provincial hospitals.

2) Dental Officers

From 1970 to 1972, a total of 13 dental officers graduated from the Dental College. In 1973, the Dental College was merged into the University of Papua New Guinea (UPNG). Between 1981 and 1985 a total of 8 dental officers graduated form UPNG. It is the intention of the national government to secure at least five gradates of UPNG every year so that at least one dental officer is stationed in every province.

3) Pathology staff and Radiography staff

The national government intends to increase, by the year 2000, the number of medical laboratory technicians by 35 percent, assistant medical laboratory technicians by 41 percent, and radiography technicians by 43 percent from the number of the year 1985.

4) Health Extension Officers and Health Inspectors

The national government aims to increase the number of the health extension officers (HEO) to 500 by the year 2000, because of its belief that the key to the success of health services lies in the advancement of comprehensive health services provided by HEO.

Table 2-21 Employment of Health Extension Officers, 1985

Rural Health Services	286
Hospitals	8
Church Health Service	7
DOH	99
Training	22
Defence Force	5
Total	337

(Source: DOH)

The health inspectors (HI) are health specialists engaged in improvement of environmental health conditions in communities and occupational conditions in the work place. The number of HI employed by DOH and provincial health offices were 77 at the year 1985. The DOH and provincial health offices have to secure a combined total of 190 HI by the year 2000.

Table 2-22 Employment of Health Inspectors, 1985

Provincial Health Offices	66
District Health Centres	59
Local Authorities	35
CAHS Madang	7
DOH	11
Private	1
Defence Force	3
Total	182

(Source: DOH)

Table 2-23 College of Allied Health Sciences by Course and Location, 1985

CAHS Port Moresby	Diplomas Course • Nursing Administration • Nursing Education • Medical Technology P/Basic Course • Midwifery • Paediatric Nursing • Operating Theatre Management Dispenser Course Laboratory Assistant Course Laboratory Technician Course
CAHS Madang	Health Extension Officer Course Health Inspector Course

(Source: Training Branch Annual Report)

(2) Nursing Officers and Base Level Health Workers

Institutions for training prospective nursing officers and base level health workers are operated by the national government and churches. Training courses are offered at the institutions listed in Table 2-24 (as of 1985).

Table 2-24 Training Schools for Nursing Officers and Base Level Health Workers, 1985

	Government	Church	
Nursing Schools	Goroka (EHP) Arawa (NSP) Mendi (SHP) Rabaul (ENBP) Wewak (ESP)	Balimo Sopas Dogura Kudjip Madang	Vunapope Lemakot
Aid Post Orderly Schools	Butuwin (ENBP) Togoba (WHP)	Braun Oro Gaubin	Kapuna Rumginae Raihu
Nurse Aid Schools	Lae Goroka Kundiawa	Kapuna Beifa'a Tinsley	Vunapope

(Source: Training Branch Annual Report)

1) Nursing Officers

Nursing officers are engaged in the care of patients in hospitals, diagnostic and therapeutic work in outpatients departments, urban clinics and health centres, as well as child and mother health services.

Between 1976 and 1984 a total of 706 trainees graduated from government and church schools, with nearly 50 percent of them being graduates of church-operated nurses' schools. In 1973 a total of 1,554 nursing officers belonged to the government and churches, of which 741 were expatriates. In 1985, however, the total number increased to 2,514 and the ratio of expatriates to the total number decreased remarkably. Of them, 1,060 (42.2 percent) were working in hospitals, 1,403 (55.8 percent) in health centres, health subcentres and provincial offices, and 51 (2 percent) at the Department of Health and various training institutions.

Prospective nursing officers are trained at government or church nursing schools. They receive professional training for three years.

The national government intends to increase the total number of nursing officers to 3,085 by the year 2000 by increasing the number of persons enrolling at these schools and the number of students graduating from these schools.

In order to secure the required total number of nursing officers in the year 2000, it is necessary to increase their total number by 19.3 percent from the figure of 1985. (see Table 2-25)

Table 2-25 Requirements for Nursing Officers in 2000

	1985	2000	Increase
Rural areas	1,403	1,753	25%
Hospitals	1,060	1,166	10%
Training	51	81	59%
Total	2,514	3,000	19%

(Source: National Health Plan 1986/90)

2) Nurse Aides, Aid Post Orderlies and Hospital Orderlies

The practical nurses are engaged in nursing services in hospitals and community health services. In 1985 there were a total of 1,978 nurse aides, of whom 60 percent were engaged in rural health institutions and 40 percent were working in hospitals. Prospective nurse aides are trained at nursing schools and nurse aides' schools belonging to health centres or provincial hospitals. They receive professional training for two years.

The aid post orderlies are engaged in promotion of health activities and disease prevention activities aimed at rural village residents. In 1985 there were a total of 2,150 aid post orderlies, of which 2,000 belonged to provincial governments, and 150 to churches.

Prospective aid post orderlies are trained at aid post orderlies' schools. They receive professional training for two years. During the second year they receive on-the-job training at health centres and aid posts. At the two church-operated schools give the three year course training.

The hospital orderlies are engaged in orderlies' jobs at hospitals. Since they are not required to pass a qualification examination, their jobs are changing from medical care-related ones to unskilled labour. In 1985, 200 hospital orderlies were working at hospitals, and 541 at local medical care institutions.

The national government intends to eliminate hospital orderlies' jobs by the year 2000.

Table 2-26 Requirements for Base Level Medical Workers in 2000

	1985			2000		
	Government	Church	Total	Government	Church	Total
No. of aid posts	2121	110	2231	2290	110	2400
Aid post orderlies						
2-men aid post	132	-	132	660	60	720
1-man aid post	1908	110	2018	1950	90	2040
Hospital orderlies						
1-man aid post	147	-	147	-	-	-
Health Centre	394	-	394	-	-	-
Hospital	200	-	200	-	-	-
Nurse aides						
Health Centre	627	574	1201	1693	1058	2751
Hospital	777	-	777	1749	-	1749
Total	4185	684	4869	6052	1205	7250

(Source: National Health Plan 1986/90)

2-3 Facilities of PMGH

2-3-1 Organisation and Services Provided by PMGH

(1) Organisation

Port Moresby General Hospital (PMGH) is under the jurisdiction of the Secondary Health Services of the Department of Health and its organisation as of July 1, 1988 is as shown below.

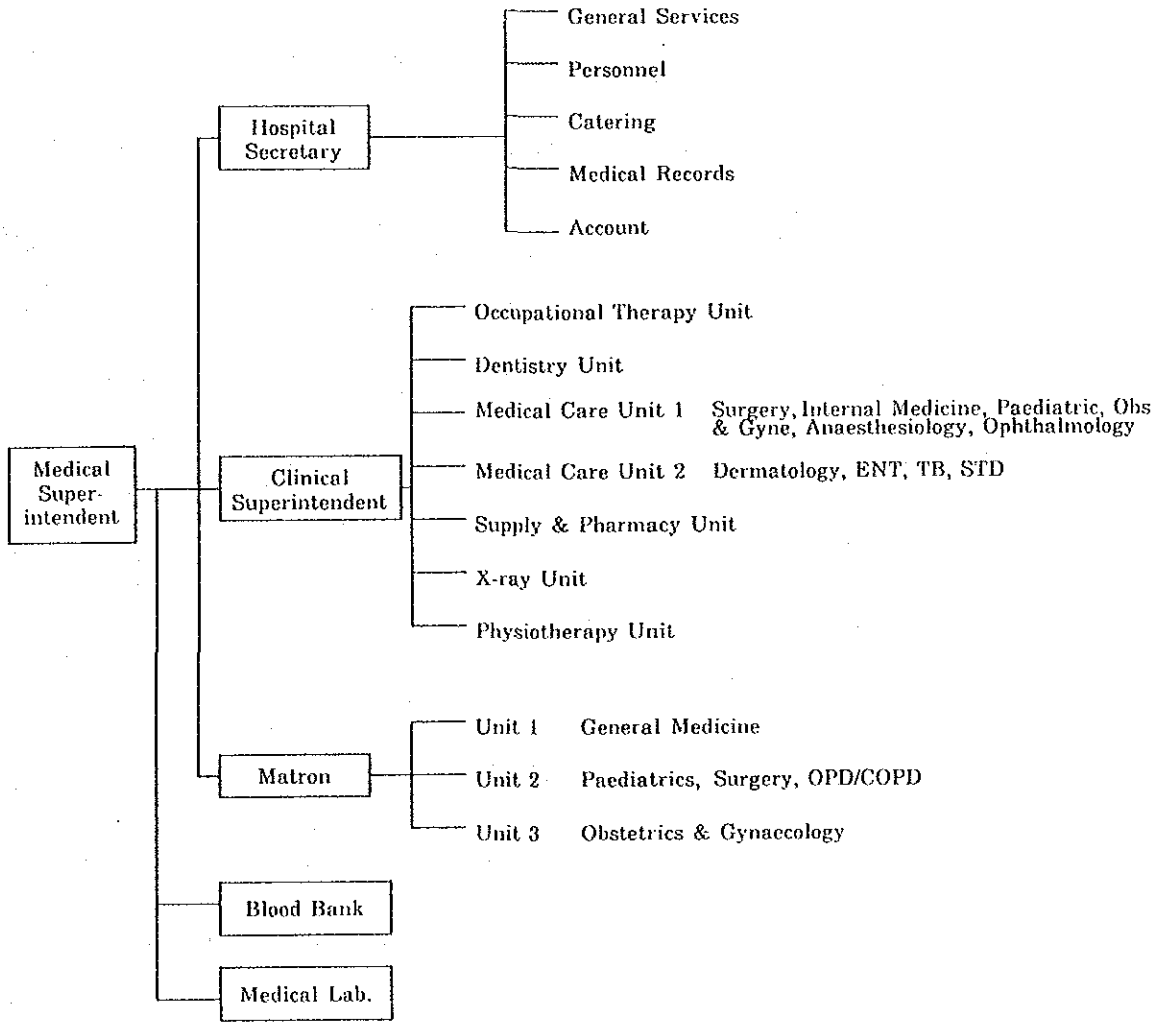

Fig. 2-9 Organisation of PMGH

(2) Services

Health services provided by PMGH are as shown below.

1) Diagnosis

- Surgery
- Internal medicine
- Paediatrics
- Obstetrics and gynaecology
- Ophthalmology
- Dermatology
- ENT
- Tuberculosis
- Sexually transmitted diseases
- Psychiatry
- Anaesthesiology

2) Pathology

3) Dentistry

4) X-ray diagnosis

5) Pharmacy

6) Occupational therapy

7) Physiotherapy

8) Wards

9) Blood bank

10) Nutritional education

11) Primary health service at urban clinics

12) Acceptance of referral patients and management of overseas treatment

13) Teaching hospital

14) Training medical care-related engineers and technicians

2-3-2 Operation, Management System and Budget

(1) Operation and Management System

Port Moresby General Hospital (PMGH) is under the direct control of the Department of Health. Maintenance of the facilities and equipment of PMGH, on the other hand, is conducted by the Department of Works. The hospital, which serves also as a teaching hospital, is closely associated with the Faculty of Medicine at University of Papua New Guinea, and invites instructors and doctors from these institutions for diagnosis and treatment of its patients. Furthermore, its blood bank is operated by the Red Cross Society and its pharmacy is operated by the Pharmaceutical Services Section of the Department of Health.

The following diagramme illustrates its operational relationships with outside organisations.

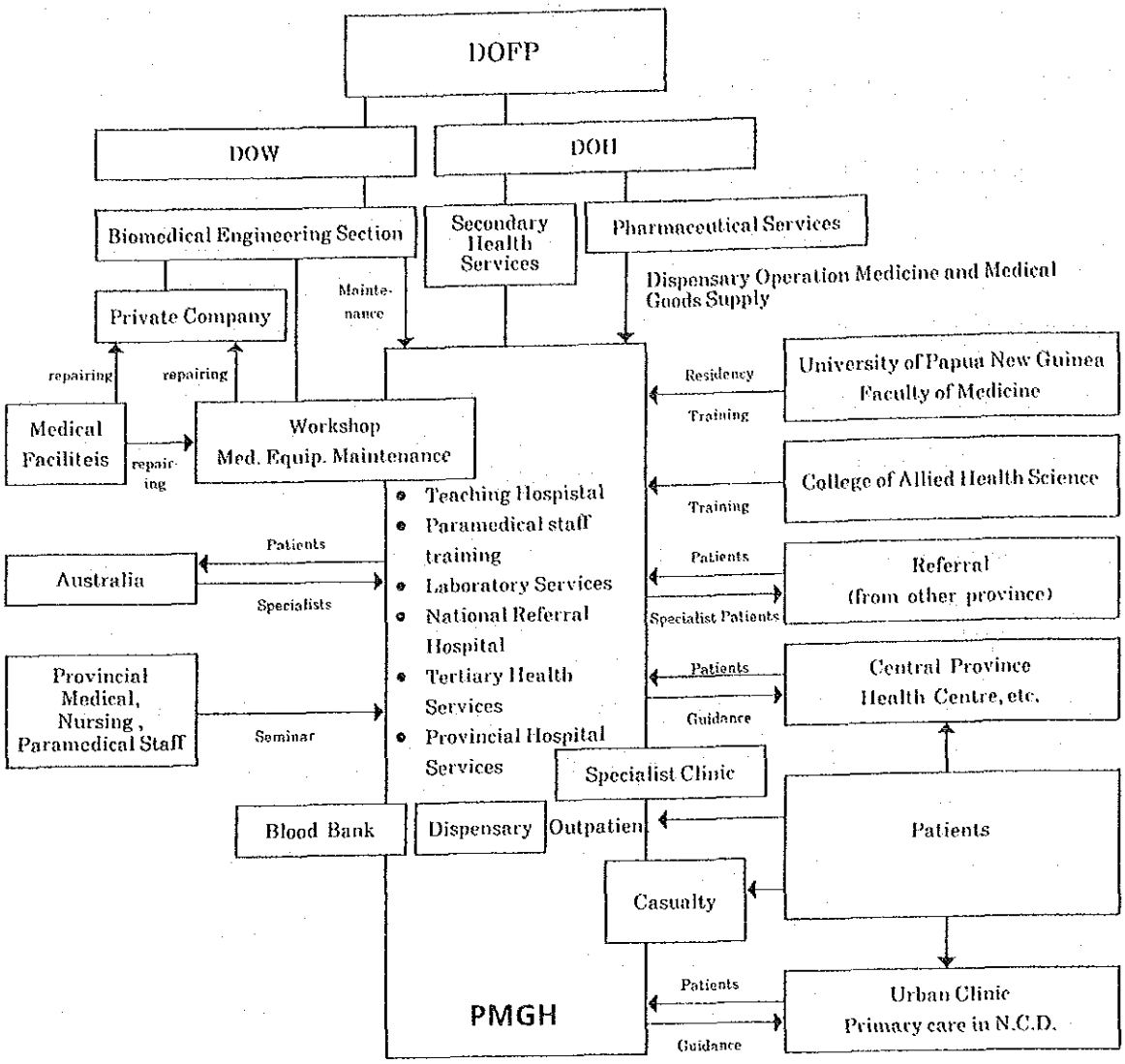

Fig. 2-10 Relationship of PMGH Activity May, 1988

1) Operation and Management of the Hospital

The medical superintendent of the hospital is responsible for all aspects of its operation and management. The hospital's organisation is classified into three major divisions - the administration division, the clinical division and the nursing division, which are headed respectively by the Hospital Secretary, the Clinical Superintendent and the Matron. The Clinical Superintendent who is

responsible for operation and management of the clinical division is elected by the hospital's senior members every 6 month.

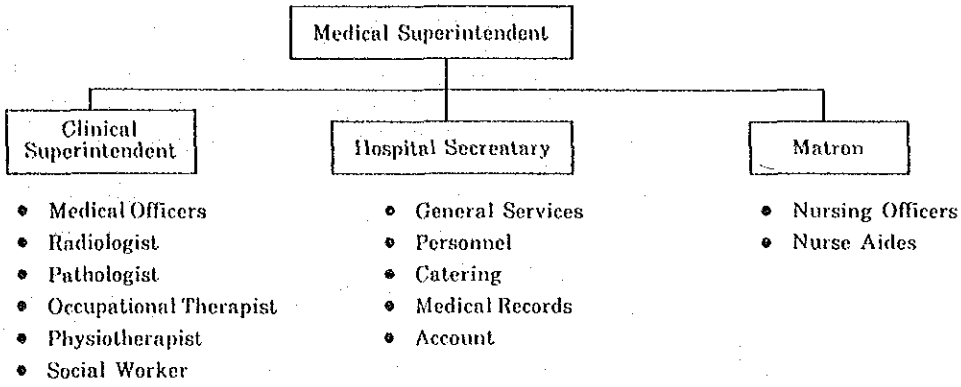

Fig. 2-11 Organisation of Staffing

Table 2-27 PMGH Staffing, 1987

Department	Position	Number
Medical Staff	Medical Off. (Government)	76
	Medical Off. (UPNG)	14
	Sub Total	90
Nursing Staff	Matron	1
	Deputy Matron	1
	Nursing Off.	190
	Nurse Aide	149
	Others	-
	Sub Total	341
Dental Staff	Dental Off.	2
	Others	19
	Sub Total	21
Paramedical Staff	Medical Technologist	25
	Radiographer	17
	Physiotherapist	3
	Occupational Therapist	1
	Social Worker	2
	Sub Total	67
Administrative Staff	Staff	95
	Associate member	162
	Sub Total	257
	Total Staff Number	776

(Source: PMGH)

2) Operation and Maintenance of the Facilities and Equipment

PMGH's facilities and equipment are maintained by the Operation Division of the Department of Works (DOW). The diagramme below shows the flow chart of the maintenance work.

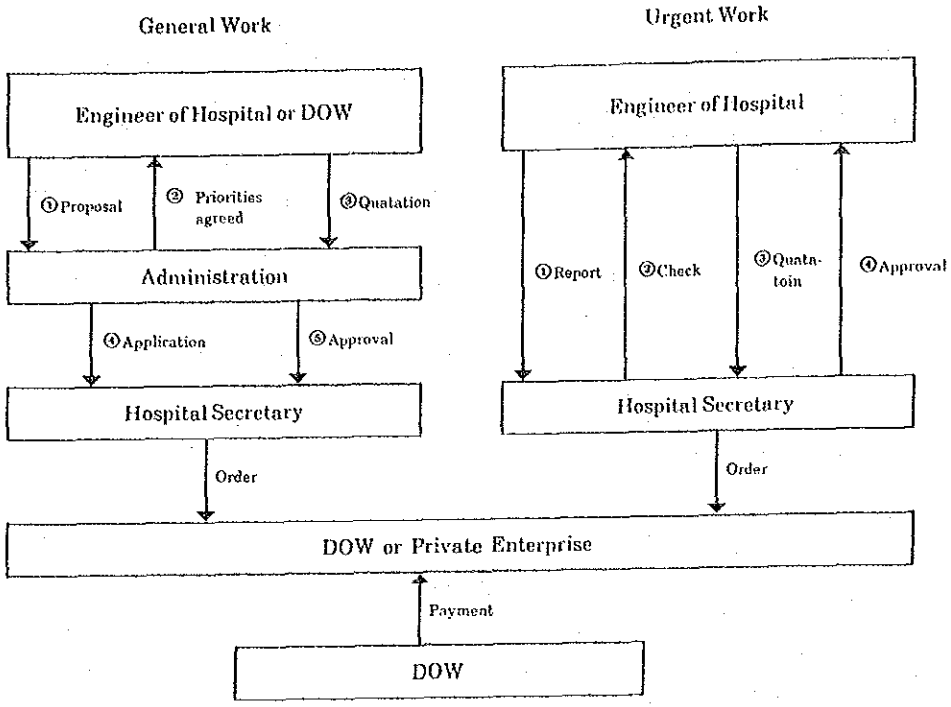

Fig. 2-12 Flow Chart of the Maintenance Work

The maintenance work is contracted out to DOW or private companies and the costs of the maintenance work are paid by the Department of Works. The budget for the maintenance work is allocated directly to the Department of Works. Records of the maintenance work for the past four years are kept.

Although part of the maintenance work for the medical equipment is conducted by the DOW personnel stationed at PMGH's workshops, most of their repair is contracted out to private companies.

- Operation and Maintenance Personnel

  PMGH's operation and maintenance personnel consists of the following 40 staff.

Table 2-28 Number of Maintenance Staff

DOW Maintenance Staff		PMGH Maintenance Staff	
Engineer	1		
Painter	3	General Staff	10
Carpenter	6	Electrician	8
Plumber	6	Air conditioner Mechanic	6
Total	16	Total	24

(Source: PMGH)

3) Operation and Management of the Pharmacy

PMGH's pharmacy is operated by the Pharmaceutical Services Section of the Department of Health and is distinguished from the hospital which is under the control of the Secondary Health Services of the Department of Health. The pharmacy also supplies medicines and medical equipment to government bodies. Its major activities are as itemised below.

(1) Supply of medicines and medical equipment to PMGH's clinical departments and wards.

(2) Supply of gas for medical use to urban clinics and hospitals in the Papua region.

(3) Supply of medical equipment to Boroko and students' clinics.

(4) Supply of first aid kits to government bodies and schools.

- Pharmacy Personnel

  In 1987 the pharmacy personnel consisted of the following 9 staff.

Table 2-29 Number of Staff

Dispensary	Pharmacist	1
	Dispenser	4
	Store	4
	Total	9

(Source: PMGH)

(2) Budget

PMGH's budget for 1987 was 4,737,300 Kina, which accounted for about 14.8 percent of the Department of Health's total budget for the year. Budgets related to the operation and management of PMGH include budgets for specialist, laboratory services, ambulance services and medicine/medical equipment services, training services, and DOW's budget for maintenance of PMGH facilities and equipment.

Table 2-30 DOH Budget and Expenditure, 1987

(Unit: Kina)

Item	Appropriation	Expenditure
1. General Services	2,008,400	2,029,850
2. Malaria Countrol	600,100	565,790
3. ADB Project I	394,000	373,539
4. ADB Project II	1,051,400	988,979
5. Increase Health Staff	55,100	48,641
6. Grants Charitable Organ	60,000	60,000
7. Primary Health Services	800,800	729,170
8. Secondary Health Services	85,600	109,871
9. Architectural Maintenance	607,300	552,524
10. PMGH	4,737,300	4,684,175
11. Specialist Medical Officers	1,790,500	1,652,549
12. Angau Memorial Hospital	3,152,000	3,158,551
13. Laboratory Services	492,000	479,196
14. Ambulance Services	190,300	190,300
15. Laloki Psychiatric Centre	617,400	609,089
16. Pharmaceutical Services	7,882,700	7,668,998
17. Rural Health Programme	381,700	342,054
18. Diploma, Certificate, Training	6,243,200	5,665,106
19. Phsyotherapy Training	17,000	14,425
20. Rural Diagnostic Services	22,600	11,377
21. Base Level Staff Training	336,500	279,954
22. Health Messes	529,600	456,664
Total	32,055,500	30,670,818

(Source: DOH)

1) Running Cost of Hospital

Table 2-31 Annual Expenditure, PMGH

(Unit: Kina)

	1984	1985	1986	1987
Personnel Emoluments	2,336,578	2,331,108	2,358,083	2,505,697
Travel & Accommodation	44,831	50,006	43,743	33,243
Utilities	486,162	500,004	476,027	870,252
Materials & Supplies	519,728	558250	367,413	408,881
Plant & Transport	47,663	71,662	70,812	78,976
Special Services	294,642	234,702	256,291	28,376
Purchase of Capital Assets	357,075	35,875	3,111	4,250
Grants & Subsidies	0	0	0	0
Others	15,840	12,749	4,700	2,200
Other Personnel expenses	670,860	667,234	681,565	751,460
Total	4,773,379	4,461,590	4,261,745	4,936,335
A/A	165,483	197,840	223,926	252,160
Grand Total	4,607,896	4,263,750	4,037,819	4,684,175

(Source: DOW)

2) Maintenance Expenses

PMGH's maintenance expenses are covered by DOW's maintenance budget and they are paid directly by DOW.

Table 2-32 Annual Budget and Expenditure for Maintenance, PMGH

(Unit: Kina)

	1984	1985	1986	1987
Expenditure	166,659	219,252	135,296	86,511
Appropriation	161,000	220,300	225,300	94,300

(Source: PMGH)

3) Pharmacy Operation and Management Expenses

The Pharmaceutical Services Sections of the Department of Health is responsible for the operation and management of PMGH's pharmacy. Table 2-33 shows is the trend in PMGH's medicine procurement expenses.