BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR CONSTRUCTION
OF
MANDALAY TEACHING HOSPITAL
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

JULY, 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

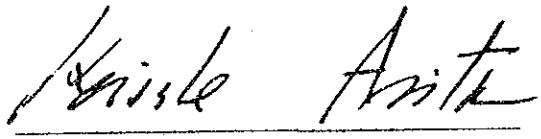
In response to the request of the Government of the Socialist Republic of the Union of Burma, the Government of Japan decided to conduct a Basic Design Study on the Project for Construction of Mandalay Teaching Hospital and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Burma the Basic Design Study (Phase I) Team headed by Dr. Osamu Yoshida, Professor of Faculty of Medicine, Kyoto University from January 28th to February 24th in 1987, and the Basic Design Study (Phase II) Team headed by Dr. Kanji Torizuka, Vice President, Fukui School of Medicine from April 22nd to May 3rd in 1987.

The team had discussions on the Project with the officials concerned of the Government of the Socialist Republic of the Union of Burma and conducted a field survey in Mandalay and Rangoon areas. After the team returned to Japan, further studies were made and a draft report was prepared and, for the explanation and discussion of it, a mission headed by Dr. Yoshihiro Hamashima, Professor of Kyoto Women's University was sent to Burma from July 1st to July 10th in 1987. 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 the two countries.

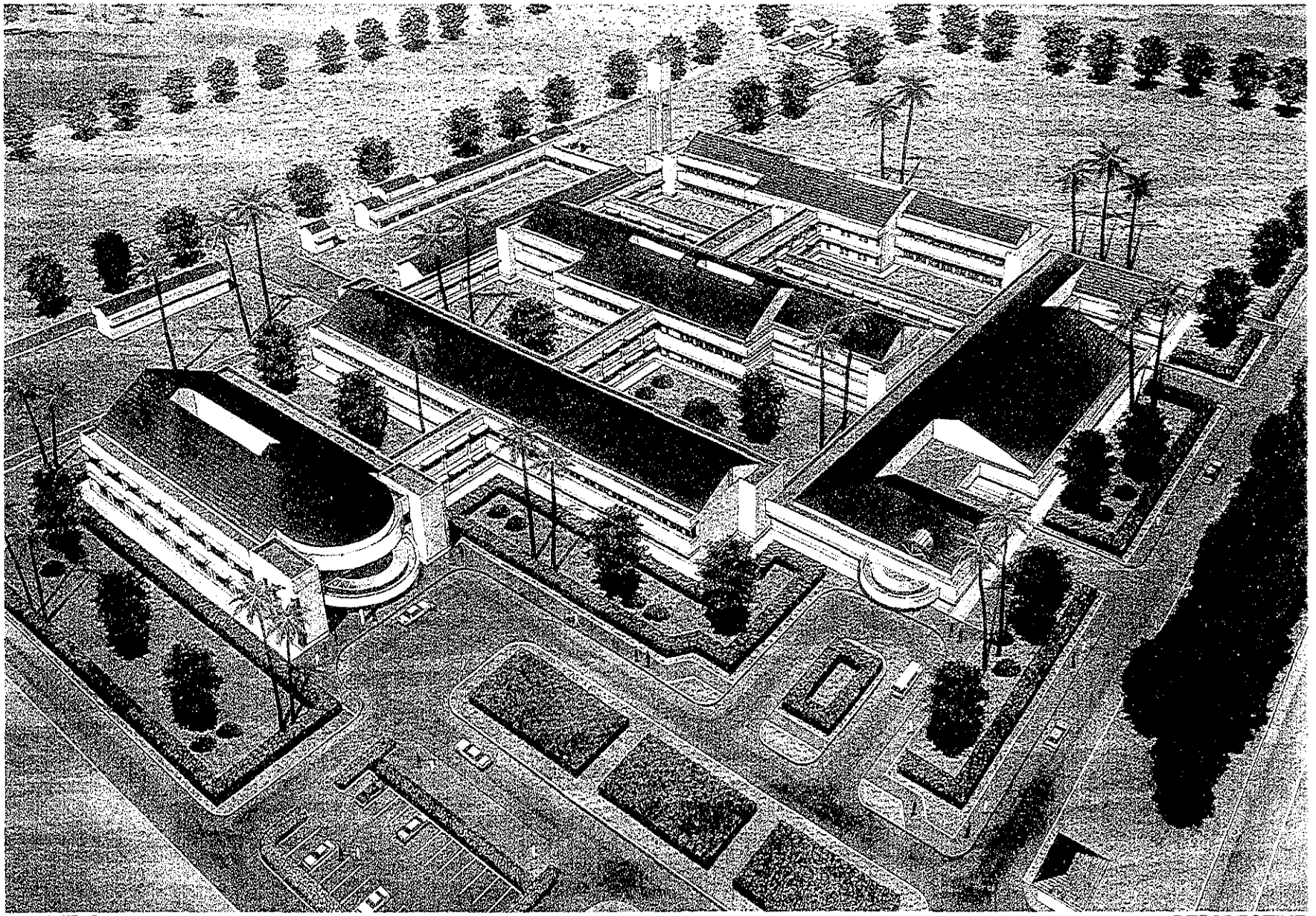
I wish to express my deep appreciation to the officials concerned of the Government of the Socialist Republic of the Union of Burma for their close cooperation extended to the team.

July, 1987



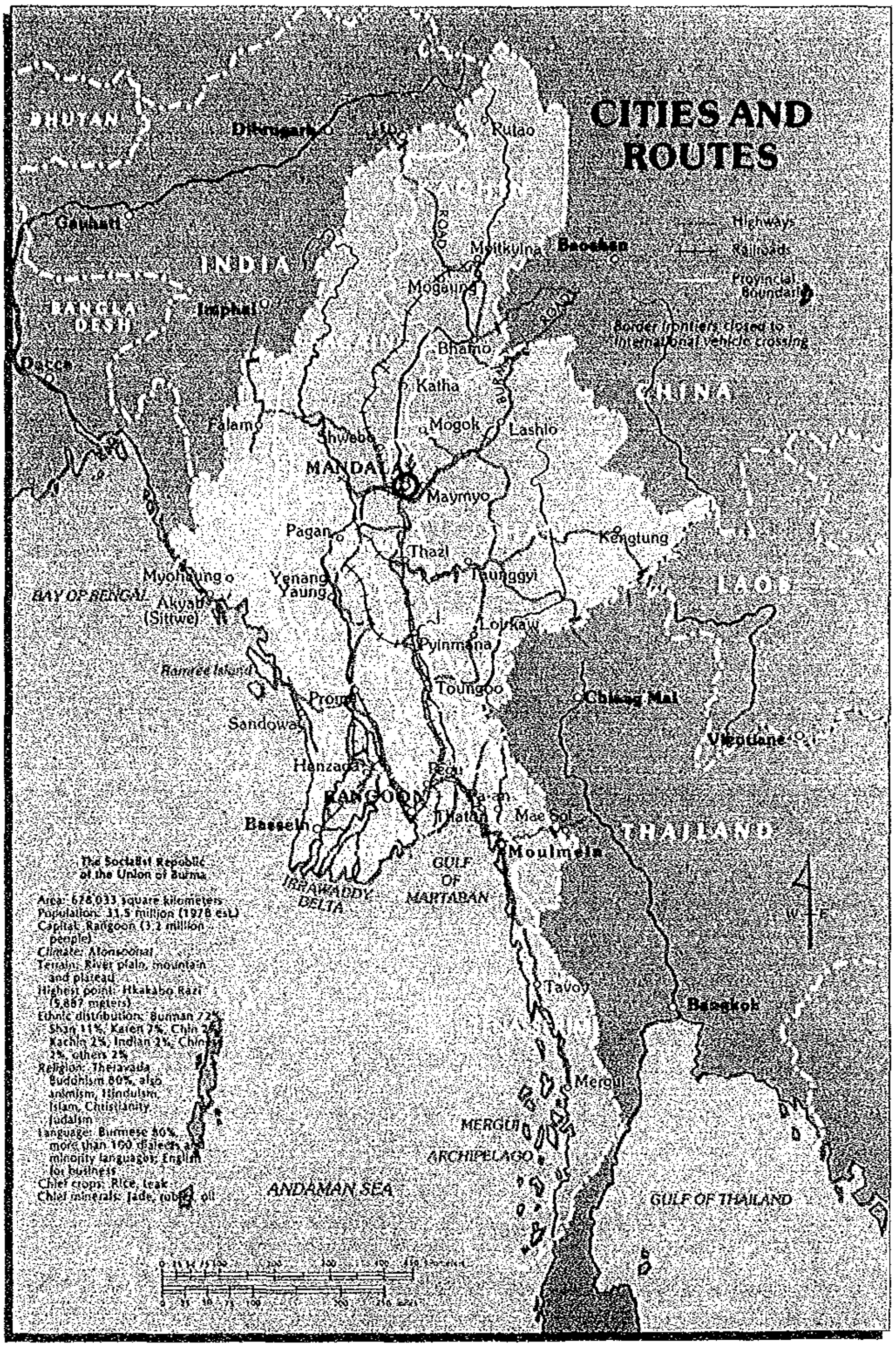
Keisuke Arita

President
Japan International Cooperation Agency

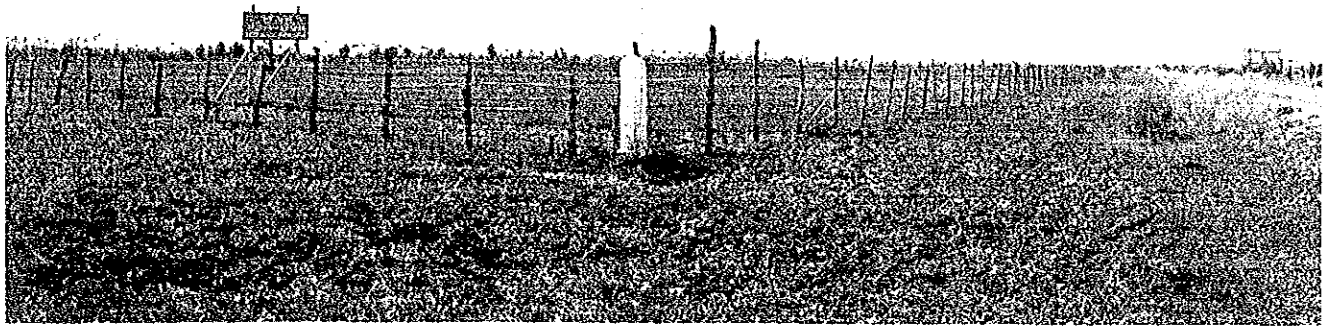


MANDALAY TEACHING HOSPITAL

PERSPECTIVE


CITIES AND ROUTES
Highways
Railroads
Provincial Boundaries
Border frontiers closed to international vehicle crossing
BHUTAN
INDIA
BANGLA DESH
CHINA
LAOS
THAILAND
Dibrugarh
Gauhati
Imphal
Dacca
Putao
Myitkyina
Baoshan
Mogaung
Bhamo
Katha
Mogok
Lashio
Falam
Shwebo
MANDALAY
Maymyo
Pagan
Thazi
Taunggyi
Kengtung
Myohaung
Yenangyaung
Akyab (Sittwe)
BAY OF BENGAL
Ramree Island
Loikaw
Pyinmana
Toungoo
Chiang Mai
Vientiane
Prome
Sandoway
Henzada
Pegu
RANGOON
Bassein
Thaton
Pa-an
Mae Sot
Moulmein
GULF OF MARTABAN
IRRAWADDY DELTA
Tavoy
Bangkok
Mergui
MERGUI ARCHIPELAGO
ANDAMAN SEA
GULF OF THAILAND
The Socialist Republic of the Union of Burma
Area: 678,033 square kilometers
Population: 31.5 million (1978 est.)
Capital: Rangoon (3.2 million people)
Climate: Monsoonal
Terrain: River plain, mountain and plateau
Highest point: Hkakabo Razi (5,887 meters)
Religion: Theravada Buddhism 80%, also animism, Hinduism, Islam, Christianity, Judaism
Chief crops: Rice, teak

MAP OF BURMA



PROPOSED CONSTRUCTION SITE

SUMMARY

SUMMARY

The health and medical care administration system in the Socialist Republic of the Union of Burma is controlled by the Ministry of Health. It aims at the establishment of a comprehensive medical organization network based on primary health care so that health services may be uniformly provided to all the people. To this end, a referral system has been introduced in which all of the 631 hospitals (as of 1986) in Burma are divided into levels of referral units in accordance with their degrees of specialization, staff, scale, and servicing areas, supported by 1,796 health centers of various types (as of 1986) arranged thereunder. The objective of this system is to provide efficient health services to patients at the minimum possible outlay in accordance with their medical need. To date, however, this system only partially fullfilld the objectives as originally intended owing mainly to the shortage of medical staff, facilities, and equipment.

The Government of Burma has carried out People's Health Plans I and II (PHP-I and II) in response to the Third and Fourth Four-Year Plans for social and economic development, and it has been carrying out People's Health Plan III (PHP-III) as an integral part of the Fifth Four-Year Plan since 1986/87. The number of available beds per unit of population in this country ranges from 1/10 to 1/20 of the figure in the industrialized countries. Population growth further imposes a strain on the resources and also widened the bed population ratio. Moreover, there have been substantial regional differences in medical services, especially in hospital facilities, between the Rangoon area where the capital city is located and other places. In Mandalay, which is the leading division in Upper Burma, the number of available beds per unit of population is less than half of that in Rangoon.

With reference to the medical education system in this country, the total capacity of a single school year in the three Institutes of Medicine (5 school-year system with an education period of 6.5 years: consisted of the Institute of Medicine, Rangoon-I, the Institute of Medicine, Rangoon-II, and the Institute of Medicine, Mandalay) is 550, and this has conventionally been divided between Rangoon and Mandalay at the respective

rates of 400 and 150, irrespective of the fact that there is no significant difference in population between the two divisions. To correct such regional differences that favor Rangoon, the Burmese Government has recently determined to shift 50 places from the number of admissions to the Institutes in Rangoon to increase admissions to the Institute of Medicine, Mandalay (IMM) from 150 to 200. As a result, IMM is constructing a lecture building to increase the capacity to furnish lectures to first and second year students.

In Mandalay, however, the number of hospital beds available for students' clinical practice, which is one of the vital factors in medical education, is only 1/6 of that in Rangoon. The Mandalay General Hospital (MGH) which is located at the top of the referral system in Upper Burma and is a teaching hospital for the IMM, is equipped largely with rather old facilities and equipment and accommodates inpatients whose number substantially exceeds the officially approved number of beds. Being overcrowded with inpatients, the MGH is not in a condition to furnish appropriate clinical practice. Moreover, the MGH is situated in the central area of the City of Mandalay and its ground area is too limited to allow expansion plans to substantially increase the hospital's capacity.

In Burma, unlike developed countries where cancer and heart disease occupy prominent positions in the causes of death, infectious diseases such as malaria, ill-defined intestinal infections, tuberculosis, and influenza account for almost 30% of causes of death owing to a variety of factors including the climatic, social and economic conditions. Therapeutic methods to cope with these types of diseases have been established in modern medicine and preventive medicine has clarified that their occurrence can be prevented merely by improving environmental hygiene and diffusing the concept of hygiene throughout the country. Therefore, if medical personnel with modernized knowledge and skill are appropriately distributed to meet the medical requirements, it is hopeful that the health and medical level in Burma will be raised to a satisfactory extent. The Ministry of Health has established the goal for medical education whereby general doctors who have completed a one-year intern training course after graduation from the institutes of medicine may acquire the capabilities necessary of "family doctor" type doctors (rather than

specialized doctors) who would contribute to upgrading the level of primary health care.

Under these circumstances, the Burmese Government planned to construct a teaching hospital which should be equipped to function as a general hospital as a central referral hospital in Upper Burma as well as to furnish students of the IMM and nursing and midwife schools with clinical practice. The Burmese Government incorporated this teaching hospital in PHP-III, and then requested the Japanese Government to extend grant aid cooperation for constructing the Mandalay Teaching Hospital. In response thereto, the Japanese Government 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 November 1986 and the Basic Design Study Teams (Phase I and Phase II) in January and April 1987, respectively, to confirm the details of the request and to study the background and the implementation organization of the project, the operation and administration system of the Hospital, conditions at the proposed construction site, the possibility of operation budget allocation, appropriateness of the grant aid cooperation, and the construction situation in Burma. After post survey analyses in Japan and explanation of draft reports to the Burmese counterparts, this Basic Design Study Report has been completed.

The Burmese implementation agency of this Project is the Department of Health, the Ministry of Health, and when the Mandalay Teaching Hospital commences medical services, a hospital operation organization headed by the Medical Superintendent of the Hospital will be established under the Department of Health.

An Outpatient Dept., Central Diagnosis and Treatment Dept. Ward Dept. (internal medicine, surgery, obstetrics and gynaecology, and paediatrics disciplines), Medical Administration Dept. and Adminitration & Service Dept. will be provided in the Mandalay Teaching Hospital from the viewpoint that it should discharge medical functions both as a general hospital and as a referral one. To discharge the functions of a teaching hospital, it will be equipped with the Academic Dept. which takes charge of lectures and seminars. It is planned that clinical education of each 50 out of the capacity of 200 students for the third to fifth school years, or a total of 150 students of the IMM, will be done in the Mandalay

Teaching Hospital. Lectures will be offered in the Academic Dept., but clinical practice in a form of on-the-job training to be furnished to small groups of students by utilizing each Department other than the Academic Dept. will actually play the main educational role in this Hospital. In addition to the above-mentioned education for the undergraduate students of the IMM, the Mandalay Teaching Hospital will furnish education programs composed of clinical practice to interns (approx. 20), postgraduate students (approx. 5), nursing school students (approx. 20), and midwife school students (approx. 20).

The proposed construction site is situated about 4km southeast of the center of Mandalay City and has a site area of approximately 29ha which was once used as paddy fields. The site has already been acquired by the Ministry of Health.

Based on the aforementioned medical and educational functions of the Teaching Hospital, the details of the Burmese request and a result of analyses of the survey data including local medical services demands, operating and administrative capabilities, natural conditions, proposed construction site, infrastructure, maintenance and administration conditions of existing medical facilities, and the local construction situation, the contents and scale most suitable for this Project were proposed as enumerated below, and the basic design has been specified under this proposal.

- Construction site : Mandalay City, Mandalay Division
- Total floor area : approx. 17,990m^2
- Structure and number of stories : Reinforced concrete two-story buildings (partly single-story)

- Contents of the facilities :

1. Main building

(1) Outpatient Dept.:
Outpatient Division and Emergency Division

(2) Central Diagnosis & Treatment Dept.
Medical Lab. Division, Diagnostic Division, X-ray Division, Operation Division, Delivery Division, ICU·CCU Division (6 beds),

Central Sterilizing Supply Division, Blood Bank Division, Physiotherapy Division, Forensic Medicine Division, and Mortuary Division

(3) Ward Dept.
Internal Medicine Ward (78 beds), Surgery Ward (78 beds), Obstetrics and Gynaecology Ward (78 beds), and Paediatrics Ward (78 beds)

(4) Medical Administration Dept.
Office rooms, repair shop, solution making room, reagent room, and medicine store, etc.

(5) Administration & Service Dept.
Office rooms, cafeteria, electrical room, etc.

(6) Academic Dept.
Lecture rooms, students' room, library, doctors' lounge, seminar rooms, etc.

2. Mortuary building

(1) Central Diagnosis and Treatment Dept.:
Mortuary, autopsy, etc.

(2) Academic Dept.
Lecture theater and doctors' rooms

3. Kitchen and laundry building

4. Others:
Oxygen mini plant, boiler room, incinerator, pump house, maintenance building, guard house, guest house

- Contents of equipment:

1. Outpatient Dept.

(1) Outpatient Division
Sphygmomanometer, 3-ch electrocardiograph, Resuscitator,

Gynaecological examination unit, Ultrasound diagnostic equipment, etc.

(2) Emergency Division
Universal operating table, Defibrillator, Surgical X-ray apparatus, Blood chemistry analyzer, etc.

2. Central Diagnosis and Treatment Dept.

(1) Medical Lab. Division
Centrifuge, Blood cell counter, Coagulo meter, Haemoglobin analyzer, etc.

(2) Diagnostic Division
Autospirometer, 6-ch electrocardiograph, 13-ch electroencephalograph, Ultrasound diagnostic equipment, Fiberscope, etc.

(3) X-ray Division
Diagnostic X-ray equipment, Remote-control type X-ray TV system, Tomographic X-ray equipment, Mammographic X-ray system, Angio cardio diagnostic X-ray system, etc.

(4) Operation Division
Operating light, Operating table, Anaesthesia apparatus, Electrosurgical unit, Patient monitoring system, Surgical instrument set, etc.

(5) Delivery Division
Obstetric delivery table, Infant incubator, Vacuum extractor, Fetal monitor, etc.

(6) ICU·CCU Division
Patient monitoring system, Cardiac output measurement, Lung ventilator, Oxygen tent, etc.

(7) Central Sterilizing Supply Division
Ultrasonic cleaner, High pressure steam sterilizer, etc.

(8) Blood Bank Division

Blood storage refrigerator, Deep freezer, Electric slide rotator, etc.

(9) Physiotherapy Division

Ultrasonic therapy apparatus, Dragging exercise chair, Bicycle exercise, Lower limbs extension chair, etc.

(10) Forensic Medicine Division

Gynaecological examination table, Research microscope, Hot air sterilizer, etc.

(11) Mortuary Division

Mortuary refrigerator, Autopsy table, Major shadowless operating light, etc.

3. Ward Dept.

Gatch bed for adults, Bed for paediatrics, Infant incubator, Bedpan washer sanitizer, etc.

4. Medical Administration Dept.

(1) Repair Section

Oscilloscope, Tester, Instrument set for repairing, etc.

(2) Supply & Pharmacy Section

Water distilling apparatus, Autoclave for bottles, Oxygen production plant, etc.

5. Academic Dept.

Overhead projector, Slide projector, Projection microscope, Photography technical instrument set, Copy machine, etc.

6. In addition to those items listed above, furniture and fittings required for medical and educational activities will be allocated to the necessary departments and divisions.

It has been planned to adopt local construction methods and materials as far as they are acceptable for maintaining the performance of the Hospital so that technical and economic burdens on the Burmese side may be lightened. However, it is difficult to procure materials locally except

for some materials of structural work. Medical equipment has been selected giving priority to the basic types and to minimizing possibilities for problems that may occur in daily maintenance, repair work, and procurement of parts. As almost none of the items of medical equipment are produced locally, it is planned to import them from Japan.

The construction period is estimated to be about 24 months. The cost to be borne by the Burmese Government is estimated at 5.65 million Kyats.

The budget for hospital operation such as personnel expenses, utility expenses, and administration expenses will be directly allocated to the Mandalay Teaching Hospital from the Department of Health, and separately from this budget, medical equipment maintainance expenses as well as pharmaceuticals and medical goods will also be supplied from the Department of Health through the Central Medical Store Depot (CMSD). Since the maintenance and administration expenses of the Hospital after the third year of its opening are estimated to be about 7.66 million Kyats or equivalent to about 1.51% of the total annual budget (1986/87) of the Department of Health of the Ministry of Health, namely, approximately 507 million Kyats, it may be said that these expenses fall within a reasonable range.

The construction of this Teaching Hospital is indispensable, and when it is opened and is smoothly operated, the quality of medical services in the Mandalay area will be improved by the establishment of this medical facility with the latest equipment. The referral system in Upper Burma will also be reinforced by establishing this central referral hospital which will cooperate with the Mandalay General Hospital. With reference to the effect on medical education, the Mandalay Teaching Hospital will furnish opportunities for clinical practice corresponding to the planned increase in the number of students in the IMM so that higher quality may be ensured in their education, and clinical practice will also be given to students of the nursing and midwife schools, thereby continuously assisting in qualitative improvement of medical education in the future. If graduates of the IMM are correctly placed in both rural area and urban area, the Mandalay Teaching Hospital will substantially contribute to the improvement of health and medical levels throughout the country.

Since this Project is considered to be urgently needed, the grant aid cooperation by the Japanese Government for the Project for the Construction of the Mandalay Teaching Hospital is judged to have sufficient propriety.

It is required for the purpose of ensuring the operating effects of this Project that a close cooperation system in the Ministry of Health such as between the Department of Health and the Department of Medical Education and between the Institute of Medicine, Mandalay or the Department of Health and this Mandalay Teaching Hospital should be established. Efforts should also be made to recruit necessary personnel prior to the inauguration of the hospital, and to ensure an operational budget for medical and educational activities of the Teaching Hospital, especially a foreign currency budget in spite of the difficulties in this respect in Burma. In order to amplify the effect of the Project to the maximum, further efforts towards the realization of Japanese Technical Cooperation should be made by both countries.

CONTENTS

CHAPTER 1
INTRODUCTION

CHAPTER 1 INTRODUCTION

The present health and medical level in Burma has not yet reached a satisfactory level, and as such, more efforts are expected to be exerted for the improvement of primary health care. It is advisable to educate practical medical personnel of a home doctor type who have mastered basic modern medicine and have a full knowledge of the special conditions in Burma including the characteristics of diseases, climate, and living customs.

Although the Government of the Socialist Republic of the Union of Burma has made strenuous efforts to improve its medical facilities through several phases of its People's Health Plan, their goals have not been fully achieved. As a result, the present level of development does not meet Burma's practical needs. Moreover, there remain striking regional differences in the level of medical development between Rangoon and other local areas. Even in Mandalay which has the second largest population next to Rangoon, the number of available hospital beds is less than half of that in Rangoon City.

Referring to medical education, the number of students enrolled in the three medical institutes in Burma (with a total number per school year of approximately 550 students) is out of balance, with 400 being in Rangoon and 150 in Mandalay. In Mandalay, moreover, the number of beds used for clinical practice, to which top priority should be given as essential to medical education, is quite limited. The Mandalay General Hospital, which plays the main role as clinical teaching hospital in this area, officially has 800 beds available but in actuality admits 1,000 to 1,300 inpatients and both facilities and medical equipment have become rather old. It is rather difficult to say that the most appropriate medical education is being given to the students there.

The Government of Burma has adopted a plan to increase the number of students admitted to the Institute of Medicine, Mandalay (IMM) from 150 to 200 as one of its measures to correct the maldistribution stated above. In addition, it has determined the need to construct a teaching hospital in the City of Mandalay for the purpose of furnishing opportunities for clinical practice to IMM's students and for practical training for nurses

and midwives as well as of upgrading medical services in the whole of Upper Burma. Thus, the Government has requested the Japanese Government, which once cooperated in the construction of a general hospital in Rangoon City, to extend grant aid cooperation and technical cooperation for the said Teaching Hospital.

In response to this request, the Japanese Government decided to carry out a survey for the project and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Burma a Technical Cooperation Survey Team in August 1986 and a Preliminary Survey Team in November 1986, which confirmed the proposed construction site and discussed details of the technical cooperation and grant aid. In response to Burma's earnest concern for early commencement of the construction of the said Teaching Hospital under grant aid cooperation, JICA sent the Basic Design Study Team (Phase I and Phase II in January and April 1987, respectively), and carried out a survey and discussions on the viability of the project regarding the items mentioned below.

1. Analysis of the project background and its appropriateness

2. Situation regarding medical service and education in Burma

3. Positioning of this project in the People's Health Plan-III

4. Discussion of the contents and scale of the project

5. Confirmation of the project implementation system, operation and management system, scope of work on the Burmese side, and budget allocation

6. Survey of proposed construction site

7. Survey of related existing facilities

8. Data collection regarding the construction situation in Burma.

This report compiles the results of the above-mentioned surveys in Burma, post-survey analyses in Japan and explanation of draft report in Burma in July, 1987. The minutes of discussions (copy), list of the study team members, their study itinerary, and other relevant data are annexed to the end of this report.

CHAPTER 2
BACKGROUND OF THE PROJECT

CHAPTER 2 BACKGROUND OF THE PROJECT

2-1 Outline of Related Health Programs

2-1-1 New Twenty-year Plan

In 1972 the Central Committee of the Burma Socialist Programme Party adopted a "Guideline for the Twenty-year Plan" under the "Basic Outline for Economic Development" and commenced the First Four-year Plan. Coinciding with the transfer to a civilian government in 1974, this Guideline was revised into a "New Twenty-year Plan" (from 1974/75 to 1993/94) for social and economic development. The New Twenty-year Plan carries the 6 items mentioned below as the guideline for planning people's health and medical projects.

1. To enhance the level of workers' health, or to cope with any types of diseases which may occur within the country, by developing effective therapeutic methods.

2. To attach importance to the prevention of diseases through the diffusion of knowledge on environmental hygiene.

3. To make efforts to minimize differences in health and medical service levels between urban and rural districts.

4. To realize qualitative improvements of health and medical facilities with the cooperation of local communities.

5. To extend and improve health and medical services and social welfare services in response to the economic development of the country.

6. To construct new hospitals and health centers, to diffuse plans and thoughts on the cure, prevention, and eradication of diseases, to improve water supply networks in rural districts, and to dig more wells.

The items listed above cover all health and medical fields. It is clear that the main objective is to realize the qualitative improvement of primary health care. The New Twenty-year Plan has been executed by

dividing it into five Four-year Plans. Three People's Health Plans (PHP's) have been set up and carried out in accordance with the Third, Fourth and Fifth Four-year Plan.
Presently, the "Fifth Four-year Plan" is under way, and the Third People's Health Plan (PHP-III) corresponds to the health sector of the Fifth Four-year Plan.

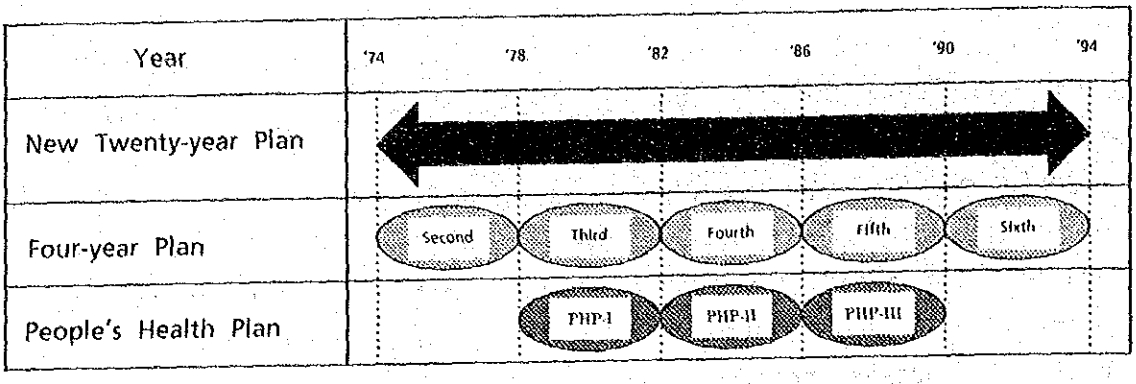


Fig. 2-1 Position of the people's health plans

2-1-2 People's Health Plan (PHP)

In People's Health Plan-II (PHP-II, 1982/83~1985/86) which succeeded People's Health Plan-I (PHP-I, 1978/79~1981/82),the level of health and medical services was considerably enhanced in each sector. First of all, the ratio of the health and medical service budget to the whole governmental budget was increased. Some slight progress was made in reducing regional differences in health and medical services between urban and rural districts. The diffusion ratio of primary health care, which is expected to reach 100% by 1990, reached the level of 63.3% in PHP-II. Although the rate of morbidity was not reduced so remarkably for most kinds of diseases,the rate of mortality was reduced among those patients who received medical services, thereby it is supposed that the level of diagnosis and cure had been improved during PHP-II. Regarding malaria, the targets were attained in terms of all the indices. However, as may be seen from the fact that the morbidity rate of dengue for children was doubled while the mortality rate was halved, it is supposed that the improvement of local environmental hygiene fell behind progress in the level of diagnosis and cure.

In 1986, the Third People's Health Plan (PHP-III) started after PHP-II. The action programs of PHP-III include the following five items.

1. To strengthen community health and medical services.

2. To establish disease-prevention systems.

3. To upgrade environmental standards (including public health and protection from labor disasters).

4. To enhance medical levels in hospitals.

5. To reinforce support systems such as personnel and equipment to improve health and medical levels.

   5-1 To train medical manpower

   5-2 To supply, maintain, and control medical equipment and instruments in a more appropriate manner.

   5-3 To diffuse knowledge on health and hygiene.

   5-4 To reinforce test and inspection systems including those for foods and pharmaceuticals.

The following two items are taken as guidelines for carrying out PHP-III.

1. To attach more importance to enhancing health and medical levels which are directly concerned with community inhabitants.

2. To review quantitative expansion and qualitative improvement of health and medical services, based on the results obtained during PHP-II.

It is proposed to increase the number of staff by 9,708 in total in order to carry out the action programs included in the five items as described above during the period of PHP-III. It is scheduled to allocate 2,035 (20.1%) of the total increase in personnel to the objective of improving medical levels in hospitals.

Table 2-1 Manpower requirement by program for PHP-III (1986/87~1989/90)

Program	Proposed Expansion for PHP-III				Total
	1986/87	1987/88	1988/89	1989/90	
1.Community Health Care	1,250	1,250	1,357	1,250	5,107
2.Disease Control	249	240	239	254	982
3.Environmental Health	61	53	39	35	188
4.Hospital Care	568	538	554	375	2,035
5.Support					
5-1 Health Manpower	112	81	72	47	312
5-2 Maintenance & Repair	77	67	73	17	234
5-3 Health Education	31	10	–	–	41
5-4 Lab. Service	141	178	208	282	809
Total	2,489	2,417	2,542	2,260	9,708

(Source: Ministry of Health)

As shown in Table 2-2, the total budget for the four years amounts to 1,518,600,000Ks, with the average amount for one year being 380,000,000Ks and approximately 40% of the budget is expected to be funded by foreign countries. More than half of the budget is allocated to the improvement of community health care. Although disease prevention and environmental standard improvement occupy 12.1% of the increments in the number of staff, these items occupy 33.2% of the budget amount. In contrast, the item of hospital care occupies 20.1% of the increments in the number of staff, but it occupies only 4.1% of the budget.

Table 2-2 Total input by program for PHP-III

Program	Input (1986–1990) (Ks Million)	%
1.Community Health Care	835.2	55.0
2.Disease Control	235.9	15.5
3.Environmental Health	269.1	17.7
4.Hospital Care	*61.7	4.1
5.Support	116.7	7.7
5-1 Health Manpower Dev.	22.4	
5-2 Maintenance & Repair	8.2	
5-3 Health Education	50.9	
5-4 Lab. Service	35.2	
Total	1,518.6	100.0

(Source: Ministry of Health)

* Excluding foreign currencies, loans, aids and grants.

The chapter "Hospital Care Project" in PHP-III details the objective of improving hospital care, and the number of available beds is proposed to be increased by 2,276 by 1990. Table 2-3 indicates concrete programs for improving the respective hospitals, and among them a program is included to construct a new general hospital with 300 beds in the City of Mandalay. The Burmese side is planning to construct the Mandalay Teaching Hospital (MTH) with Japanese grant aid cooperation to cover this 300 bed new general hospital which is planned in PHP-III.

Table 2-3 Hospital facilities improvement programs under PHP-III

No.	Categories	No. of hospitals	EXpansion of bed in PHP-III
1.	New station hospital	20	320..... (16×20)
2.	Upgrading of 16 to 25 bedded hospital	30	270.....{30×(25-16)}
3.	Upgrading of 25 to 50 bedded hospital	6	150..... {6×(50-25)}
4.	Upgrading of 50 to 100 bedded hospital	2	100..... {2×(100-50)}
5.	Upgrading of 100 to 150 bedded hospital	4	200.....{4×(150-100)}
6.	Upgrading of General hospital in States/ Div. (Prome, Loikaw, Monywa, Pa-an)	4	200
7.	Upgrading of general hospitals in Rangoon	4	200
8.	Upgrading of South Okkalapa Hospital to general hospital	1	50
9.	600 bed hospital in Rangoon (Phase I only)	1	336
10.	300 bed general hospital in Mandalay	1	300
11.	150 bed Eye Hospital in Rangoon	1	150
			Total 2,276

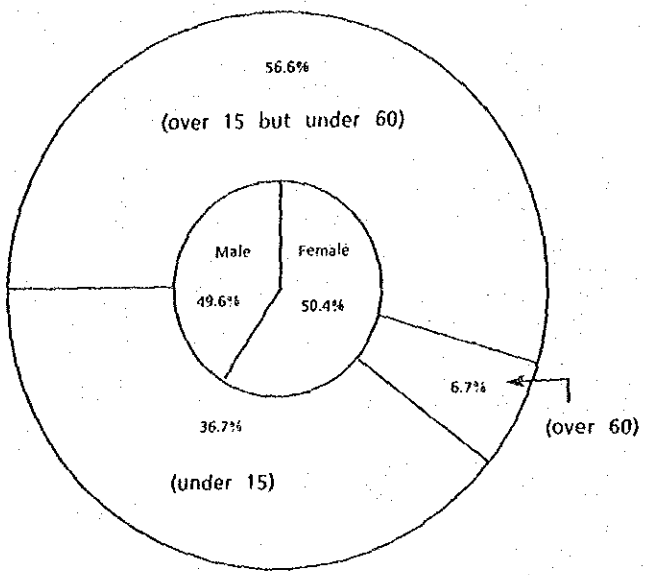
(Source: Ministry of Health)

A budget of 48 million Ks in total is allocated to hospital improvement programs under item numbers 1, 3, 4, 5, 6, 7, and 8 of Table 2-3, with the maximum budget per hospital being 3 million Ks. When these programs to increase the number of beds are fulfilled, the official number of available beds in the whole country will increase from the present number of 26,019 to 28,295. Since the total population is estimated to increase from 37,115,000 in 1985/86 to 41,432,000 in 1990, the number of available beds per 10,000 population will rather decrease from the present 7.01 to 6.83. As a matter of reference, the number of available beds per 10,000 population in Japan was 146.2 in 1984.

2-2 Health and Medical Situation in Burma

2-2-1 Composition of population

Statistics of 1985 show that the population of Burma was 37,115,000 with a total of 18,405,000 males and 18,710,000 females. As shown in Fig.2-3, 36.7% of whole the population is under 15 years old, 56.6% is over 15 but under 60 and 6.7% is over 60 years old.



(Source: Ministry of Health)

Fig.2-2 Composition of the population

The distribution of the population of 1984 is 10.2% in the urban area and 89.8% in the rural area. According to the estimation of population distribution of 1990, 23.9% will be urban and 76.1% will be rural. The ratio of population increase is expected to be 158% in the urban area from 1984 to 1990 while it is expected to be 12.6% for the entire country. Though a population increase ratio for urban area is higher than that for the entire country is expected, it can be said that the population structure of the country is still-rural oriented as a whole.

As indicated in table 2-4, Upper Burma including Mandalay Division has 36.4% of the whole population of the country.

Table 2-4 Distribution of the population

States/Divisions		Population (10Thou)	(%)
Upper Burma	Mandalay	446.4	12.7
	Magwe	319.5	9.1
	Sagaing	379.7	10.8
	Kachin	91.1	2.6
	Chin	40.2	1.2
	Total	(1276.9)	(36.4)
Lower Burma	Rangoon	387.6	11.0
	Irrawaddy	498.1	14.2
	Pegu	382.5	10.9
	Tenasserim	87.5	2.5
	Mon	159.9	4.6
	Total	(1,515.6)	(43.2)
East Burma	Kayah	15.5	0.5
	Karen	105.7	3.0
	Shan	387.3	11.0
	Total	(508.5)	(14.5)
West Burma	Rahkine	208.3	5.9
	Total	(208.3)	(5.9)
Grand Total		3,509.3	100.0

(Source: Health Information Booklet 1985, MOH)

2-2-2 Health and medical level

When internationally comparing the health and hygiene conditions in Burma by employing the mortality rate of infants and life expectancy as indices, it is found that the infant mortality rate of 40.5 in Burma is not included in the high rate group of from 104 to 156 found in Bangladesh, India, and Nepal, but rather in the group from 37.7 to 50.2 as in the Philippines and Sri Lanka and that same situation is found regarding life expectancy (Table 2-5).

Table 2-5 International Comparison of Birth, Death and Infant Mortality Rates (per 1,000)

Country	Birth Rate	Death Rate	Infant Mortality Rate	Average life	
				Male	Female
Burma (1980)	26.7	6.3	40.5	(83) 56.3	(83) 60.2
Philippines	33.9	7.7	50.2	(75) 56.9	(75) 60.0
Bangladesh	—	—	104.7	53.0	57.0
India (1980)	—	—	122	51.2	50.0
Nepal	—	—	156	42.5	45.0
Sri Lanka	28	6.0	37.7	(67) 64.8	(69) 66.9
Thailand	22.2	5.1	12.4	(60) 53.6	(60) 58.7
U.K. (1983)	12.6	11.7	10.8	71.3	77.4
W. Germany (1983)	10.1	11.6	10.9	70.5	77.1
Sweden (1984)	11.1	10.9	6.8	73.8	79.9
U.S.A. (1984)	15.9	8.5	11.5	71.1	78.3
Japan (1985)	12.8	6.0	6.6	74.8	80.5

(Source: Demographic Yearbook '85)

This fact is based on the improvement of primary health care in the People's Health Plan I and II, during which the infant mortality rate improved from the rate of 195 to 300 in 1952 to 40.5 in 1983 and the life expectancy was also enhanced from 48.6 to 56.3 for males and from 51.5 to 60.2 for females. When comparing these indices with those in the industrialized countries, however, there still exist substantial differences of 4 to 6 times in the infant mortality rate and 15 to 20 years in life expectancy. This means that more efforts should be made to upgrade the regional environment and hygiene such as improvement of water supply and sewerage system, proper guidance on nutrition and maternity health in addition to the training and re-education of doctors and personnel engaged in medical services and the improvement of health and medical facilities.

2-2-3 Composition of diseases

According to statistics on the morbidity of inpatient and outpatients in all the hospitals in Burma, infectious diseases such as malaria, ill-defined intestinal infections, pulmonary tuberculosis, and influenza

acoount for 20 to 30% of the total diseases, followed by pyrexia of unknown origin, diseases caused by pregnancy and puerperium, pneumonia, helminthiasis, and diseases of digestive system in that order (Table 2-6).

Table 2-6 Composition of diseases -- all of Burma (1982)

Causes of morbidity (Outpatient)		Causes of morbidity (Inpatient)	
1. Pyrexia of unknown origin	8.3%	1. Malaria	14.5%
		2. Normal delivery	7.8
2. Ill-defined intestinal infections	6.3	3. Ill-defined Intestinal infections	6.5
3. Supervision of Pregnancy puerperium	5.5	4. Pyrexia of unknown origin	4.2
4. Unspecified anaemias	5.5	5. Unspecified abortion	3.7
5. Bronchitis, emphysema & asthma	4.7	6. Pneumonia	2.5
		7. Traumatic complication	2.4
6. Malaria	4.6	8. Diseases of respiratory system	2.4
7. Pulmonary Tuberculosis	3.2		
8. Debility unspecified	3.1	9. Diseases of digestive system	2.2
9. Helminthiasis	3.0		
10. Infectious of skin & subcataneouse tissue	2.9	10. Bronchitis, emphysema & asthma	2.0

(Source: Health Information Booklet 1985, MOH)

Since therapeutic methods for these types of diseases have been established in modern medicine, these diseases can be cured with considerable ease and are preventable by improving the health and hygienic conditions from an epidemiological point of view. According to the 1982 statistics of the Ministry of Health, the above-mentioned infectious diseases still head the list of the causes of mortality (29.9%) with malaria occupying almost half (13.0%) of that figure (Table 2-7).

Table 2-7 Order of causes of mortality

	Mortality (Burma)	%
1	Infectious & parasitic diseases (Malaria 13.1, Tuberculosis 4.8 others)	29.9
2	Pregnancy & puerperium	15.2
3	Injury & poisoning	11.9
4	Diseases of respiratory system	9.2
5	Symptoms signs & ill-defined conditions	9.1
6	Diseases of the digestive system	6.2
7	Diseases of nervous system & sense organs	5.1
8	Diseases of genito-urinary system	4.5
9	Diseases of skin & subcutaneous tissue	2.4
10	Neoplasms	1.4

(Source: MOH)

	Mortality (Japan)	%
1	Noeplasms	26
2	Heart diseases	19.6
3	Cerebral vascular diseases	18.7
4	Pneumonia & Bronchitis	7.1
5	Injury & poisoning	4.1
6	Senility	3.9
7	Suicide	3.2
8	Liver cirrhosis	2.3
9	Nephritis, nephrotic syndrome	1.9
10	Hypertension diseases	1.8

(Source: The tendency of public hygiene, 1986)

Principal causes of mortality are compared between Burma and Japan in Table 2-7. Infectious diseases are the main causes of mortality in Burma, followed by puerperal diseases and accidents. Malignant neoplasm ranked at the 10th position (1.4%). In Japan, on the contrary, the first is malignant neoplasm (26%), the second, heart disease and the third, cerebrovascular diseases. Infectious diseases are not ranked within the top 10 which occupy 88.6% of the total causes of mortality, thus

indicating a striking difference from the situation in Burma.
Comparisons of these features by adding the statistics of the Philippines, Thailand, and United Kingdom to the statistics of Burma and Japan are shown in Fig.2-3.

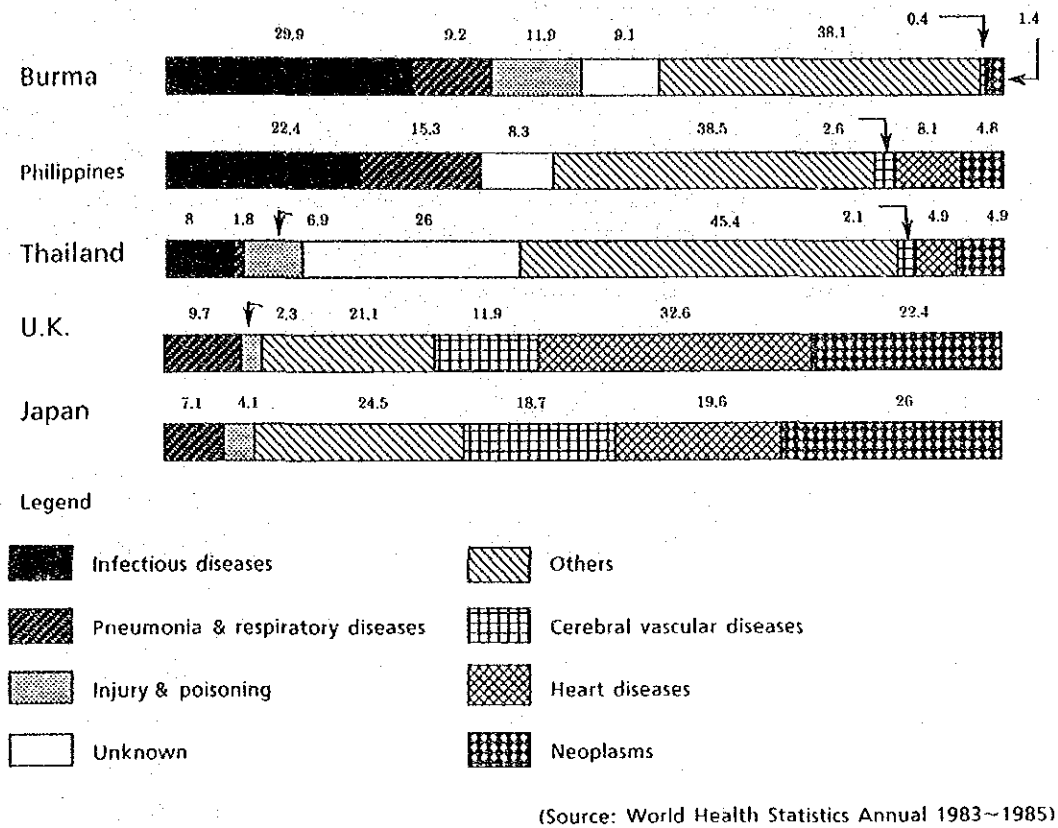


Fig. 2-3 International comparison of causes of mortality

Fig. 2-3 suggests that infectious diseases, pneumonia, and accidents involving toxicity have higher rates in the causes of mortality in developing countries, while those diseases which require advanced treatment techniques such as malignant neoplasm and heart disease prevail in the industrialized countries. In other words, when considering the correlation among such factors as medical service levels, composition of diseases (including those of mortality) and medical demands, it is found that in those countries when the medical service level is high, diseases which require more sophisticated medical techniques rank higher as causes of mortality and that consequently, medical demands tend to be for more

specialized and advanced services. In those countries where the medical service level is low, on the other hand, diseases which can be cured with relatively simple treatments rank higher in the composition of diseases, and medical demand tends to be at rudimentary levels.

Judging from the aforementioned composition of diseases prevailing in Burma and based on the correlationship stated above, it is concluded that the measures which should be taken to improve the medical services in this country are to educate and to appropriately distribute medical personnel who can cope with a wide range of community medical requirements after mastering the basics of modern medical knowledge and skill, as well as to establish basic medical service systems throughout the country as opposed to specialized, advanced medical service systems.

2-2-4 Medical services level

The present level of medical services in Burma is compared with the world-wide situation by employing the number of available beds, doctors, pharmacists, and nurses (Table 2-8) as indices.

To compare degrees of medical services among countries in terms of the number of available beds, doctors, dentists, pharmacists, and nurses per 10,000 population (Fig.2-4), Burma has 7.01 beds compared with the 85 to 148 beds in industrialized countries and 2.6 doctors compared with the 14.9 to 22.6 in the industrialized countries. The Burmese ratios of medical personnel compared to the above mentioned industrialized countries is 1:6 to 1:9 for doctors, 1:30 to 1:60 for dentists and nurses and 1:300 to 1:450 for pharmacists.

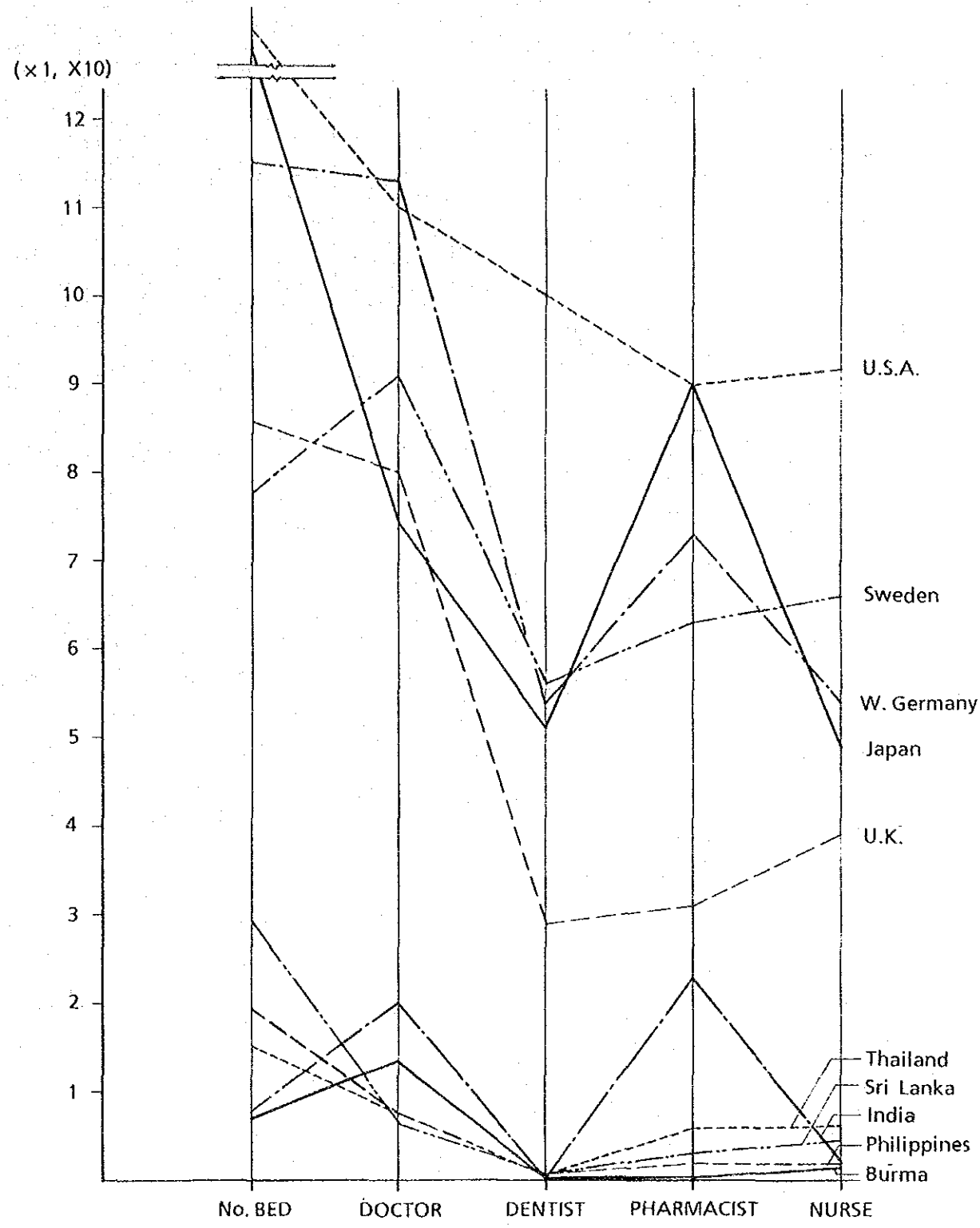


Fig. 2-4 International comparison of medical services
(per 10,000 population)

Table 2-8 International comparison of medical service levels

	Population (thousand)	Bed (bed/doctor)	Doctor	Pharmacist	Nurse	Year
Burma	36,392	26,019 (2.6)	10,031	69	6,560	1984
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
U.K.	49,607	420,943 (5.4)	78,649	15,349 G	192,992 G	1979
W. 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)

Following Table (Table 2-9) shows progress in the number of health and medical facilities and health personnel in Burma. As seen in this Table, no health facilities were constructed from 1982 at the end of the Third Four-year Plan to 1984 in the Fourth Four-year Plan (1982/83 to 1985/86), and no changes were seen for these four years in the number of hospitals, rural health centers, maternity health centers, and other medical facilities nor in the number of doctors, nurses, and other health personnel working there.

Table 2-9 Progress in the number of health facilities and health personnel

	Particulars	1981/82	1982/83	1983/84	1984/85	1985/86
1	2	3	4	5	6	7
1	Hospital	620	620	620	620	631
2	Beds	25,379	25,379	25,379	25,379	26,019
	(per 10,000 population)	7.40	7.26	7.11	6.97	7.01
3	Dispensaries	47	47	47	47	47
4	Rural Health Centers	1,267	1,267	1,267	1,267	1,337
5	Maternal & Child Health Centers	336	336	336	336	348
6	Primary & Secondary Health Centers	62	62	62	62	64
7	School Health Team	72	72	72	72	80
8	Indigenous Medicine Dispensaries Centers	89	89	89	89	89
9	Doctors	7,831	8,381	8,931	9,481	10,031
	(Public)	4,728	4,898	4,902	4,905	5,223
	(Co-operative & Private)	3,103	3,483	4,029	4,576	4,808
	(per 10,000 population)	2.28	2.39	2.50	2.61	2.70
10	Dental Surgeon	411	471	531	591	630
	(Public)	349	376	376	376	401
	(Co-operative & Private)	62	95	155	215	229
11	Health Assistants	1,300	1,300	1,300	1,300	1,346
12	Health Supervisors I	461	461	461	461	481
13	Dental Nurses	36	36	36	36	86
14	Lady Health Visitors	1,401	1,401	1,401	1,401	1,567
15	Nurses	5,315	5,326	5,335	5,332	5,560
	(per 10,000 population)	1.55	1.52	1.50	1.47	1.50
16	Midwives	7,831	7,831	7,831	7,831	8,187
17	Practitioners	359	369	369	369	369
18	Health Supervisors II	363	363	363	363	673

(Source: Peport to Pyithu Hluttaw 1986/87)

With reference to the medical education system in Burma, a fixed number of doctors and health personnel have been trained every year according to the existing education system, although the number of medical facilities for which they would have been expected to work has not been increased at all. As a result, most graduates of the institutes of medicine and the dental college who found it difficult to work for the national or other public hospitals chose to work for private clinics under personal or joint management. Since these private clinics have been concentrated in the urban areas, especially, in or near Rangoon, where more medical services are demanded, the regional maldistribution of medical services has been further exacerbated.

Table 2-10 Comparison of present medical services available in Rangoon and Mandalay

	Rangoon	Mandalay
Teaching Hospital	13	3
Beds for Clinical Practice	6,150	1,050
Doctors	1,071	310
Pharmacists	27	8
Paramedicals	373	81
Nurses	1,368	411
Population	3,972	4,509

(Source: Health Information Service 1984, MOH)

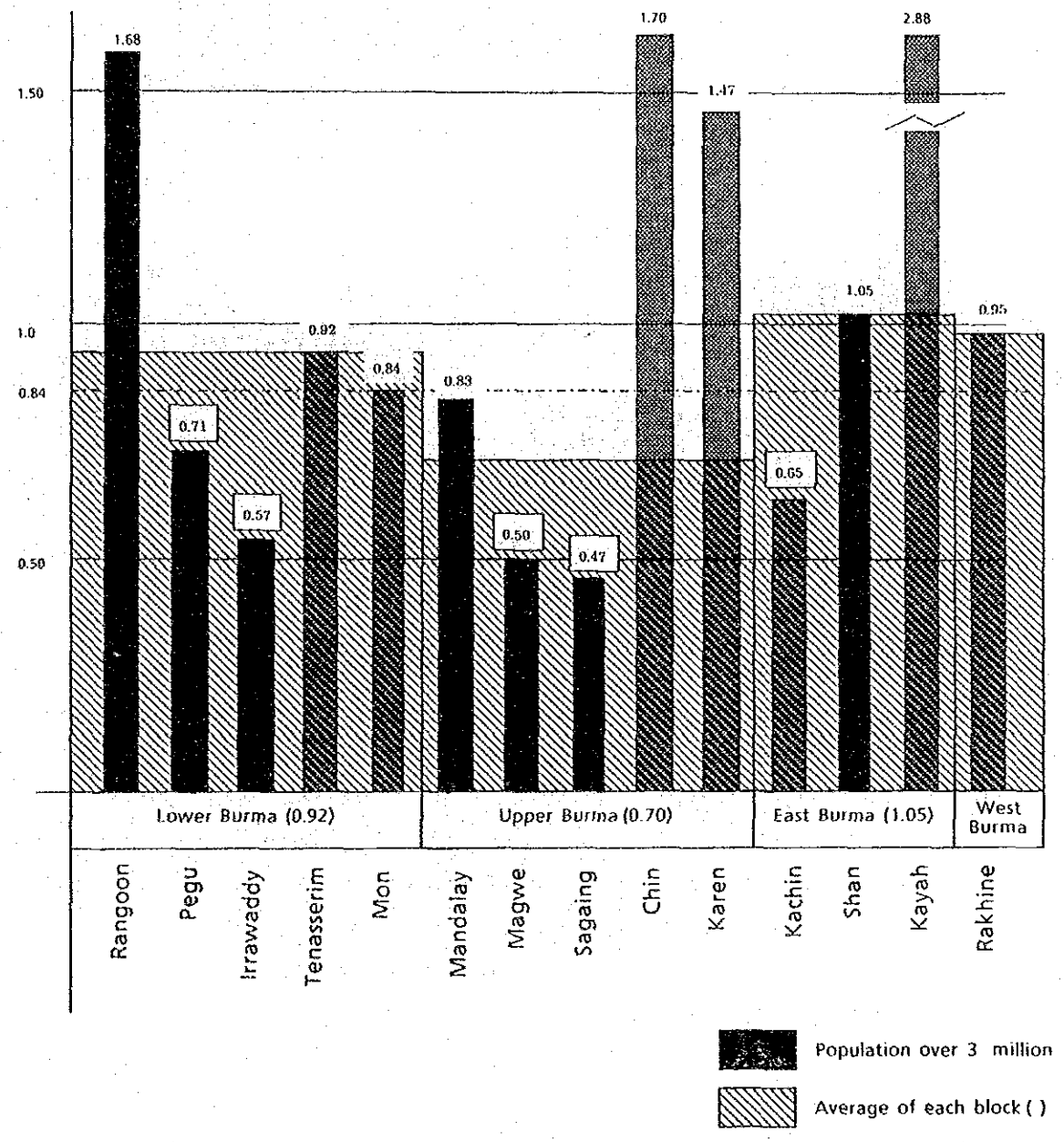
The maldistribution of medical facilities, especially that of hospitals, constitutes one of the principal factors which cause regional differences in medical services. Table 2-11 shows the number of hospitals and beds available in each division and state of Burma, and the number of available beds per 1,000 population in this table is illustrated separately in Fig. 2-5.

Table 2-11 Number of hospitals and beds available in each district (1981)

Division/States	Population in thousand	Hospitals	Available Beds	Available Beds (per 1,000)	Population Density (per sq. mile)
Rangoon	3,876 (11.0)	47	6,512	1.68	987
Pegu	3,825 (10.9)	51	2,706	0.71	251
Irrawaddy	4,981 (14.2)	47	2,843	0.57	367
Tenasserim	875 (2.5)	20	805	0.92	52
Mandalay	4,464 (12.7)	50	3,712	0.83	312
Magwe	3,195 (9.1)	42	1,599	0.50	185
Sagaing	3,797 (10.8)	61	1,779	0.47	104
Mon	1,599 (4.6)	18	1,344	0.84	337
Rakhine	2,083 (5.9)	28	1,987	0.95	148
Karen	1,057 (3.0)	15	687	0.65	90
Shan	3,873 (11.0)	74	4,049	1.05	64
Kayah	155 (0.5)	13	446	2.88	34
Chin	402 (1.2)	16	682	1.70	29
Kachin	911 (2.6)	32	1,338	1.47	26

(Source: Health Information Service 1985, MOH)

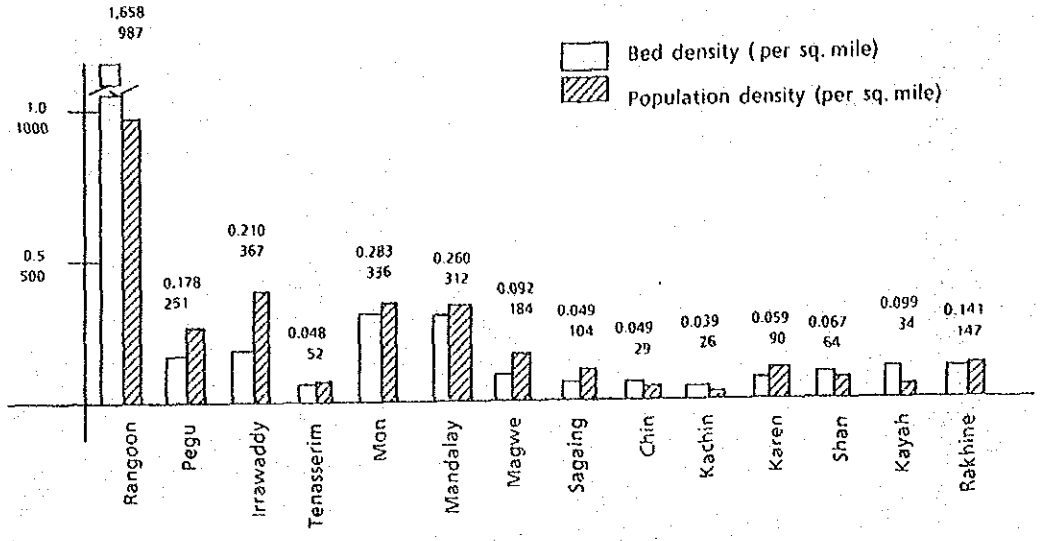
Among the divisions and states whose population exceeds three millions, Rangoon, which is the leading division of Lower Burma, has 1.68 beds per 1,000 population, far above other divisions and states and more than twice the figure for Mandalay which is the leading division of Upper Burma.
When comparing the mean value among the blocks, Upper Burma alone shows a value of 0.70, below the average of the four blocks, while the remaining three blocks, namely, East, West, and Lower Burma have almost the same values of from 0.92 to 1.05.



(Source: Health Information Booklet 1985 1985、MOH)

Fig. 2-5 Comparison chart of the number of available beds in the divisions and states

Figure 2-6 indicates the number of available beds per unit area in the divisions and states for the purpose of judging the availability of medical services in the divisions and states in terms of the availability of hospital beds. Like the density of population, that of medical services is highest in Rangoon, indicating striking differences between it and other divisions and states among which the differences in turn are relatively small.



(Source: MOH)

Fig. 2-6 Number of total available beds per unit area among division and states (beds/square miles)

Comparison of available beds alone is an insufficient index of the maldistribution of hospitals. To indicate this properly, studies must be done to compare the medical service levels of the hospitals, such as their medical facilities, medical equipment, and quality and quantity of doctors, nurses, and other persons engaged in medical services. An attempt is made to compare regional differences in the quality of medical services by using the numbers of specialized hospitals, general hospitals, and township hospitals (with 50 beds or more) whose levels of medical services are relatively high (Fig. 2-7)

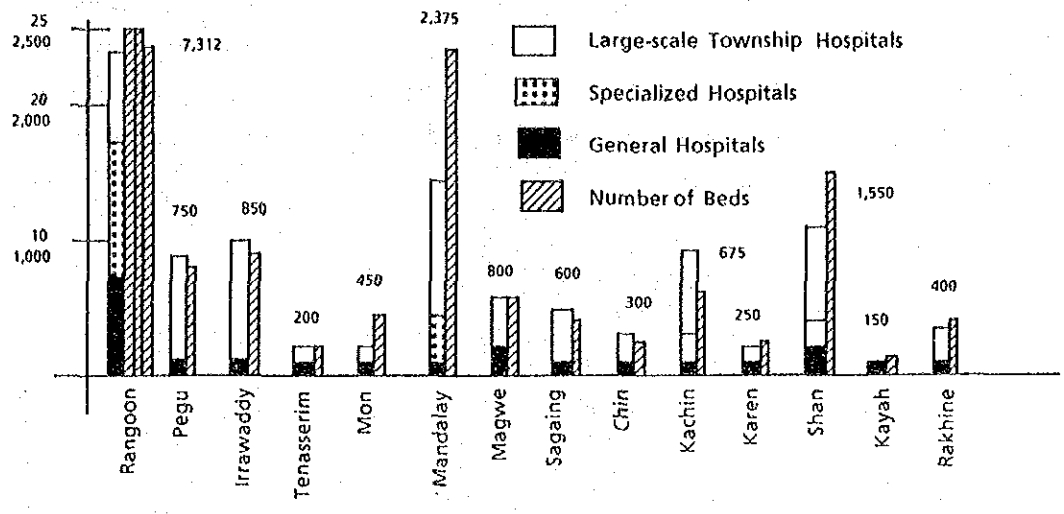


Fig. 2-7 Number of large-scale hospitals per unit area in the divisions and states (beds/square miles)

As Fig. 2-7 clearly indicates, the numbers of large-scale hospitals and of available beds in Rangoon are by far higher than those in other divisions and states, showing a remarkable difference between Rangoon and the others. It is also found that large-scale hospitals with higher levels of medical care and more available beds are concentrated in Mandalay Division and Shan State which are the leading division and state in Upper Burma and East Burma, respectively.

2-2-5 Health and medical system

The Ministry of Health of the Government of Burma intends to provide all Burmese people with uniform medical service by introducing a referral system which aims at the completion of a comprehensive health organization based mainly on primary health care.

In accordance with their degrees of specialization, scales, and medical service areas, the total of 631 hospitals belonging to the Ministry of Health are divided into the four stages of 1) specialized hospitals at the national, divisional, or state levels, 2) general hospitals at the national, divisional, or state levels, 3) large-scale township hospitals and 4) small-scale township hospitals and station hospitals at the town or village levels. Under this hospital system, 1,712 health centers not

possessing the facilities to accept inpatients are distributed throughout the urban and rural areas, thereby composing the nation-wide referral system. At the same time, the referral system based on regions, divisions and states has also been adopted by dividing the country into two regions, Lower Burma with Rangoon as the core and Upper Burma with Mandalay as the core.

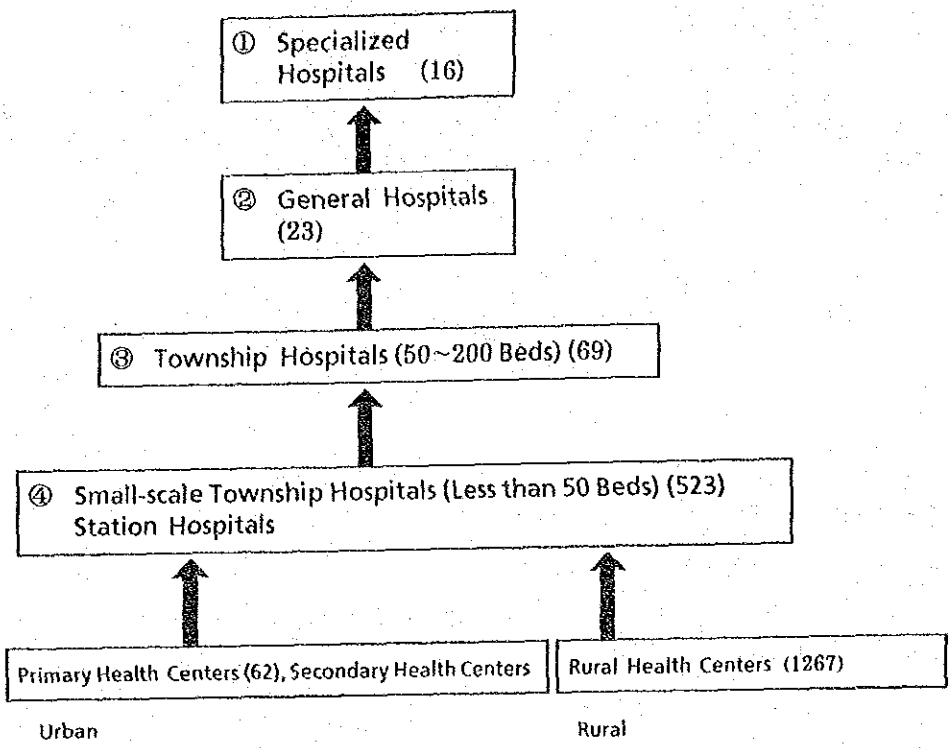


Fig. 2-8 Health referral system in Burma

- Referral system in Upper Burma

A referral system headed by the Mandalay General Hospital (MGH) is adopted, in Upper Burma, which contains a population of 12.77 million or about 36.4% of the total in Burma,

Upper Burma is composed of five divisions and states, namely, Mandalay Div., Magwe Div., Sagaing Div., Chin State, and Kachin State. The division and state-level medical referral systems headed by their respective general hospitals are reorganized into a regional referral system which is constructed as a 5-stage pyramid as illustrated in Fig. 2-9 below. The standard of medical treatment is being upgraded step by step from health centers ranked at the bottom to station hospitals, township hospitals, division (or state)-level general hospitals, and the Mandalay

General Hospital which is positioned at the top of the system and is supported by hospitals specialized in Eye, Ear, Nose and Throat (EENT), leprosy and infectious diseases. However, the Mandalay General Hospital (MGH) is equipped with rather obsolete facilities and equipment and admits substantially more inpatients than the number of beds officially registered.

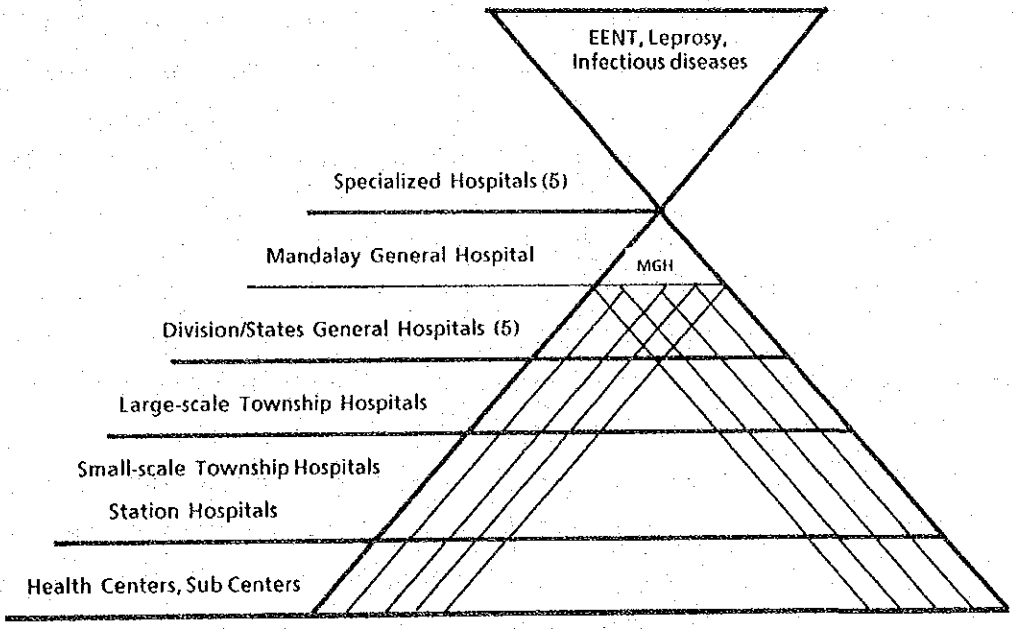


Fig. 2-9 Referral system in Upper Burma

The present referral system has not functioned as satisfactorily as expected due to a shortage of personnel, facilities, and equipment. It is necessary, therefore, to fully establish this referral system for the purpose of attaining the goal of the People's Health Plan (PHP) which is described in article 2-1-2.

2-3 Medical Education in Burma

2-3-1 Brief history of medical education

After the shift of government in 1962, the higher education system was reviewed. In 1964 the faculty of medicine belonging to Rangoon University was separated from the University. Three Institutes of Medicine were constituted under the Ministry of Education, namely, the Institutes of Medicine, Rangoon I and II and the Institute of Medicine, Mandalay, with five-year courses of study. A Dental College was established at the same time.

It is preferable to manage a teaching hospital under the control of the Ministry of Education exclusively for clinical practice to furnish students with opportunities for such practice. Since it is practically difficult in Burma to establish such a system, clinical practice has been carried out at hospitals under the control of the Ministry of Health. This means that staff of the Institutes of Medicine belonging to the Ministry of Education and hospital staff belonging to the Ministry of Health are mixed in a hospital, sometimes preventing smooth operation of the hospital.

In 1973, therefore, the above-mentioned three Institutes of Medicine and the Dental College were transferred from the Ministry of Education to the Ministry of Health to clarify the organization and to enhance efficiency in medical education. In 1974 the Dental College was upgraded to the level of Institute.

2-3-2 Targets of medical education

Medical education in Burma was once based upon the British style medical education system as to the classifications of doctors and stepwise promotion up to specialized doctorship. Since the establishment of the Burmese Socialist Government, the top priority in medical education has been placed on educating so-called grass roots doctors who will contribute to the improvement of primary health care. The Ministry of Health has placed the aim of medical education for undergraduate students on producing doctors of family doctor type, rather than specialists, who

possess basic knowledge in every field of medicine and are equipped with the capabilities mentioned below:

(a) To acquire sufficient medical knowledge and skill to be trusted by community people and to deal with the problems of community health and hygiene as well as of curing common diseases in Burma.

(b) To be capable of studying by themselves and being further trained when there occurs a need to specialize themselves in a certain medical field in the future.

(c) To be deeply concerned with the social conditions of medicine with which preventive medicine and therapeutic methods will be confronted.

(d) To have those professional attitudes and ethics of doctors which the majority of community people expect them to have.

When considering the aforementioned present situation of levels and regional differences of medical services, and the composition of diseases prevailing in Burma, these targets of education are considered to be reasonable since they certainly meet the demands of the times and take into account the diffusion of modern medicine to rural areas in Burma in the future.

2-3-3 Present status of medical education

The primary and secondary education system in Burma is composed of 5 years in primary school (including one year for infant education), 4 years in lower secondary school, and 2 years in upper secondary school, totaling 11 years. The ratio of attendance is 87% for primary school, 24% for lower secondary school, and 10% for upper secondary school. Almost all of the approximately 35,000 upper secondary school graduates enter universities or colleges, but those who gain admission to the three institutes of medicine number 550, less than 1.6% of the total graduates. The number of students in Burma who desire admission to these institutes of medicine is large, and the academic attainments of the students of these institutes are very high compared to Burmese students as a whole. Although there is not such a great difference in population between Rangoon and Mandalay division, the number of admissions to these three institutes is

disproportionally larger for Rangoon. As previously described, there are great differences in the levels of medical services between Rangoon and Mandalay and there has been a tendency for more doctors to be concentrated in Rangoon. In 1986, the Ministry of Health planned to shift 50 seats out of the total of 400 in the Institutes of Medicine, Rangoon I and II to the Institute of Medicine, Mandalay (IMM), thereby increasing the number of admissions to the IMM from 150 to 200.

Table 2-12 Number of admissions to the Institutes of Medicine

	Original	Proposed
Institute of Medicine, Rangoon I	250	200
Institute of Medicine, Rangoon II	150	150
Institute of Medicine, Mandalay	150	200
Total	550	550

(Source: MOH)

The Institute of Medicine, Mandalay, has been carrying out clinical practice at the Mandalay General Hospital (MGH) (whose number of officially registered beds is 800) and the EENT Hospital (whose number of available beds is 100). When compared with the 6,150 educational beds available in Rangoon, however, the number of educational beds applicable to clinical practice in Mandalay is no more than 1,050 beds, even including the 150 beds of the Worker's Hospital which is now under construction, clearly indicating a shortage of beds for clinical practice. In addition, the medical facilities and equipment used in the Mandalay General Hospital have become comparatively old. Since the Hospital is situated in the central area of Mandalay, the ground space is so limited that there is no room for planning a large scale extension of the buildings. Since the above-mentioned increase in the number of the IMM students was decided under these circumstances, there has been a need to expand clinical practice facilities in order to provide those which should be furnished to undergraduate and postgraduate students of the IMM and also to nurses and midwives in and around Mandalay.

The present status of medical education for persons engaged in medical services and plans to increase the number of such persons by 1990 are listed in Table 2-13. As shown in Table 2-9, the number of doctors was increasing by 550 every year, reaching 10,031 in 1985/86, but it

represents no more than a ratio of one doctor per 3,700 population, because the total population is presumed to be 37,115,000. In 1990, the number of doctors will reach 12,781 (10,031+550×5), but the ratio of doctors to total population will still only be one doctor per 3,241 population since the total population is anticipated to be 41,431,761 in that year. The ratio of doctors to the population in industrialized countries is one to 400-700 population. Considering the fact that, unlike industrialized countries, the population still continues to increase in Burma, the number of students admitted to the Institutes of Medicine is not excessive. Table 2-13 indicates that efforts are made on the education of midwives and public health supervisors, and this may be said to meet the present circumstances in Burma where the ratio of births outside hospitals is high (57.73% in 1980, MOH) and where regional infectious diseases frequently occur through lack of knowledge concerning community hygiene. The reason why the number of paramedics being trained is small lies in the fact that Burma adopted a system to train them in medical facilities, whenever required with no periodical courses, in accordance with plans to introduce medical facilities and equipment. Out of the 150 nurses admitted, 80 are trained in a nursing school in Mandalay and out of the 450 midwives admitted, 85 are trained in two midwife schools in Mandalay.

Table 2-13 Present status of medical education in Burma

Categories	Institutions	Education Period	Admission		Graduates	
			1984	1990	1984	1990
Medicine	3	6.5years	550	←	500~550	←
Dental Medicine	1	6years	60	←	50	←
Paramedical						
(1)Pharmacist	1	2years	4	—	4	—
(2)Radiographer	1	2years	6	—	6	—
(3)Medical Technologist	1	2years	8	—	8	—
(4)Physiotherapist	1	2years	4	—	4	—
Nursing	7	3.5years	150	—	150	—
Lady H. Visitors	1	9month	55	—	55	—
Midwifery	16	1.5years	450	—	450	—
Dental Nurse	1	3years	20	—	20	—
Dental Tech.	1	3years	12	—	12	—
Ayurveda	1	3years	30	—	30	—
Training Course						
Public H. Supervisor I	1	9month	50	—	50	—
Public H. Supervisor II	1	9month	300	—	300	—
Compounder	OJT in Hospital	1years	30	—	30	—
Vaccinator	1	3month	55	—	55	—
Lab. Tach. I	1	2years	25	—	25	—
Lab. Tech. II	1	1years	37	—	37	—

(Source: Ministry of Health)

2-4 Health and Medical Administration

2-4-1 Organizational setup of the Ministry of Health

The Ministry of Health is composed of the four Departments of Health Services, Medical Education, Medical Research, and Physical Culture. The Department of Health, which is an implementation organization of this project, is composed of the five Divisions: Hospital Care, Disease Control, Public Health, Laboratory, and Administration Personnel Training.

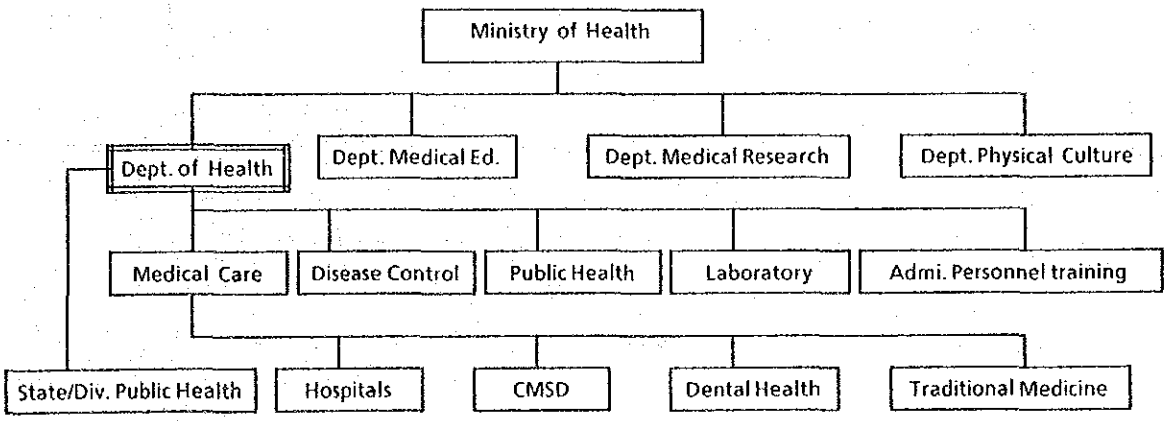


Fig. 2-10 Organization chart of the Ministry of Health

2-4-2 Functions of the Department of Health

The Department of Health takes charge of operations related to hospital care, disease control, public health, and testing and inspection under the jurisdiction of the Ministry of Health throughout Burma. Presently a total of 631 hospitals are controlled under the jurisdiction of the Ministry of Health and are roughly classified in respect to their scales and specialities into 16 specialized hospitals (paediatrics, gynaecology, EENT, infectious disease, and so on), 23 general hospital, 69 large-scale township hospitals (with 50 to 200 beds), 218 small-scale township hospitals (with 16 - 50 beds), and 305 station hospitals. Four sections under the Hospital Care Division, namely Hospitals, Central Medical Store Depot (CMSD), Dental Health and Traditional Medicine are in charge of

controlling the administration and pharmaceutical supply of the above-stated hospitals.

2-4-3 Current situation of pharmaceutical supply

(1) Central Medical Store Depot (CMSD)

The Central Medical Store Depot is under the control of the Hospital Care Division of the Department of Health, and is in charge of supplying pharmaceuticals, medical equipment, consumables, linens, and related items to the hospitals under the control of the Ministry of Health three times a year. The supply quantity is determined in accordance with the official number of beds and the functions of the hospitals.

The ratio of the volume of domestic to foreign procurement of pharmaceuticals is approximately 6:4. The principal source of domestic procurement is the Burma Pharmaceutical Industry (BPI). Foreign procurement is carried out by means of loans, grant aid cooperation, and the foreign currency budget of Burma. However, foreign currency allocated for this purpose by the budget has been reduced year after year and amounts to only 2% of the present foreign procurement while procurement through foreign loans is increasing.

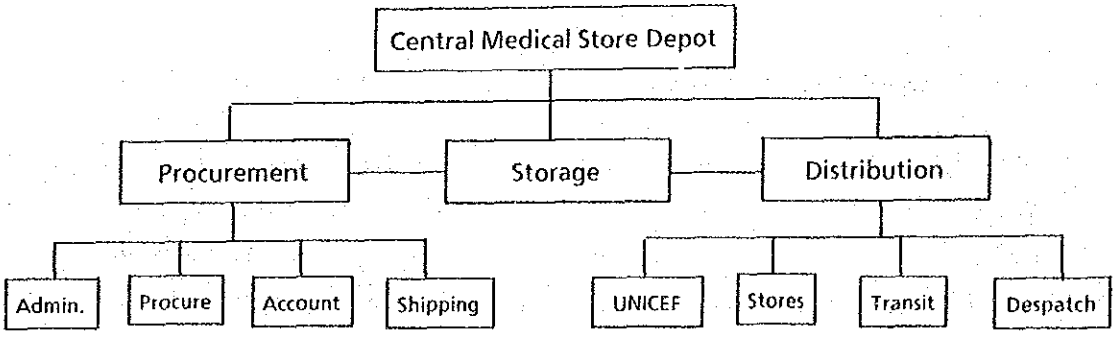


Fig. 2-11 Organization chart of the Central Medical Store Depot

(2) Burma Pharmaceutical Industry (BPI)

The Burma Pharmaceutical Industry (BPI) belongs to the Ministry of Industry and produces about 50% of the pharmaceuticals consumed in Burma. The BPI is composed of administration, research, tablet production, liquid medicine, injection production and serum production departments with the

staff amounting to 2,300 (including 20 pharmacists). The total number of pharmaceutical types produced is about 180, composed of about 60 types of tablets and capsules including antibiotics, 30 types of liquid medicines, 60 types of injections, and 30 types of serums. Pharmaceuticals thus produced are supplied to the Central Medical Store Depot, Trade Corporation, the Army, the Social Security Department, and so on. Antibiotics produced in the BPI are of four types, namely, penicillin, tetracycline, chloramphenicol, and ampicillin. The number of tablets and capsules of antibiotics produced is approximately 42 millions (as of 1985) of which 63% are supplied to drugstores through the Trade Corporation and 29% are supplied to the Central Medical Store Depot of the Department of Health.

However, the supply volume of domestic production and imports from foreign countries is not necessarily sufficient, thereby resulting in a constant shortage of pharmaceuticals. As a matter of information, the annual consumption of pharmaceuticals per capita in Burma is US$0.52, about 1/283rd that of Japan where US$147 is consumed. This ratio is about 1:8 when compared with neighboring countries such as the Philippines and Thailand.

2-5 Background and Details of the Request

PHP-III is under way in Burma, but the health and medical level in the country is rather low when compared with levels in industrialized countries. Moreover, substantial regional differences are found in health and medical services between Rangoon and rural areas.

Mandalay is the central city of the vast area with a population of about 13 million which is called Upper Burma and which expands over the plain along the upstream area of the Irrawaddy River. It is also the center of the medical administration of Upper Burma. In Mandalay, however, the number of medical facilities is far smaller than in Rangoon, with the number of available beds being 3,712 in Mandalay division to 6,512 in Rangoon, and the number of beds per 1,000 population being 0.83 beds in Mandalay, less than half the number in Rangoon, 1.68 beds.

Referring to medical education, the students admitted to the three Institutes of Medicine of the country (in Rangoon and Mandalay) number 550 in total for each school year. However, admissions are allocated unevenly with 400 going to the Institute of Medicine, Rangoon I and II and 150 to the Institute of Medicine, Mandalay. In addition, the number of educational beds to be used for clinical practice is insufficient in Mandalay. Mandalay General Hospital, which should be the center of clinical practice, actually contains 1,000 to 1,300 inpatients in spite of the fact that the nominal number of beds is 800 and it is equipped with rather old medical equipment and facilities. Proper medical education might not always be given under these circumstances in Mandalay.

The Government of Burma decided to increase the number of students in the Institute of Medicine, Mandalay, from 150 to 200 to reduce the difference mentioned above. At the same time the Government planned to establish a teaching hospital in the City of Mandalay for the purpose of furnishing opportunities for clinical practice at the Institute and for the training of nurses and midwives as well to contribute to the improvement of medical services in the whole of Upper Burma. The Burmese Government then requested of the Japanese Government grant aid cooperation for the construction of the said Teaching Hospital as well as technical cooperation, since Japan possesses advanced techniques in the field

concerned and has cooperated in the construction of a general hospital in the City of Rangoon.

The outline of the original request made by the Burmese side was described as follows:

1. Objectives

To construct a hospital which possesses the functions of a teaching hospital and a general hospital with about 318 beds to increase opportunities for clinical practice for undergraduates and postgraduates of the IMM and to be utilized as a facility for training students of nursing and midwife schools. As a general hospital it should cover the four disciplines of internal medicine, surgery, obstetrics and gynaecology, and paediatrics and should also include diagnosis and treatment sections related to these disciplines. The hospital is scheduled to become a modern medical facility as one of the central referral hospitals in Upper Burma.

2. Implementing agency: Department of Health, Ministry of Health

3. Proposed construction site: Southeastern area of the City of Mandalay
Site area: 72.4 acres (approx. 29 ha)

4. Facilities

(1) Patient Ward:
Inpatient wards for internal medicine, surgery, obstetrics and gynaecology, and paediatrics. The number of beds should be 78 for each ward, or 312 in total.

(2) Outpatient Service Dept.:
General outpatient clinic, specialist referral clinic, accident and emergency, observation, medical record, patient waiting hall, dispensary, pharmacy, outpatient diagnostic facilities, etc.

(3) Central Diagnosis and Treatment Dept.:
Operation theaters, central sterilizing supply, laboratory, radiology, ICU (4 beds), CCU (2 beds), physiotherapy, blood bank, mortuary, and post-mortem, etc.

(4) Administration Dept.:
Administrative offices, medical staff offices, etc.

(5) Service Dept.:
Maintenance and repair workshop, kitchen, laundry, garage, etc.

(6) Teaching Facilities:
Gymnasium, auditorium, lecture rooms, research facilities, reference library, staff offices, laboratory, tutorial cum seminar room, and students' common room.

(7) Others Facilities:
Library, resting rooms for medical staff, conference room, recreation room, hospital canteen, and residential facilities

5. Equipment

Medical equipment, spare parts, consumables, reagents, etc. required for a teaching hospital with about 318 beds will be supplied. The types of equipment should be based on those which are related to internal medicine, surgery, operating room, emergency, anaesthesia and recovery, gynaecology, delivery, paediatrics, ward, central sterile supply, pharmacy, radiology, clinical laboratory, blood bank, autopsy room, conference room, and so on which are listed in the basic design study report of the New Rangoon General Hospital built with the grant aid cooperation of Japan, and it was requested that the types and the number of equipment should be further studied at the stage of the basic design study. However, no concrete list of equipment was attached to the form of the request.

At the time of the preliminary survey in November 1986, the Burmese Government submitted a document describing the results of its review of the facilities and equipment for the above-mentioned request. The document indicated that the CCU in the central diagnosis and treatment department, the gymnasium in the teaching facilities, and the recreation room in the other facilities had been deleted. A more concrete list of required equipment was submitted for further reference.

CHAPTER 3
CONTENTS OF THE PROJECT

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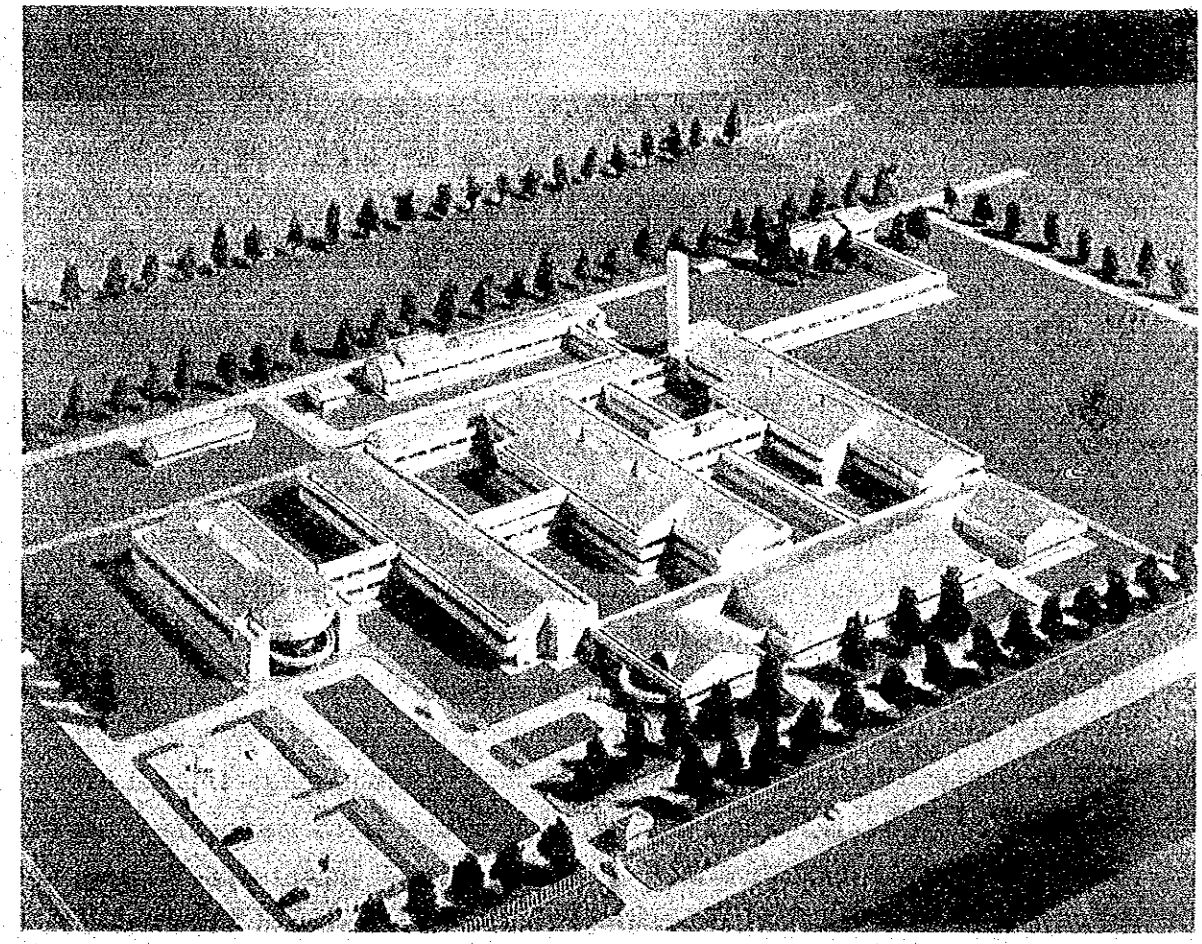
3-1 Objectives

The objective of the project is to construct a teaching hospital with Japanese grant aid, having 318 beds and fulfilling the functions of a general hospital in a southeastern part of the city of Mandalay. The hospital should function as one of the principal referral hospitals in Upper Burma, and strengthen the clinical teaching facilities for the Institute of Medicine, Mandalay. The hospital is expected to support the improvement of medical education and medical services in Upper Burma and, through upgrading the level of community health services, to contribute to the enhancement of the entire medical infrastructure in Burma.



3-2 Review of the Request

In view of the urgent need for improvement of the medical services in Upper Burma and the promotion of medical education in Mandalay, as stated in Chapter 2, the construction of this teaching hospital is considered to be necessary. With reference to the content of the Request, the considered objectives of the Project and the functions of the Hospital are held to be reasonable, but the following points have been reviewed as to the proposed scale, contents of facilities and equipment.

(1) Scale

The People's Health Plan-III (PHP-III) which started in 1986 contains a program to establish a new 300 bed general hospital in the City of Mandalay to enhance the medical service level in Upper Burma, but it has not yet been realized. The Burmese side has requested that the Mandalay Teaching Hospital should have 318 beds so that the construction of the teaching hospital may substitute for that of the said 300 bed general hospital.

The scale of this Hospital should be based on the estimated number of male and female patients within the areas served by the Mandalay General Hospital and this Project Hospital, and also on the estimated number of referral patients (out-patients and their average number of visits to hospital, and in-patients and the average duration of stay) who may be unable to receive diagnosis and treatment at township hospitals and may need to be accepted by the Mandalay General Hospital and this Hospital. Actually, however, facts indicate this has not been done.
For instance, the number of hospital beds per 10,000 population in the Mandalay Division is as small as 8.3, one-eighteenth the figure for Japan. Obviously, beds are insufficient to meet the needs of patients, however seriously ill they may be.
More specifically, the Mandalay General Hospital, the top hospital in the Upper Burma referral system, which has a nominal 800 beds, in fact cannot but accept 1,000 to 1,300 inpatients, using corridors as patient wards. It is presumed that the numbers of outpatients and inpatients at hospital in Burma depend simply on the capacity of the hospital and do not reflect actual demand or the number of patients.

If the Mandalay General Hospital and this Hospital should have to meet the requirements of all future patients in Upper Burma, the scale of this Hospital would have to be tremendously large, even beyond realistic expansion, if the current levels of hospital administration capacity and operational budget in Mandalay are taken into account. So far there are no other plans to build large-scale hospitals in Mandalay or Upper Burma. Consequently, as far as this project is concerned, it is reasonable to determine the number of beds, which is a fundamental factor in the facility's scale, in view of the Hospital's expected contribution to medical education and the operation and administration of the Hospital as a teaching hospital, and not from the viewpoint of the Hospital's capacity to meet patient demands.

1) Medical Disciplines

At present, Burmese general hospitals have the four basic medical disciplines of internal medicine, surgery, obstetrics and gynaecology, and paediatrics, and cope with diseases in other categories in one of these four disciplines. For the time being, until the Burmese medical level is furthered, it would not be practical to subdivide the fundamental four disciplines unnecessarily. It is also deemed reasonable for this Hospital to have these four basic disciplines.

2) Medical Units and Number of Beds

The government of Burma has requested 1 medical unit (78 beds) for each of the said 4 Disciplines. If 1 medical unit consists of 2 nursing units, the number of beds per nursing unit would be 39. Currently, the Mandalay General Hospital is in handling around 78 beds per 1 medical unit. The standard number of beds per nursing unit for teaching hospitals in Japan is 30 to 40 (according to the guideline for university hospitals of the Ministry of Education). The requested scale of 78 beds per medical unit coincides with the present actual scale of the Mandalay General Hospital and, when the requested staffing plan and operation budget are considered, or even when examined from a general point of view, it is regarded as reasonable. For hospital management, each medical discipline will require at least one medical unit; consequently, for this Teaching Hospital, 312 (78×4) general beds will be necessary. In addition, 6 special care beds which are required for

a general hospital with 312 beds should be added. Thus, a total of 318 beds is the minimum requirement for this Teaching Hospital.

3) Necessary Number of Beds for Clinical Practice

Clinical education for the Institute of Medicine, Mandalay, has been conducted at the Mandalay General Hospital (nominal capacity 800 beds, actually 1,000 to 1,300) and EENT Hospital (100 beds). Even when Workers' Hospital (150 beds) and this Teaching Hospital (318 beds) are taken into account, the number of beds for clinical practice per student is as small as 2.86 (1,150+100+150+318/200×3). However, the significance of the number of beds in a teaching hospital lies in affording ample opportunities for every student to experience a variety of diseases. In Burma, the average duration of stay in hospital is 8.7 days. So, the number of studies on inpatient cases per student in this Teaching Hospital will be as much as 10, on average, per month (365÷8.7×2.86/12=9.99).

Consequently, the education of general doctors as aimed at by the Burmese medical education system, is considered attainable through the clinical practice at the four Hospitals in Mandalay, including this Teaching Hospital (318 beds), and lectures at IMM main campus.

(2) Facilities

The requested facilities included some items that were considered inappropriate for the objectives and functions of the Project. After discussions with the Burmese side at the stage of the preliminary survey and the basic design study, alterations have been made as follows.

1) Central Diagnosis and Treatment Department

ICU (4 beds) and CCU (2 beds) will be consolidated for operational efficiency, not separated as originally requested.

2) Academic Department

At present, as practice of physical education is not included in the education program of IMM, no gymnasium needs to be included in the Project. No auditorium needs to be included in this Teaching Hospital either, since there is one on the main campus of the Institute of

Medicine, Mandalay. However, large lecture rooms for joint lectures will be provided.

3) Other Facilities

A recreation room does not comply with the objectives and functions of this Hospital and is therefore excluded from the Project. Quarters for full-time staff of the Hospital will be excluded from the Project, and will be left to the discretion of the Burmese side. However, a guest house (for 4 persons) to accommodate doctors, engineers and other persons who may visit the Hospital from outside of Mandalay and foreign countries will be provided.

(3) Equipment

No specific items of equipment were included in the Request. The equipment list provided for reference was found to be lacking in balance among the various departments and contained many items that were considered to be inappropriate in light of the local conditions.
For this reason, at the basic design stage, an equipment list drawn up in consideration of the objectives, functions, equipment administration system, operation and maintenance techniques, and operating budget of the Hospital was proposed by the Japanese side. Based on the list, and through discussions between the Burmese and Japanese sides, the most pertinent items, specifications and quantities were decided.

3-3 Outline of the Project

3-3-1 Administrative system

After the inauguration of the Mandalay Teaching Hospital, its operation and administration will be governed by the medical superintendent of the Hospital, who is to be appointed by the Department of Health.
The Mandalay Teaching Hospital personnel will consist of 411 hospital members and 74 academic members, all of whom will be placed under the control of the medical superintendent. (See Fig.3-1)

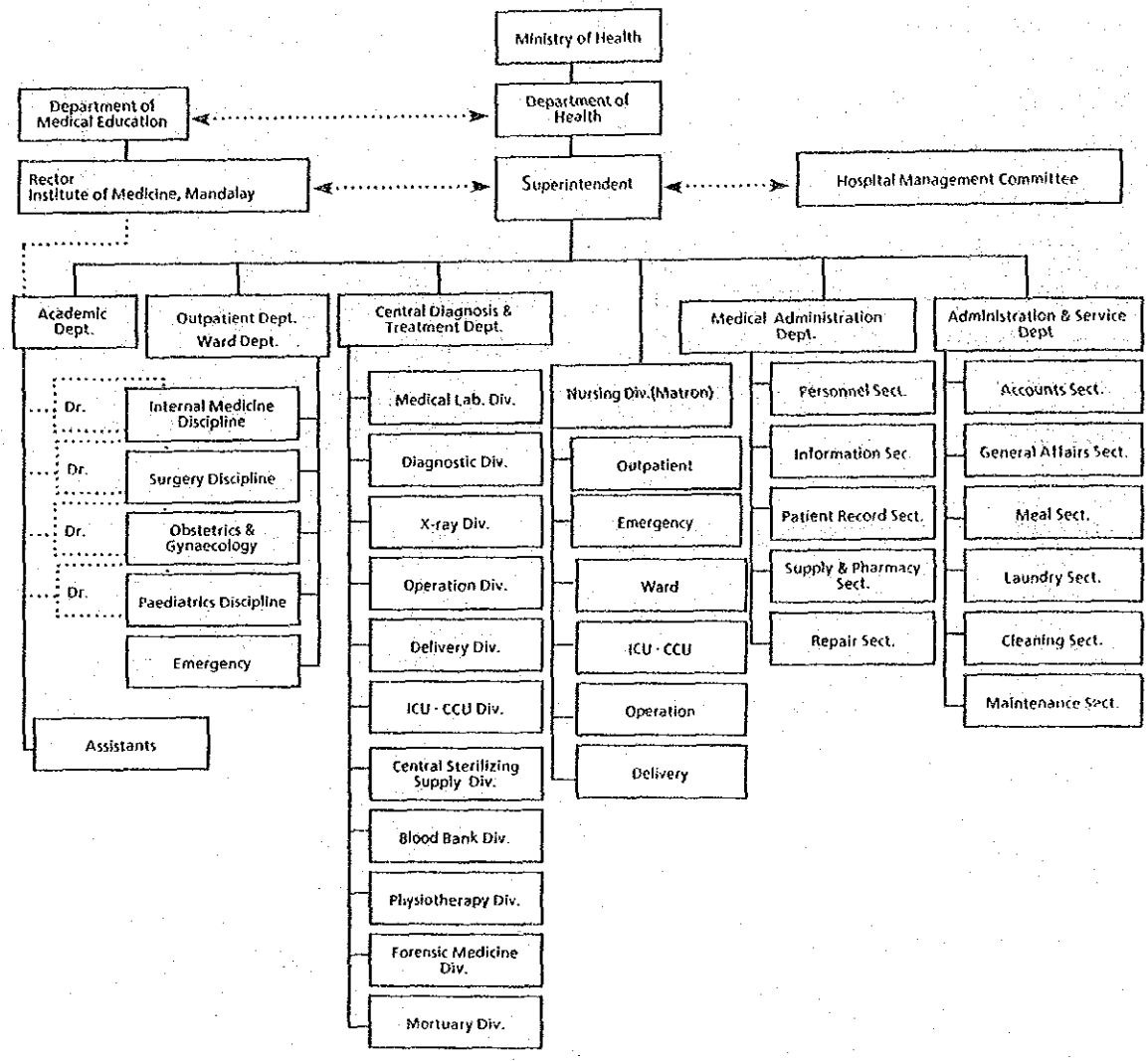


Fig.3-1 Organization chart of Administrative system

The positional breakdown of the total of 485 hospital and academic members of the Hospital according to the personnel plan is as follows.

Outpatient Department, Ward Department·····62

	Superinten-dent	Dy. super-intendent	Senior Doctor	Doctor	Pharmacist	Compounder	Officer
Administration	1	1					
Internal Medicine			2	8			2
Surgery			2	8			2
Obstetrics & Gynaecology			2	8			2
Paediatrics			2	8			2
Emergency				4			
Outpatient				2			
Dispensary					3	3	
Total	1	1	8	38	3	3	8

Central Diagnosis & Treatment Department·····73

	Senior Doctor	Doctor	Paramedical	Technician Grade I	Technician Grade II	Assistant
Medical Lab.	1	4	4	8	5	
Diagnostic	(1)	(2)	4	2	(5)	
X-ray	1	3	7	2	2	2
Operation	(2)	(8)				4
(Anesthetic)	1	4				
Delivery	(2)	(8)				
ICU·CCU		4		2		
Central Sterilizing Supply				1	2	5
Blood Bank		1				
Physiotherapy	1	1	2			
Forensic Medicine	(1)	(2)				
Autopsy & Mortuary	(1)	(2)				
Total	4	17	17	15	9	6

Nursing Division·····145

	Matron	Sister	Trained Nurse	Nurse
Nursing div.	1			
Outpatient		1	2	8
Emergency		1	2	12
(Ward) Internal Medicine		2	4	10
Surgery		2	4	10
Obstetrics & Gynaecology		2	4	10
Paediatrics		2	4	10
ICU·CCU		1	3	8
Operation		2	4	19
Paediatrics		1	2	14
Total	1	14	29	101

Medical Administration Department·····26

	Officer Rank-I	Officer Rank-II	Officer Rank-III	Officer Rank-IV	Others
Administrative Officer	(1)				
Personnel Section		(1)	3	5	2 (Typist)
Information Section		1			
Patient Record		1	1		
Supply & Pharmacy Section		1	2		3 (Pharmacist) 3 (Compounder)
Repair		1	1		2 (Assistant)
Total	(1)	4	7	5	10

Administration & Service Department·····105

	Officer Rank-I	Officer Rank-II	Officer Rank-III	Officer Rank-IV	Technician Rank-I	Technician Rank-II	Workers
	1						
Accounts Sect.		1	1	1			
General Affairs Sect.		1	1	2	4(tel. operator) 1	4(Driver)	4 7(Security)
Meal Sect.				1	1(Chief)	11(Cook)	5
Laundary Sect.		1					5
Cleaning Sect.		1	1			2(Tailor)	8(Janitor)
Maintenance Sect.							
Building		1(Engineer)	1		2 (Carpenter)		10
Mechanical		1(Engineer)	1			1	10
Electrical		1(Engineer)	1		2		10
Total	1	7	6	4	10	18	64