BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE CONSTRUCTION
OF
A NEW EMERGENCY UNIT
OF
RSUP SANGLAH, DENPASAR, BALI
IN
THE REPUBLIC OF INDONESIA

FEBRUARY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

PREFACE

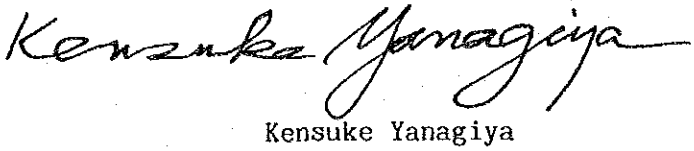
In response to the request of the Government of the Republic of Indonesia, the Government of Japan has decided to conduct a Basic Design Study on the Project for Construction of a New Emergency Unit of RSUP Sanglah, Denpasar, Bali and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Indonesia a study team headed by Dr. Nobuya Nakamura, Deputy Director, Medical Professions Division, Health Policy Bureau, Ministry of Health and Welfare, from September 13 to October 8, 1988.

The team exchanged views with the officials concerned of the Government of Indonesia and conducted a field survey in the Project area. 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 was sent to the Indonesia. 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 sincere appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the team.

February, 1989



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President

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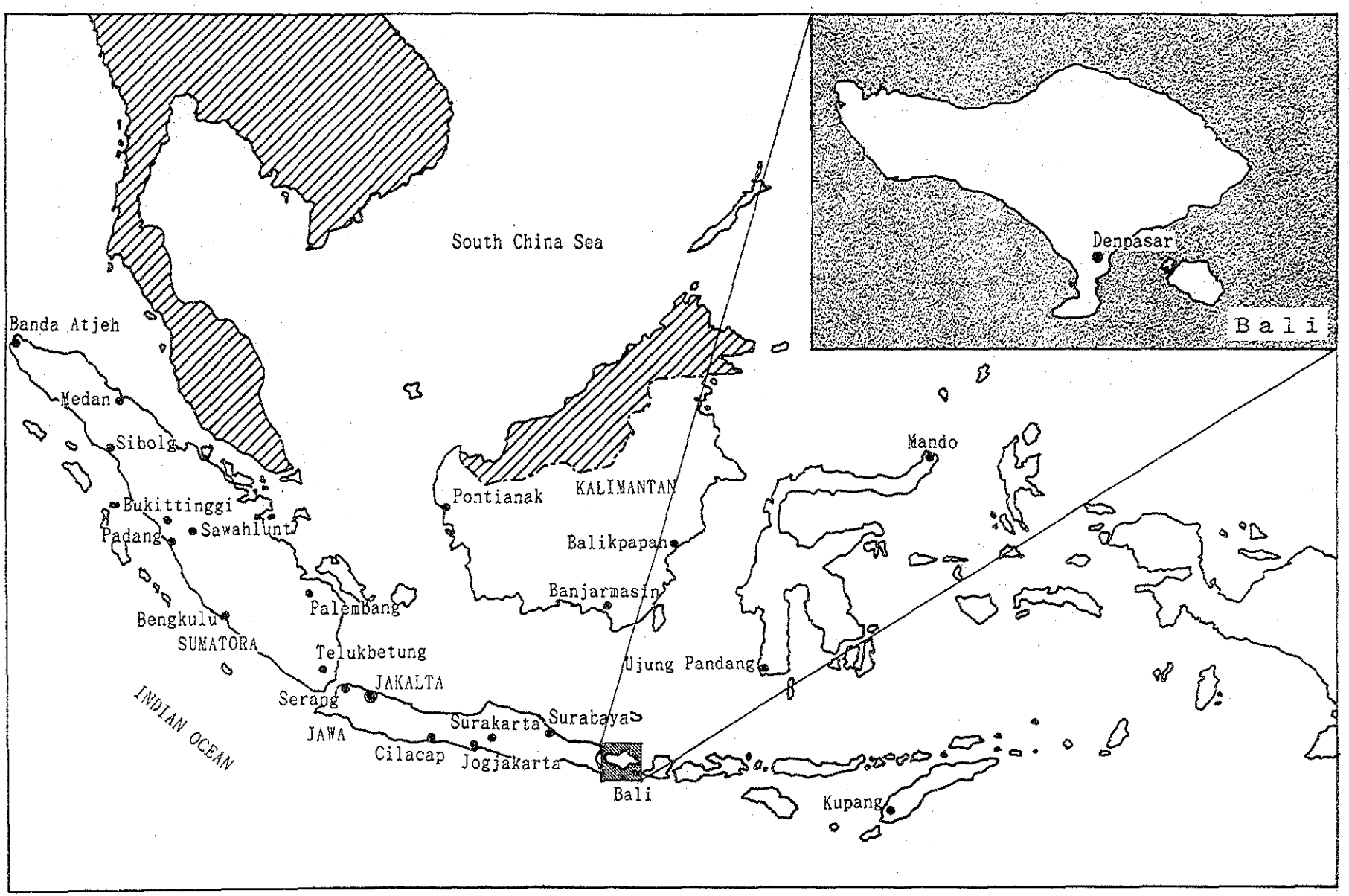

SUMMARY

Although in recent years there have been some changes in the pattern of major diseases in Indonesia, various infectious diseases, gastro-intestinal disorders, parasitic diseases and malnutrition remain major causes of death in the countryside. Many lives are being lost every year, which has placed serious constraints, on the promotion of the nation's socio-economic development. Furthermore, there has been a marked increase in the number of serious cases of traumatic injury, heat-related maladies and poisoning. These conditions which require emergency medical care, are a result of the increase in traffic accidents and workplace mishaps due to the nation's industrialization and urbanization. The increase in the number of cases of heart trouble and nervous disorders are also attributable mainly to the modernization of the people's social life and changes in their lifestyles.

Despite the fact that low income groups, which represent the greater part of the nation's total population, cannot help but utilize national and public hospitals which provide inexpensive or free medical services, these hospitals are generally not furnished with satisfactory medical equipment. In addition, there has been a basic shortage of medical doctors and nurses. In terms of quality of medical care, the nation lags far behind industrialized nations.

Additionally, few of the national and public hospitals provide medical care services for outpatients after 2:00 p.m. Therefore, those hospitals furnished with an emergency unit, which in principle operate around the clock, are forced to treat cases of simple onset sudden-onset disease, eye disease, dental disease, pediatric problems and emergency childbirth. For this reason, the role of these hospitals' emergency units is to provide medical care and services as polyclinic hospitals, rather than medical care services for serious cases of traumatic injury, heart failure and other acute or chronic diseases.

In an attempt to improve medical care, the Government of Indonesia has positioned its National Health System (NHS), launched in 1982, as the keystone to its health care policy, in order to provide the nation's people with comprehensive medical services on an equal basis. The NHS will continue to operate in keeping with each Five-Year National Plan in the future. This system represents a comprehensive development plan or a national level for health and medical care. The NHS itself is made up of three sections: Basic Policy, Long-Term Health Development Plan, and Basis Structure. The government has consistently promoted the establishment of this national health system as its top priority in the area of health and medical care since the start of the Third Five-year Na tional Development Plan (1979/80-1983/84).

Regarding health and medical care under the current Fourth Five-year National Development Plan (1984/85 - 1988/89), the Government of Indonesia is placing primary emphasis on the enhancement of the people's health conditions, on the national medical services, and on the planned parenthood project, in order to improve the above-mentioned national health system. The government has chosen "primary health care," "residents' participation" and "improvement and expansion of the referral system" as three basic goals. Regarding emergency medical care, the government aims to eliminate regional differences in quality of services provided, and to decrease the death rate in emergency cases by more efficiently meeting the residents' need for emergency medical service. The government is also planning to improve and expand the wide-area referral system through improvement of the emergency units of many medical institutions, enhanced training of medical service staffers for emergency medical service, and improvement of the emergency communication/transportation system. Additionally, it will establish a comprehensive national emergency medical service system which integrates primary, secondary, and tertiary health care services by the year 2000, as an important part of the improvement and expansion of the national referral system.

The Government of Indonesia has been making strenuous efforts to establish such a wide-area emergency medical service system on the basis of its three basic policies, namely ①"establishment of a sea link system

aimned at integrating the medical service area for the purpose of rectifying the regional differences in medical care service," ②"improvement of a top referral hospital as a medical facility to fulfill tertiary emergency medical service functions" and ③"introduction of a one-gate system aimed at efficient administering the nation's medical care personnel which are not sufficient in terms of quantity and quality." The Government's fiscal limitations and the fact that the nation has a very large land area, however, have made it very difficult for the Government to attain this very important national goal. In fact, the RSCM Emergency Medical Service Center, established in Jakarta in 1986 as a Japanese grant aid project, has just provided the basis for the establishment of a wide-area emergency medical service system for the island of Java.

The above-mentioned emergency medical service center has greatly contributed to the improvement in quality of emergency medical services provided in the Jakarta metropolitan area as well as in all the other parts of the island of Java as the nation's top referral hospital. It has been fulfilling its roles as a Class A or final referral hospital by providing emergency medical services of the highest level, by helping lower level hospitals raise the level of their emergency medical services through medical and technological research, as well as by helping in development activities related to emergency medical service.

On the basis of the above-mentioned concept of a sea link system, the Government of Indonesia has designated the South East region, which includes the provinces of Bali, South West Nusa and South East Nusa and East Timor, as an integrated medical service area (medical service zone). It has been promoting the improvement and expansion of the wide-area emergency medical service system to cover this entire area. Of the four provinces, the province of Bali is the most important. Denpasar, its capital, is now experiencing a drastic increase in population, with population density second largest after Jakarta. However, it has been found very difficult to establish a wide-area emergency medical service system in this area because of the very low levels of medical facilities, equipment, specialists and services in this area, the underdeveloped emergency transportation/communication system, the ineffective functioning

of the wide-area referral system itself, and the central government's budgetary limitations.

Under such circumstances, the Indonesian Government has recognized the importance of the establishment of a wide-area referral system and the improvement of the level of medical services provided by lower level hospitals in this area. Both of these items will be indispensable in improving the emergency medical service in this area, formulated a project for improving and expanding the existing emergency unit of Sanglah Hospital in Denpasar on Bali Island, and requested grant aid for this project from the Japanese Government. This hospital is providing medical services on the largest scale and of the highest quality in the area and is therefore expected to operate as functionally equivalent to a Class A hospital, even though it is classified as a Class B2 hospital (a Class B hospital which ranks second after a Class A hospital in the classification of the nation's public hospitals and which functions also as an educational hospital).

In response to the request by the Indonesian Government, the Japan International Cooperation Agency, dispatched a basic design study team to Indonesia from September 13 to October 8, 1988 to examine the propriety of the proposed project and conduct on-the-spot surveys necessary in drafting an appropriate basic design. JICA dispatched another study team to Indonesia from February 12 to 21, 1989 to explain the draft basic design study report prepared based on the findings of the above-mentioned studies to the Indonesian side and have consultations with the Indonesian side for confirmation of the details.

As a result of the above-mentioned surveys, the study team concluded that it was imperative to build a network for the wide-area emergency referral system in the area (the Tengarra region) in order to promote the establishment of a wide-area emergency medical service system on a nationwide scale as envisaged by the Indonesian Government, as well as to raise the level of emergency medical service currently provided in the area. To this end, it would be necessary, they concluded, for Sanglah Hospital to function as a top referral furnished with the medical care

equipment required of a medical facility to provide tertiary emergency medical care services which will meet varied medical needs of the area and play a central role in emergency medical care there.

Therefore, this project is aimed at positioning the new emergency medical care center to be constructed as a part of Sanglah Hospital. This center will improve and expand the existing emergency unit of the hospital, making it possible to provide emergency medical care services in the area by establishing a network of wide-area emergency referral system centered around the emergency medical center itself. In doing so, it will improve the National Health System by raising the level of the lower level medical facilities and their staffers through education and training programs implemented by the center.

The outline of this project is as shown below.

Activities of the projected emergency medical center:

1) Emergency medical care service activities

(i) Emergency medical examination and treatment of emergency referral patients from low-income groups in the area (departments: internal medicine, surgery, obstetrics, gynecology and pediatrics). Also, to provide other emergency medical care service activities as the area's tertiary emergency medical center.

(ii) To engage in efficient early emergency medical care activities in places outside the center by means of mobile ICUs dispatched from the center and used to referral patients to the center.

2) Educational and training activities

(i) To educate and train medical specialists (doctors, nurses, and paramedical staff) of the lower level medical facilities in the area (the Tengarra region) in emergency medical care.

(ii) To conduct guidance tours of remote medical facilities such as public health centers and sub-centers for the purpose of

spreading techniques and knowledge of emergency medical care, and providing local residents with medical care services and educational services on health and hygiene.

Organization in charge of this project:

The Ministry of Health Medical Affairs Bureau

Project site: A part (approx. 6,000 m^2) of the premises of Sanglah Hospital, Denpasar, Province of Bali

Total floor area: 3,725 m^2

Structure of building: 2-storied reinforced concrete building

Facilities: Emergency first medical examination, intensive care, surgery, central medical supplies, emergency obstetric and gynecology, administration, services, and common facilities for each field.

Required equipment: Emergency medical examination/treatment equipment, emergency medical care, and educational equipment

When this project is to be implemented under a Japanese grant aid, the cost to be borne by the Indonesian side to approximately ¥20 million. As regards the cost to be borne by the Indonesian side, it has been revealed as a result of the above-mentioned studies that the amount has already been secured as an increase in Sanglah Hopspital's ordinary budget.. It is understood that it will take about 12 months after procedures like tender are concluded and after the signing of the Exchange of Notes (E/N) to complete the construction of this center's facilities.

The implementation of this project will greatly contribute to the establishment of a wide-area emergency referral system in accordance with the Indonesian Government's health and medical care policies, which are aimed at improving and expanding the nation's health and hygiene programs as well as providing the people with quality emergency medical care services, and thereby, reducing the death rate in emergency cases, improving the level of lower emergency medical care facilities and their staffers, and making an invaluable contribution to the training of medical specialists for emergency medical care. Furthermore, the establishment of

this center will contribute to the development and promotion of the tourist industry in the area, which will help the local economy develop. At the same time, it will bring indirect economic benefits to the area through improvements made in measures to cope with natural disasters such as the volcanic activity on Bali Island and air traffic accidents which are increasing in line with the recent marked increase in demand for air transportation.

Sanglah Hospital, to which this center is to be annexed, is under the direct control of the Ministry of Health. The budgetary and personnel provisions for this project can therefore be made within the ministry when this project is implemented It has also been decided that the budget and personnel placement for the actual operation, maintenance and management of this center should be carried out within the total organizational framework of the hospital, not within the center alone.

In general, this emergency medical care center will consist of hardware, which includes facilities and equipment, and software, which includes human resources. Hardware and software are equally important. The planned Japanese assistance in this project is only in the area of hardware. The Indonesian side will be totally responsible for the software necessary for the project. Unfortunately, however, in light of the present status of medical care in Indonesia and the severe budgetary constraints facing the Indonesian Government, it is likely that the Indonesian Government will find it very difficult to secure the necessary software on its own. If, at the request of the Indonesian Government, the Japanese side takes a positive stand for technical cooperation in the area of software, such as dispatching experts to Indonesia and accepting trainees such as Indonesian medical doctors, nurses, technicians and managers, it will certainly enhance the effectiveness of the planned Japanese grant aid.

CONTENTS

CHAPTER 1 INTRODUCTION

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Since 1969, the Government of Indonesia has been consistently implementing Five-year National Development Plans. In the area of health and medical care, the National Health System (NHS), which was established in 1982, has been positioned as the cornerstone of the Government's national medical care policy since the latter half of the 3rd Five-year National Development Plan (1979/80 to 1983/84). Its basic principles have been incorporated in the current 4th Five-year National Development Plan.

The above-mentioned NHS is also positioned as a sub-system operating close agreement with the Five-year National Development Plans. It can be defined as a comprehensive health development plan on a national level and consists of the following three components.

(1) The "Basic Policy for NHS" in which the medium to long term direction and basic concept of the nation's health development is defined.

(2) The "Long Term Health Development Plan" in which the concrete goals to be attained and policy measures to be taken by the year 2000 are defined.

(3) The "Basic Structure" in which all the components and the framework of NHS that are to be operated properly, effectively and efficiently on the basis of the "Basic Policy" are defined.

In the current, the 4th, Five-year National Development Plan, with a view towards enhancing the level of health and towards improving the national medical care services the Government chose "primary health care", "community residents' participation" and "improvement and expansion of the referral system" as three basic goals for improving the NHS.

Of these basic goals, the "improvement and expansion of the referral system" is indispensable for establishing the nation's emergency medical care system and improving the emergency medical services under the system. It's clear, therefore, that efforts to improve and expand the basis for the nation's emergency medical care is given top priority in the

Indonesian Government's health development policies.

As concrete measures to improve and expand the referral system, the Government of Indonesia intends to improve and expand the wide-area referral system through improvements in the quality of emergency medical care and the emergency communication/transportation system, and training emergency medi cal care personnel. It also seeks to establish a nation-wide emergency medical care system in which the primary, secondary and tertiary medical services are integrated by the year 2000, with the aim of eliminating regional differences in the quality of emergency medical care services and realizing a decrease in the death rate in emergency bases.

Under these circumstances, the Government of Indonesia requested that the Government of Japan provide a grant-in-aid for the project to improve and expand the emergency unit of the Sanglah Hospital in Bali. The two main points of the Indonesian request were the construction of a new emergency medical care center including provision of its medical equipment, and the improvement and expansion of the emergency communication and transportation system which includes Mobile Unit emergency communication network.

The primary rationale which the Government of Indonesia was aware of at the time they formulated the project plan was probably the need for improvement of the nation's emergency medical care system But the concrete reason for this project the Government of Indonesia mentioned in its formal request to the Government of Japan was the existing emergency medical care facilities' inability to cope with the sharp increase in Bali's population and the increase of the number of traffic accidents and tourists injured. The proposed construction of a new emergency medical care center will not only improve the quality of emergency medical care services, it will also help the hospital establish itself as the top referral hospital in all of the Tengarra region, which includes West and East Nusa Tenggara and East Timor as well as the province of Bali.

In response to this request from the Indonesian Government, the Japanese Government decided to dispatch a study team to Indonesia to

examine the background of the project, to better understand the reason why the Indonesian Government chose a hospital in Bali (this is the second in a series of projects to improve the nation's key hospitals, the first hospital being located in Jakarta), to examine the propriety of the project and the optimal scale of the center's building, and then to prepare basic design drawings, calculate the costs of the project and evaluate the Indonesian side's ability to manage the project.

On the decision of the Japanese Government, the Japan International Cooperation Agency dispatched a basic design study team headed by D. Nobuya Nakamura, Deputy Director, Medical Professions Div., Health Policy Bureau, Ministry of Health and Welfare to Indonesia from September 13 through October 8, 1988. During their staying in Indonesia, the members of the study team consulted the officials at the Ministry of Health of Indonesia. They also visited the RSCM emergency medical care center and other emergency medical facilities in Jakarta, collected necessary data and information, confirmed the contents of the request made by the Indonesian side, examined the contents of the request in Japan, and prepared a draft report on the basis of the results of these activties.

Additionally, the study team visited Indonesia during the period February 12 through 21, 1989 to explain the above-mentioned draft report to the Indonesian side. After consultation and confirmation with the Indonesian side they prepared this report.

The list of members of the basic design study team, the study team's itinerary, the minutes of discussions and other data are attached to this report.

CHAPTER 2 BACKGROUND OF THE PROJECT

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2-1 Outline of the Republic of Indonesia

The Republic of Indonesia covers an area ranging, in latitude, from Lat. 6°N to Lat. 11°S. and, in longitude, from Long. 95°E to Long. 141°E. The country consists of approximately 13,700 large and small islands, including the islands of Sumatra, Java, Sulawesi and Kalimantan. Of its total land area of approximately 192 million kilometers, which is about 5.5 times as large as that of Japan, 60 percent is woodlands. Indonesia is the country with the world's largest tropical forests.

Being situated near the equator, the country has a tropical climate, with no significant seasonal changes. In this country, a year is divided into the dry season which lasts from April to September and the rainy season which lasts from October to March. The country's average annual rainfall is approximately 700 mm. It rains heavily during the rainy season. The air temperature is almost constant, about 27°C throughout the year.

The country has a population of approximately 164 million (estimated value for 1985 calculated on the basis of the results of the 1980 Census) the fifth largest population in the world. Of this total, approximately 120 million, or 74 percent, live in rural areas. Still, the country's population is distributed quite unevenly. Nearly 61 percent of the country's total population live on Java, which accounts for only 6.9 percent of the total land area. Consequently, Java's population density is 755 persons/km^2, which is far larger than the national average of 169 persons/km^2. By contrast, Kalimantan has a population density of 15 persons/km^2, and Irian Jaya 3 persons/km^2.

It should also be noted that the Nusa Tenggara region, which includes Bali, has a population density of 106 persons/km^2, which is the second highest in the country after Java.

Table 1 Area of principal regions and distribution of population

Regions	Area		Population (estimated in 1985)		Population density/km² (person)
	km²	Component ratio(%)	(1,000 persons)	Component ratio(%)	
Sumatra	473,606	24.7	32,603	19.9	69
Java	132,187	6.9	99,852	60.9	755
Nusa Tenggara	88,488	4.6	9,336	5.7	100
Kalimanta	539,460	28.1	7,722	4.7	14
Sulawesi	189,216	9.8	11,554	7.0	61
Irian Jaya	496,486	25.9	2,980	1.8	6
Total	1,919,433	100.0	164,047	100.0	169 (average)

Source: Central Bureau of Statistics (CBS)

Note: Population is estimated by CBS on the basis of the 1980 Census conducted in October.

Between 1961 and 1970, the country's average annual population growth rate was 2.1 percent, and from 1971 to 1980 it increased to 2.3 percent. From 1980 to 1985 it decreased to 2.2 percent. However, the country's average annual population growth rate is still high.

Table 2 Population changes(1961-1985)

Years	Population (thousand)	Population growth rates(%)
1961	97,085	> 2.10 %
1971	119,206	> 2.32 %
1980	147,490	> 2.15 %
1985	165,150	

According to the interim results of the 1985 Census, 54.7 percent of the total number of jobholders were engaged in agriculture. The agricultural sector's share of the nation's total labor force was on the decline, compared with its 64.2 percent share of the total in 1981. But the scale

of this sector is still on the increase. The fact means that villages still support the bulk of the nation's huge population.

It is said that the population of the rural areas of Java Island, where about 60 percent of the nation's total population reside, has already reached a saturation point. Recent modernization and labor saving advances in agricultural production are reducing employment opportunities in rural areas.

For this reason, the surplus population in rural areas is moving to urban areas. This, in turn, is bringing about population explosions in the cities. The rapid increase in urban population has become a serious social problem not only in such densely populated areas as on Java but also in Medan and Padan on Sumatra, Ujonpaudan on Sulawesi and Denpasar on Bali.

In an effort to correct this extremely uneven distribution of the nation's population and prevent further influx of rural population into urban areas, the Government of Indonesia is actively promoting the "transmigration" policy. Thus far however this effort by the central government has not proved very successful.

From 1962, when the Indonesian Government started a full-scale economic development effort under the Five-year National Development Plan, until 1981, the Indonesian economy grew at an average annual rate of 7.9 percent. Since 1981, however, there has been a slowdown in the country's economic growth, due mainly to the decline in its oil exports. In 1982, the country was confronted with a balance of payments/public finance crisis.

For this reason, the Indonesian Government has adopted drastic economic reconstruction policies.

The current 4th Five-year National Development Plan is also based on these policies. The goal for the nation's economic growth under the current national development plan is rather conservative, compared with those set under the previous national development plans.

The period of the 4th National Development Plan is defined as a period during which the basic framework for Indonesia's self-supported economic growth is created. The 5th National Development Plan is intended to reinforce the framework created during the 4th plan period. The 6th

National Development Plan is designed to lay the groundwork for building an affluent and fair society on the basis of the Government's policy "unity in the midst of diversity." The Government of Indonesia is determined to step up its health development efforts on the basis of the three basic concepts of fairness, growth and stability. As regards the "fairness" in particular, the Government intends to continue making strenuous efforts to attain the following eight goals.

a. Securing sufficient food, clothing and shelter for the general public.

b. Equal opportunities in the areas of education and medical care.

c. Fair distribution of income.

d. Equal employment opportunities.

e. Equal opportunities in economic activities.

f. Equal opportunities in community residents' participation.

g. Elimination of regional differences.

h. Equal distribution of fair development opportunities.

The specific area of health and medical care will be discussed in below 2-3, "the Present condition of Medical Care in Indonesia". NHS was instituted in 1982 as a system for enabling the people to receive, on an equal opportunity basis, comprehensive medical care services. It has been consistently operating as the cornerstone of the nation's medical care policy measures since the start of the 3rd Five-year National Development Plan.

2-2 Outline of Bali (the Province of Bali)

Bali, which is situated adjacent to the east side of Java, is the main island of the Province of Bali. It includes Penida Island and other small islands, as well as Denpasar, the capital of the province. The island and the islands of Lombok, Sumbawa, Sumba, Flores and Timor constitute the Nusa Tenggara Islands. It faces the Indian Ocean on the South and the Java Sea on the North. On its West side it is separated from Java by the Bali Straits, and on it's East side it is separated from Lombok Island by the Lombok Straits. Since the Walles line, which divides the region into Asia and Australia in terms of biota, passes through the straits, Bali is considered to be located at the Southeastern end of Asia, both geographically and bionomically.

The Southwestern side of the island is approximately 145km long. The distance from this side to the Northern side of the island is 80km. The island has a total land area of approximately 5,560 km^2, about twice as large as that of Tokyo or about one-fourth the size of Shikoku. Of the island's total land area, 22.1 percent is woodlands, 17.2 percent paddy fields, 10.6 percent fields, 31.5 harbors, and 12.5 percent residential areas.

The Republic of Indonesia, which belongs to the Pacific Rim group of countries, has a total of 78 active volcanoes. The Northern part of Bali belongs to a volcanic zone extending from the Eastern part of Java. In the center of Bali is Mount Batooka (2,276 meters) and at its Eastern end is Mount Agun (3,142 meters), both of which are active volcanoes. In 1963, Mount Agun erupted, claiming about 3,500 lives and injuring more than 35,000 people. The Southern slope of the island's mountainous area, which includes these volcanoes, is a gently sloping fertile plain. Many rivers run Southward through this plain into the sea.

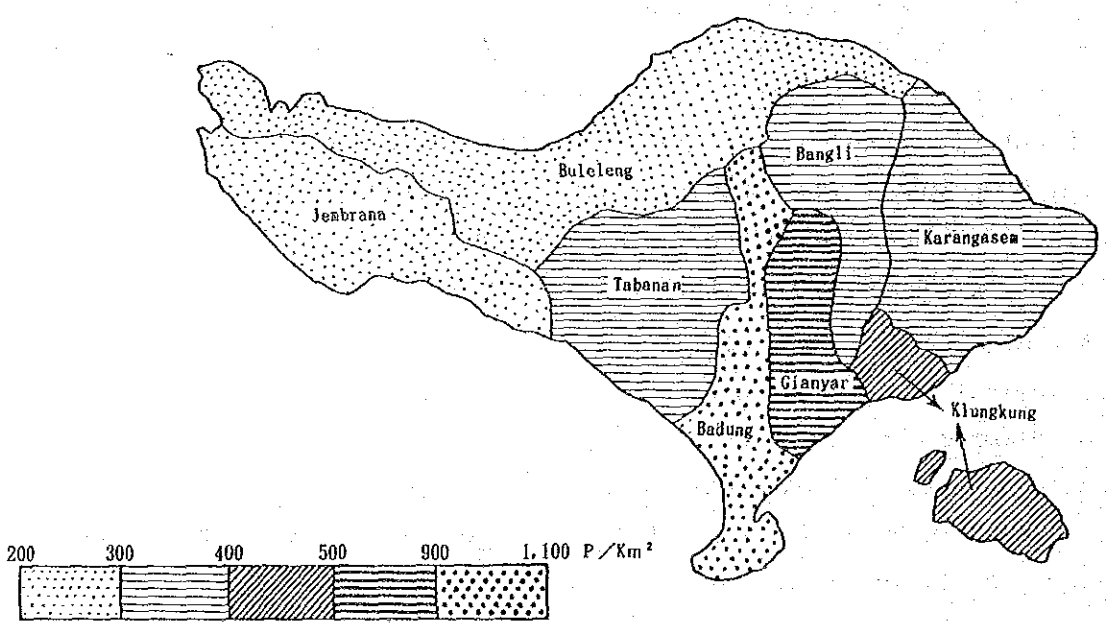
Although the island's climate is basically tropical, its central area has a tropical rain forest climate, its peripheral areas a tropical monsoon climate, and the area along its northern shore a savanna climate, reflecting the above-mentioned geographical features of the island. On Bali, a year can be divided into the dry season, which lasts from April to November, and the rainy season which lasts from November to March. Due to

the effects of the monsoon, however, the time either the dry or the rainy season begins varies from year to year.

The island's annual average air temperature ranges from 25°C to 30°C. In the hilly areas of the island, however, the daily average air temperature sometimes falls below 10°C. The annual average rainfall is 1,200mm near the Northern coast and about 2,000mm near the Southern coast. The average relative humidity is about 80 percent during the rainy season and about 65 percent during the dry season. The velocity of the monsoon is not so high. The island is rarely hit by a typhoon.

In 1987, Bali had a population of approximately 2.62 million, an increase of 0.69 percent over the previous year. The island's average population density is 465 persons/km^2, which is the second highest population density island following after the 755 persons/km^2 of Java Island. The geographical distribution of the island's population density is as shown in the figure below. Noteworthy is the fact that the Badung district where Denpasar, the capital of the province, located is, and the Gianyar district are both very densely populated. The population density of the two districts is 1,037 persons/km^2 and 867 persons/km^2 respectively. This fact is evidence of the progress of urbanization in these districts.

Fig.- 1 Population Density of Bali



On Bali, which is blessed with fertile soil and abundant rainfall, agriculture has traditionally been the major industry. In recent years, however, the tourist industry has been growing so fast that it now ranks second after agriculture in terms of both ratio of output to the province's total output and percentage contribution. Underlying this fact are the Indonesian Government's tourism promotion policy measures aimed at gaining foreign currency. The Government has been actively promoting the nation's tourist industry, including the relaxation of government control on the issuance of visas to foreign tourists, the improvement and expansion of tourist facilities, and the increase in the nation's air transport industry's service capabilities.

Since Bali is the largest tourist spot in Indonesia, and since most of the income from tourism on the island constitutes net profit (which means it has a positive effect on employment opportunities on the island), it is expected that the island's tourist industry will continue to grow fast, as an important industrial replacement for agriculture.

The number of foreign tourists visiting Bali has been increasing from year to year. In light of this fact, the Government of Indonesia has been placing high priority on the improvement and expansion of the island's tourist industry, including increasing the number of air routes and flights to the island, improving and expanding the Nugura Rai (Denpasar) Airport, the hotels, pensions and other tourist facilities on the island. All this will contribute to further increases in the number of foreign tourists visiting the island.

Table 3 Changes in total production in the Bali province

(1983 price - billion RP)

	1983		1984		1985		1986	
	Amounts of production	(rates of contribution)	Amounts of production	(rates of contribution	Amounts of production	(rates of contribution	Amounts of production	(rates of contribution
Agriculture	390.27	43.31	427.11	43.22	430.46	40.13	456.46	39.60
Building stone	5.91	0.66	4.50	0.46	4.23	0.39	3.63	0.31
Manufacture	38.99	4.33	41.87	4.24	48.94	4.56	57.39	4.98
Power, water supply	6.75	0.75	7.84	0.73	10.16	0.95	11.22	0.97
Construction	61.71	6.85	62.37	6.31	64.20	5.98	63.44	5.50
Hotel, restaurant Commerce	129.91	14.08	143.32	14.90	167.43	15.61	185.00	16.05
Transportation, communication	83.72	9.29	93.40	9.45	101.33	9.45	111.48	9.67
Finance	18.96	2.10	21.55	2.18	21.99	2.05	24.20	2.10
Housing	7.90	0.88	8.84	0.89	8.99	0.84	9.13	0.79
Government, public agencies, national defense	77.86	8.64	78.45	7.94	96.55	9.00	98.84	8.52
Services	82.22	9.12	95.53	9.67	118.45	11.04	132.63	11.50
Total	901.09	(100)	988.18	(100)	1,072.78	(100)	1,157.81	(100)

Table 4 Immigrants by month (1983-1987)

	1983	1984	1985	1986	1987
Jan.	12,024	17,062	14,897	19,378	22,870
Feb.	11,192	14,038	16,899	18,738	21,652
Mar.	12,906	17,546	19,813	21,414	25,511
Apr.	11,916	15,588	14,462	16,915	23,206
May	13,184	13,655	16,678	18,199	22,379
June	10,923	12,384	15,999	18,129	24,382
July	14,860	15,975	16,931	18,989	26,811
Aug.	18,800	20,310	22,027	27,251	30,485
Sep.	15,203	15,309	19,289	20,141	25,912
Oct.	16,685	14,755	17,772	20,222	28,707
Nov.	14,003	15,704	16,209	21,506	28,643
Dec.	14,879	16,497	20,246	22,199	28,734
Total	166,575	188,833	211,232	243,345	309,292

Source: The Immigration Bureau of the Bali Province

Table 5 Immigrants by country (1985-1987)

Nationalities	1985	1986	1987
(Asia and Oceania)	(139,444)	(152,276)	(146,342)
Australia	86,132	86,317	101,918
Hong Kong	1	6	5
India	196	303	462
Japan	48,217	58,965	34,235
Korea	719	1,015	1,695
New Zealand	3,994	4,309	5,227
Taiwan	143	268	2,654
Pakistan, Bangladesh, Sri Lanka	42	83	148
(Europe)	(45,420)	(58,024)	(113,670)
Denmark	349	733	1,464
France	3,090	4,007	1,464
West Germany	4,326	5,496	17,735
Italy	6,512	8,642	16,764
Austria	642	1,409	4,253
Switzerland	3,462	4,403	6,347
United Kingdom	22,451	26,621	41,562
	1,861	2,551	6,778
Norway, Sweden, Finland	1,557	2,744	5,543
Spain, Portugal	1,131	1,418	2,659
Other European countries	40		1

Source: The Tourist Bureau of the Bali Province

2-3 Present Medical Care Situation in Indonesia

2-3-1 General Conditions of Medical Care

(1) General Conditions

The Government of Indonesia has thus far implemented a total of 4 five-year national development plans, including the current 4th Five-year National Development Plan. These national development plans have brought about many outstanding achievements in the area of health and medical care. However, the results of the Government's efforts along this line, including the improvement in the level of medical facilities and personnel and improvement of the nation's medical care system itself, have been far from attained its initial goals. In light of the nation's huge population (which is expected to reach the 180 million mark in 1990), the rate of population growth (which has thus far averaged approximately 2 percent), and the present conditions and future prospects of the nation's rapid industrialization, the Government is fully aware of the need to step up its efforts to meet the general public's demand for better health and medical care, which is expected to both increase and grow more and more complicated.

In the above-mentioned 4th National Development Plan, as was also mentioned earlier, the increase in the people's health levels and the improvement of the national medical care service, along with the planned parenthood project, constitute the core of the Government's top priority policy measures in the area of health and medical care. The Government intends to attain the following 5 basic goals through the NHS (which should be considered to be serving as a the NHS-the framework of the Government's policy guideline- on health and medical care):

o Basic Goals of NHS

i. Creating willingness among to people to maintain good health on their own.

ii. Improvement, both qualitative and quantitative, in the quality of services provided by medical specialists.

iii. Steady supply of drugs and foods and surveillance of hazardous substances.

iv. Improvement in nutritional and hygienic standards.

v. Establishment and enforcement of laws and regulations related to health and medical care.

The level of health and medical care in Indonesia can be measured by means of such health and medical care indicators for the country as the disease incidence rate, the death rate and the average life span. Table 6 shows the outline of these indicators.

Table 6 Indicators of health and sanitary conditions

Items	Indicators and changes	Remarks
1. Rates of affected persons	4.9% 1972 11.4% 1980	Of all affected persons, infections diseases are about 60%.
2. Death rates (Per 1,000 persons)	18.7 persons 1961-1971 12.5 persons 1971-1980	Comparison of death rates by region: Java 16.0 Sumatra 18.9 Kalimantan 19.3 Sulawesi 20.4 Others 22.0 Death rates are high in less than 5 age and old age.
3. Birth rates (Per 1,000 persons)	39.1 persons 1961-1971 35.9 persons 1971-1980	
4. Death rates of infants (Per 1,000 newborns)	137 persons 1961-1971 110 persons 1976 100 persons 1980 70 persons 1985	Death rates 50% in neonatal period. Target value in 2000: 50 persons Comparison with other countries (1985): Japan 5 persons The Philippines 45 persons
5. Death rates of pregnant women (Per 100 thousand births in hospitals)	40 persons 1980	30 to 70 percent of pregnant women suffer from anemia owing to the lack of nourishment, and 7 percent from the lack of calories and protein. Target value in 2000: 20 persons
6. Average life span (national average)	Male Female 1971 45 age 48 age 1976-1981 46.5 49.4 1981-1985 48.9 51.9	Target value in 2000: 60 age

Source: The Ministry of Health
(A survey was made on 111,686 persons in 1972 and 121,129 persons in 1980.)

There are wide regional differences in the nation's population distribution. It is essential to promote policy measures aimed at such social improvement as education on public health and to spread of information on this subject in order to improve medical care services for a society with varied educational traditions, manners and customs.

It should also be noted that the low level of existing medical facilities and the serious shortages of medical specialists are two of the factors preventing the improvement of medical care services in Indonesia. Table 9 shows a comparison of the present condition of medical care services in Indonesia and Japan.

Table 7 Present conditions of medical institutions and duty staff, and its comparison (1983/1984)

	Indonesia	Japan
Physician	17,647	167,952
(Per 100 thousand persons)	11	149
Dentist*	2,700	58,362
Hospital	1,266	9,515
Public hospital	619	1,949
Private hospital	647	7,566
Hospital bed	100,000 beds	1,730,000 beds
Pharmacist	3,300	124,390
Pharmacy	1,717	33,287

Source: The 1982 statistics

(2) Changes in the Pattern of Major Diseases

In the past, infectious diseases peculiar to developing countries were prevalent in Indonesia. In recent years, however, there has been a marked increase in the ratio of the number of non-infectious disease to the total number of diseases. This means that the pattern of major disease in the country is becoming more similar to that of industrialized countries.

Although there are some differences in the pattern of major diseases between urban and rural areas, the pattern for the country as a whole is characterized by a predominance of infectious diseases of the respiratory

organs, followed by diseases of the skin, local infectious diseases, diseases of digestive organs, heart disease, rheumatism, arthritis and eye diseases in that order. Of the total number of diseases recorded in 1980 (disease incidence rate: 11.4%), approximately 57 percent were infectious diseases.

In recent years, however, there has been a remarkable increase in the number of traumatic injuries caused by traffic and industrial accidents in urban areas on the one hand, and in the number of poisonings caused by toxic substances including agricultural chemicals in rural areas on the other.

As the people enjoy better nutrition and the level of public health is raised so that city dwellers lifestyles become more and more modernized, infectious diseases of the respiratory organs such as pneumonia and bronchitis, diarrhea and the like, will be replaced by heart diseases, injuries caused by accidents, diabetes, diseases of the circulatory system, cancers, mental and nervous disorders as the major causes of death in the country. Local medical facilities' and their medical specialists' attention will become focused on the treatment of the latter group.

(3) Current State of Medical Care Services

Medical care services for the general public of the country are provided mainly by hospitals, medical offices, health centers and sub-centers. Hospitals are divided into public and private hospitals. There are a very limited number of private hospitals funded by religious or other organizations in big cities like Jakarta. The medical care services in Indonesia are heavily dependent on national and public medical institutions.

Public hospitals are divided into 1) public hospitals under the direct control of the Ministry of Health and those under the direct control of the Ministry of Home Affairs, 2) hospitals of the army, navy and air force, and 3) public hospitals founded by ministries other than the Ministry of Health, such as the Ministry of Transportation, the Ministry of Posts and Telecommunications and the Ministry of Agriculture. National and public hospitals are ranked hierarchically -- from Class A down to Class D -- according to types of services provided, scale and functions.

Table 8 shows the classification of public hospitals.

Table 8 Classification of public hospitals

Types	No. of beds	Functions and ranking	Places(1980-1988)
Class A hospital	1,000	Advanced medical center - teaching hospital	2
Class B1 hospital	600-700	Advanced medical non teaching hospital	11
Class B2 hospital	600-700	Advanced medical teaching hospital	3
Class C hospital	less than 200	Regional hospital	43
Class D hospital	more than 50	Regional sub-hospital	221

Health centers are called "puskesmas" in Indonesia. A sub-center or sub-centers are usually attached to a health center. They provide medical care services to low income groups in both rural and urban areas. The Government of Indonesia is committed to the improvement and expansion of these medical facilities. In 1980, there were 2,676 health centers and 8,342 sub-centers in Indonesia. In 1983/84, the total number of health centers increased to 5,353 and that of sub-centers to 13,636. It is expected that the total number of health center will increase to 5,835, sub-centers to 19,636 by 1988/89, the last year of the current 4th National Development Plan. If these goals are attained, there will be a health center for every 30,000 persons and a sub-center for every 8,000 persons, which will mean a full-scale nationwide network of medical care services will be in place.

On the other hand, rural areas of the country are generally not equipped with sufficient transport facilities. There are many remote islands. This means that the area covered by a health center is very limited. In light of this fact, the central government is utilizing 1,300 Mobile Units and 190 floating medical examination facilities (both figures are for 1980) to provide medical care services in remote places.

At least one general practitioner (GP) is stationed at a health center. The GP's main activities include 1) treatment, 2) health care for mothers and children, 3) prevention of infectious diseases, 4) environmental hygiene, 5) education on hygiene, 6) public health and nursing, 7) recording and reporting, 8) nutritional improvement, 9) health in schools, 10) dental hygiene, 11) mental health and 12) testing.

(4) Referral System

The Government of Indonesia is making strenuous efforts to improve and expand the nation's referral system so that the general public may enjoy comprehensive medical care services on an equal basis. This is to be achieved through the efficient and effective use of medical facilities.

Under the referral system, a patient first visits a nearby health center or sub-center to receive diagnosis and/or treatment. Depending on the seriousness of his or her disease or injury, the patient is then referred to a Class D, Class C, Class B or Class A hospital.

At present, however, this system is not functioning satisfactorily for the following reasons.

① Neither Class C hospitals nor Class D hospitals are furnished with facilities or equipment necessary.

② Sufficient training of medical specialists is lacking due to the shortage of institutions of higher education.

③ Full-fledged patient transportation and wide-area communications systems are lacking.

The central government intends, therefore, to continue emphasizing the referral system as the core of its medical care policy, along with primary health care and community residents' participation in the 5th National Plan.

(5) Medical Care Personnel

While the number of medical specialists, including paramedical staff, has been increasing from year to year, there is still a basic shortage of medical doctors. In 1984, the total number of medical doctors was approximately 7,600, one medical doctor for every 100,000 citizens, compared with 149 in Japan, 190 in the U.S., 150 in Britain, and 230 in France. It is imperative, therefore, to increase the total number of medical doctors to effectively carry out the nation's medical care policy measures.

For this reason, the Indonesian Government intends to drastically increase the number of medical specialists by 1988/89, the last year of the current 4th Five-year National Development Plan. The quantitative goals set for this purpose are shown in the table below.

Table 9 Plans for increasing medical duty staff

Unit: person

	Results of the third plan (1983/1984)	Target values for the forth plan (1988/1989)
1. Specialist	2,733	3,424
2. General practitioner	7,529	13,614
3. Dentist	1,292	1,773
4. Medical student (completed the 6-year course)	1,219	5,283
5. Social medical center staff	44,651	76,238
6. Medical technician	12,001	38,461
7. Medical assistant	29,433	50,461
8. Clerk	63,241	94,643
Total	162,129	283,897

Note: Nurses and laboratory technicians are included in 6, 7.

Source: Statistical data of Ministry of Health

Every year nearly 1,000 medical doctors and 500 pharmacists graduate from 14 national universities and 13 private universities. This does not, however, meet the nation's demand for these medical specialists. Medical students who have just completed the 6-year course at medical schools of these universities are required to spend 2 to 3 years in the rural regions of Sumatra and Kalimantan, providing medical care services there. After that, they are licensed to practice medicine as general practitioners (GPs). They have to receive in-service training at universities or educational hospitals for 3 to 8 years and then pass the official examination before they are licensed to be specialists (SPs). Many able medical students have to abandon their plan to become GPs or Sps for financial reasons.

There are about 230 nurses' schools and colleges in Indonesia. Nurses' schools (SPKs) give graduates from junior high schools 3-year training in nursing, while nurses' colleges (akademis) train graduates from senior high schools for 3 years. Every year some 6,000 nurses graduate from these nurse training institutions. But there is still a basic shortage of nurses.

Indonesia's health and medical care policies, as can be seen from the above-mentioned basic goals of the NHS, are therefore aimed at preventing infectious diseases in provincial areas by means of primary health care, by spreading basic knowledge of health and medical care, and by promoting residents' participation in community health and hygiene activities.

To promote the smooth implementation of these policy measures, however, it is necessary not only to eliminate the concentration of advanced medical care facilities in urban areas but also to expand the functions of health centers and sub-centers in provincial areas. To this end, it is essential to nurture human resources capable of meeting the local communities' basic needs, both qualitative and quantitative, for medical care services.

(6) Budget

Year-to-year changes in the budget for health, welfare and family planning as a percentage of the national budget medical services during the 5-year period from 1983/84 to 1987/88 are as shown in the table below.

Table 10 Changes in the budget for health, welfare and family planning

Unit: billion RP

	1983/84	1984/85	1985/86	1986/87	1987/88
Health, welfare, family planning	344.0	408.0	413.4	311.6	207.7
Budget for development	9,240.3	10,459.3	10,647.0	8,296.0	7,756.6
Component ratio (%)	3.7	3.9	3.8	3.7	2.7
Growth rate (%)		18.6	1.3	-24.7	-33.3

Source: Central Bureau of Statistics

Note: The national budget is devided into current expenditure and development expenditure.
The budget for development is devided into projects and RP expenditures in order to cover the local costs for the projects.

The average percentage distribution for the period from 1983/84 to 1986/87 was 3.77 percent, while in 1987/88 it declined sharply to 2.7 percent. On the other hand, there has been a remarkable slowdown in the growth of the health-related budget as well as drastic declines in the size of the budget itself since 1986/87. These facts are attributable to the nation's financial difficulties as indicated by the trends in the nation's balance of payments (See table 11).

Table 11 Changes in the balance of payments (1982-1987)

Unit: million dollars)

	1982/83	1983/84	1984/85	1985/86	1986/87 (Estimation)	1987/88 (Budget)
I Products and services						
1. Export (FOB)	18,672	19,816	19,901	18,612	13,697	15,091
Oil, gas	14,744	14,449	13,994	12,437	6,966	7,489
Non-Oil & non-gas	3,928	5,367	5,907	6,175	6,731	7,602
2. Import (FOB)	Δ 20,620	Δ 16,304	Δ 14,427	Δ 12,552	Δ 11,451	Δ 11,220
Oil, gas	Δ 4,801	Δ 3,489	Δ 2,797	Δ 2,474	Δ 2,095	Δ 2,318
Non-oil & non-gas	Δ 15,824	Δ 12,815	Δ 11,630	Δ 10,078	Δ 9,356	Δ 8,902
3. Services (Net)	Δ 5,086	Δ 7,663	Δ 7,442	Δ 7,892	Δ 6,297	Δ 6,507
Oil, gas	Δ 2,777	Δ 3,589	Δ 3,381	Δ 3,840	Δ 2,287	Δ 2,322
Non-oil & gas	Δ 2,309	Δ 4,074	Δ 4,061	Δ 4,052	Δ 4,010	Δ 4,185
4. Current balance	Δ 7,039	Δ 4,151	Δ 1,968	Δ 1,832	Δ 4,051	Δ 2,636
Oil, gas	7,166	7,371	7,816	6,123	2,584	2,845
Non-oil & Non-gas	Δ 14,205	Δ 11,522	Δ 9,784	Δ 7,955	Δ 6,635	Δ 5,485
II Balance of capital account	5,880	5,974	2,762	2,360	4,575	2,636
1. Public loans	5,011	5,793	3,519	3,432	5,472	5,187
2. Others	1,795	1,191	499	572	1,232	178
3. Repayments	Δ 926	Δ 1,010	Δ 1,292	Δ 1,644	Δ 2,129	Δ 2,729
Total (I - II)	Δ 1,159	1,823	758	528	524	-
III SDR	-	-	-	-	-	-
IV Errors & omissions	Δ 2,125	247	Δ 91	Δ 498	Δ 1,262	-
V Overall balance	Δ 3,280	2,070	667	30	Δ 738	-
Foreign currency reserves (end of fiscal year)	3,074	5,144	5,811	5,841	5,103	-

Source: The 1987 Budget Massage and document attached to the president address of the Independence Day (17th August, 19

2-3-2 Present Situation of Emergency Medical Care

(1) Characteristics of Demand for Emergency Medical Care in Indonesia

Details of the growth rate for emergency medical care demand in Indonesia are unknown. The say that the annual growth rate ranges by from 15 to 20 percent. Underlying such a rapid increase in demand for emergency medical care are the rapid increase (about 2 percent annual growth rate) in the nation's population's and the population concentration in urban areas. The table below shows year-to-year changes in the numbers of residents of urban and rural areas during the 1971-88 period. It is expected that soon, about one-thirds of the nation's total population will be living in urban areas.

Table 12 Changes in the number of residents in urban and rural areas (rates)

Unit: million persons

	1971 [1]	1980 [1]	1983 [2]	1988 [2]
Urban	20.7 (17%)	32.8 (22%)	37.9 (24%)	48.4 (28%)
Rural	98.5 (83%)	113.9 (78%)	120.2 (76%)	127.2 (72%)
Total	119.2 (100%)	146.7 (100%)	158.1 (100%)	175.6 (100%)

Source: Central Bureau of Statistics.

Note: (1) Survey in 1971 and 1980.

(2) Estimation in 1983 and 1988.

The increase in the influx of population into urban areas is being accelerated by the expansion of new employment opportunity which is a result of urbanization and industrialization. This fact is reflected in the recent changes in the nation's pattern of employment. An analysis of the pattern of employment on the basis of the results of the 1985 Census shows that 54.7 percent of the total number of jobholders were engaged in agriculture, forestry, and fishery, which means that employed population concentration in these sectors is still high. But this figure represents a considerable decrease from the 66 percent recorded in 1978. In recent years, the rate of employed population growth for urban type sectors such as manufacturing, commerce, and restaurants has been far higher than that

for these sectors. This is additional evidence of the expansion in employment opportunity in urban areas. (see Table 13)

Table 13 Chenges in the pattern of employment (1976-1985)

	1976		1980		1985	
	Persons (thousand)	Component ratio (%)	Persons (thousand)	Component ratio (%)	Persons (thousand)	Component ratio (%)
Employees	53,433	100.0	51,553	100.0	62,475	100.0
Agriculture, forestry, and Fishing	35,258	88.0	28,834	55.9	34,142	54.7
Mining	44	0.1	387	0.8	416	0.7
Manufacturing	3,560	6.7	4,680	9.1	5,796	9.3
Electricity, gas and water	34	0.1	66	0.1	70	0.1
Construction	1,098	2.1	1,657	3.2	2,096	3.3
Commerce and restaurants	6,253	11.7	6,679	13.0	9,345	15.0
Transport, storage and communication	1,112	2.1	1,468	2.8	1,958	3.1
Financing, real estate and business services	74	0.1	302	0.6	250	0.4
Public services	5,157	9.6	7,145	13.9	8,317	13.3
Others	853	1.6	334	0.6	67	0.1

Source: Census of Central Bureau of Statistics (1976, 1980, 1985)

There has also been marked progress in the motorization of the country, in keeping with population concentration in urban areas and the change in the patterns of employment. An analysis of year-to-year changes in the number of registered motor vehicles between 1983 and 1986 shows that approximately 1,440,064 units (a yearly increase of 40,084 units) were newly registered throughout Indonesia approximately 218,000 units (a yearly increase of 7,0034 units) in the Jakarta metropolitan area alone, during the 3-year period. (see Table 14)

Table 14 Numbers of registered motor vehicles (1983-1986)

	1983		1986	
	Whole country	Jakarta metro-politan area	Whole country	Jakarta metro-politan area
Passenger cars	862,424	299,164	1,063,959	356,188
Buses	160,260	62,515	256,574	111,147
Trucks	717,873	126,859	882,331	154,498
Motorcycles	4,135,677	628,414	5,118,907	713,063

Source: State Police Indonesia

Table 15 shows the relationship between the increase in the number of registered motor vehicles and the number of traffic accidents from 1983 to 1987 in the Jakarta metropolitan area. While the number of traffic accidents and that of injured persons did not necessarily increase in proportion to the increase in the the number of motor vehicles, the increase in the number of fatally injured persons outpaced that of slightly injured persons. In light of this fact, the Government of Indonesia is now expediting the improvement and expansion of the nation's emergency medical care system, as well as the improvement of measures designed to cope with the increase in the number of traffic accidents.

Table 15 Changes in the number of traffic accidents in the Jakarta metropolitan area (1984-1987)

	1984	1985	1986	1987
Registered motor vehicles	1,213,352	1,285,608	1,334,896	1,378,458
Traffic accidents	6,388	5,591	5,122	4,182
Injured persons	2,222	1,812	1,842	1,357
Slightly injured persons	3,437	2,983	2,439	2,438
Fatally injured persons	479	480	458	741

Source: Metropolitan Transport Bureau

Recent urbanization and industrialization in Indonesia have brought about not only changes in the social life in urban areas but also the expansion of densely populated areas, the deterioration of the living environment, and increases in traffic accidents, fires, and workplace disasters. As in all industrialized nations, these things frequently cause accidents and diseases. This in turn has remarkably increased the general public's demand for emergency medical care services as well.

Table 16 shows explains some of the emergency medical care activities in 1987 undertaken by the RSCDM Emergency Medical Care Center, which was established in Jakarta in 1986 through a grant-in-aid from the Japanese

Government. Characteristic of the center's emergency medical care activities are as follows.

i. Although the center was originally designed to function as a top referral hospital where emergency treatment of tertiary-level illness would be performed, it is actually visited by many outpatients, people who account for more than 90 percent of the total number of patients visiting it.

ii. Approximately 90 percent of the total number of out patients visiting it were slightly injured patients who were able to return home on their own.

iii. The ratio between the non-surgical departments and the surgical department was about 6 to 4.

iv. Of the total number of patients treated at the surgical department, 21.3 percent were patients injured in traffic accidents. In other words, 1 every 9 of total patients visiting it was such patients.

v. Of the total number of patients treated at the non-surgical departments, approximately 67 percent were treated at the obstetrics and gynecology department.

Table 16 Activities of the RSCM Emergency Medical Care Center (1987)

Unit: person

	Total number of patient	Outpatients		Non-surgery's patients	Surgery's patients	Traffic accidents	Non-traffic accidents	DOA	DOA	
		Ordinary	Referral						Traffic accidents	Non-traffic accidents
Jan.	5,253	4,720	533	3,103	2,150	469	1,681	46	7	39
Feb.	5,244	4,743	501	3,208	2,033	451	1,582	54	15	30
Mar.	5,810	5,229	581	3,601	2,209	511	1,698	40	10	30
Apr.	5,509	4,906	603	3,223	2,286	567	1,719	41	11	30
May	5,591	5,086	505	3,180	2,411	507	1,904	50	16	34
June	4,997	4,558	439	2,899	2,098	377	1,721	58	16	42
July	5,254	4,672	582	3,002	2,249	438	1,811	53	13	40
Aug.	5,404	4,937	467	3,220	2,181	445	1,736	48	9	39
Sept.	5,474	4,914	560	3,152	2,031	425	1,606	68	15	53
Oct.	5,242	4,777	465	3,206	2,036	499	1,537	64	7	57
Nov.	4,826	4,304	522	2,940	1,916	372	1,544	51	9	42
Dec.	5,042	4,605	473	3,012	2,030	379	1,651	52	12	40
Total	63,337	57,106	6,231	37,747	25,600	5,450	20,150	625	140	485
Ratio	(100)%	91.2%	9.8%		(100)%	21.3%	78.7%	(100)%	22.4%	77.6%

Slightly injured persons (return home) 56,320 (88.9%/Annually total number of patients)
Seriously injured persons (hospitalize) 7,027 (11.1%/Annually total number of patients)
DOA = Death within 24 hours

Source: Statistics of RSCM

(2) Problems of Emergency Medical Care in Urban Areas

In the Jakarta metropolitan area, the study team visited such similar medical facilities as the RSCM Hospital, Fatomanati Hospital, Pusat Pertamina Hospital, Tarakan Hospital and Persahabatan Hospital, and on Bali the study team visited Sanglah Hospital, Gianyar Hospital, and Sanur Health Center. An outline of these medical facilities is given in 2-5-1 and 2-5-2 below. An analysis of the present condition of these medical facilities reveals that the incompleteness of the referral and the emergency transportation/communications systems, as well as the relatively low level of public health and nutrition are the major problems common in emergency medical care in urban areas. Further details of this are as follow:

① Referral System

Most of the patients visiting or taken to even a tertiary emergency medical care institution, like the RSCM Emergency Medical Care Center, are only slightly ill or slightly injured. They are able to return home on their own after receiving medical examination and/or treatment. This would be conceivable in industrialized nations. It implies that the nation's referral system is not fulfilling its own functions even in the metropolitan areas. One of the reasons for this is that few of the public hospitals provide medical care services for outpatients after 2:00 p.m. The result is that many patients must visit the emergency units of these hospitals which in principle operate around the clock. It should also be noted that the level of medical care services provided by lower hospitals (Class B to D hospitals) is low. Few of these hospitals are furnished with sufficient facilities, equipment, or personnel.

In light of the basic goal of the nation's medical care policies to "supply effective medical care services," and because of the need to cope with the rapid increase in the number of patients injured in traffic accidents in urban areas, it is imperative that the facilities of not only the top referral hospital but also lower hospitals which are ranked hierarchically be expanded and improved, in order to build a more effective referral system.

② Emergency Transportation/Communications System

The fact that so many emergency patients are taken to well-known medical facilities regardless of the seriousness of their diseases or injuries is evidence of the incompleteness of the emergency transportation/communications system designed to support the referral system. The lower the technical level of the hospital, the stronger the need to improve and expand the transportation/communication system. Judging from the current state of these hospitals' ability to receive emergency patients, however, it seems advisable to improve and expand at first the transportation/communications system for hospitals of the higher levels.

In the central part of Jakarta, citizens can utilize the 118 emergency call system provided voluntarily by the Indonesian Society of Surgery and the 119 pay emergency call system operated by the Health Department of the City of Jakarta. As the metropolitan area's telephone communication network is not functioning satisfactorily as of yet and telephone communication services are still not in widespread use, these emergency call systems are not utilized effectively.

The RSCM Emergency Medical Care Center is utilizing its own radio communication system in addition to the 118 system for emergency communications with its ambulances and with other hospitals in an effort to improve this situation. Furthermore, the center is utilizing amateur radio communication, but this has problems over short distances and because of interference.

There are two types of ambulances, those owned by hospitals and those operated by the Red Cross, yet there is a basic shortage of ambulancers. Not all ambulance cars are furnished with equipment for giving emergency treatment to patients while the patients are being transported to hospitals. In fact, most of them are used for transporting slightly ill or injured patients, or for transporting emergency medical care personnel.

③ Public Health, Nutrition and Others

It should be noted that, of the total number of emergency operations performed at the RSCM Emergency Medical Care Center as shown in the table below, approximately 33 percent were obstetric/gynecological operations.

The primary objective of public hospitals is to provide medical care services for low income people. Of the total urban population, 53 percent belongs to households with monthly per capita income of less than 10,000 Rp., and more than 75 percent of this income is spent on food. Because of this, it is obviously difficult for these individuals to afford medical care on a paid basis.

Table 17 Operation in the RSCM Emergency Medical Care Center (1987)

	Total number of operation	Scale of operation				Numbers of operation by department							
						Surgery	Nervous-surgery	Ortho-pedics	Pedi-atrics	Urology	Obsterics and Gyneco-logy	Ophtal-mology	Otorhino-laryn gology
Jan.	293	115	161	17	-	101	9	51	10	4	94	20	4
Feb.	296	99	198	19	-	113	10	37	11	16	89	8	10
Mar.	315	101	189	25	-	116	9	42	28	2	104	9	5
Apr.	284	113	152	19	-	105	10	41	9	3	104	10	2
May	330	124	174	32	-	94	12	48	22	4	127	14	9
June	283	112	152	19	-	111	15	23	14	2	100	11	7
July	272	102	160	10	-	96	9	31	28	3	83	17	2
Aug.	313	59	231	23	-	79	14	43	43	6	99	19	10
Sept.	318	72	224	22	-	98	11	33	29	4	121	15	10
Oct.	334	60	247	17	10	112	13	48	31	6	110	9	5
Nov.	303	59	225	5	14	98	16	43	29	5	86	13	12
Dec.	316	73	228	3	12	107	13	39	37	5	95	14	6
Total	3,657	1,089	2,321	211	36	1,230	144	482	291	60	1,212	159	82

Source: Statistics of RSCM

At the RSCM Hospital, the annual total number of childbirths was 2,500 in 1976, 4,320 in 1981, and 5,060 in 1982. The annual growth rate has averaged about 15 percent. A breakdown of the total number of childbirths in 1982 is shown in Table 18. As is shown in the table, most cases of childbirth at the hospital required emergency delivery. Many young pregnant women require emergency delivery because of infectious diseases attributable to the low level of public health, malnutrition, and to the incompleteness of education on health for mothers and children. In addition, few of pregnant women receive monthly medical examinations for financial reasons. The result is that they are taken to hospitals for emergency delivery due to some disorder immediately before childbirth.

Table 18 Childbirths (emergency cases) at the RSCM Hospital (1982)

Case	Ratio (%) with overlap
No examination for fetus	59
Emergency delivery	33
Referral from other hospitals	5.7
Referral from midwives	15.1
Metrorrhexis	4.3
Abnormal childbirth	60

Source: RSCM emergency medical care center

(3) Government's Emergency Medical Care Policies

In light of the above-mentioned problems and the factors underlying them, the Government of Indonesia is placing emphasis on the improvement and expansion of the wide-area referral system in an attempt to improve the nation's emergency medical care services. By doing this the Government hopes to establish a nationwide emergency medical care system in which primary, secondary and tertiary care services are integrated.

In the NHS announced in 1982 as well, top priority was given to the following three points as measures for improving the emergency referral system.

i. To establish an emergency unit within each Vertical Hospital and at the same time improve and expand the existing emergency units.

ii. To promote the establishment of a network for the emergency/transportation system.

iii. To improve the educational and training functions of educational hospitals (Class A and Class B1 hospitals) and at the same time enhance the level of educational and training programs for medical experts working at health centers, as well as Class D, Class C and Class B2 hospitals.

In order to improve and expand these wide-area emergency medical care systems, the Indonesian Government is promoting basic policies. These include "establishment of a sea link system," "improvement and expansion of top referral hospitals" and "introduction of a one-gate system."

① Sea Link System

The Government of Indonesia is in the process of moving beyond simply improving the quality of regional emergency medical care. It is doing this by expediting the establishment of a comprehensive emergency medical care system, in a bid to overcome the country's geographical barriers to good medical care. As an island country comprising more than 13,700 islands, it is in this way that the quality of the nation's emergency medical care services both in urban and rural areas will be upgraded.

The Government intends to establish wide emergency medical care zones to cover groups of islands in order to enhance the level of these wide-area regional emergency medical services. This system, proposed by the central government, is called the "sea link system." In the region to the East of Java, the four islands of Bali, West Nusa Tenggara, East Nusa Tenggara, and East Timor will constitute an integrated medical care zone.

② Improvement and Expansion of Top Referral Hospitals

According to the Indonesian Government's basic policies on emergency medical care, each medical care zone under the sea link system is supposed to have a Class A hospital. An "A" Class hospital is designed to serve as an educational hospital of the highest level and of the largest scale. As the central medical education institution of the medical care zone it is expected to be instrumental in providing education and training programs for medical students (considered indispensable in maintaining the wide-area emergency medical care system), as well as in-service training programs for medical experts working at lower medical facilities.

There are no independent hospitals specializing in emergency medical care in Indonesia. Generally, emergency medical facilities belong to the emergency units of policlinic hospitals. Therefore, the emergency unit of a Class A hospital is positioned as a top referral hospital to provide

tertiary emergency medical care services under the nation's referral system.

Under such circumstances, the Indonesian Government intends to improve and expand top referral hospitals, as well as improve the quality of medical services provided by lower hospitals, so that these medical facilities may recover their functions as top referral hospitals, -- tertiary emergency medical care functions, educational functions and R&D in the areas of technologies and policies related to the promotion of emergency medical care services suited to the country's current state of medical care.

③ Introduction of the one-gate system

The Government of Indonesia is endeavoring to establish the so-called "one-gate system" which is a system for operating the emergency units of top referral hospitals. Under the one-gate system, all emergency patients are first taken to an emergency medical care center. Such centers have been established as independent emergency medical care facilities for diagnosis and/or treatment within top referral hospitals.

The function of an emergency medical care specialist is not yet firmly established in Indonesia. Furthermore, the emergency unit of top referral hospitals has been divided into surgical and internal medicine divisions. Given this arrangement, emergency medical care for patients taken to the pediatric department is conducted at the pediatric ward. Likewise, emergency medical care for patients taken to the obstetric and gynecological department is effected at the obstetric and gynecological ward. Emergency patients are received at various wards, instead of at a centralized reception counter. This prevents the emergency unit from functioning effectively as an emergency medical care center. The RSCM Emergency Medical Care Center represented the nation's first attempt to resolve this problem. The result is that the center has been able to function efficiently as a centralized emergency medical care institution, drastically reducing the death rate in emergency cases handled by the center. This fact indicates that the further spread of the one-gate system will greatly contribute to the improvement of tertiary emergency medical care as a basic medical care method in the country.

2-3-3 Demand for Emergency Medical Care and the Emergency Medical Care System on Bali Island

As has been already mentioned, the area consisting of the four islands (provinces) of Bali, West Nusa Tenggara, East Nusa Tenggara and East Timor is called the Nusa Tenggara region. It is positioned as an integrated medical care zone under the nation's sea link system. On Java, which is one of the most densely populated and modernized provinces of Indonesia, Class A hospitals in Jakarta, Surabaya and other big cities have already been functioning as top referral hospitals. A relatively advanced emergency medical care network centered around these hospitals has been established. In the region such an advanced medical care system is not yet established. (see Table 19)

Table 19 Indicators of social and medical facilities in Tengarra region (1985)

Islands	Population	Population density (person/km)	Registered motor vehicles (Motorcycle rates)	Hospitals (include clinic)	Beds	Health centers	Remarks	
Bali	2,649,000	467 (Badung district) 1,037	167,283 (11%)	23 (public 13)	2,155 (public 1,910)	82	Class B1 Hospital (Teaching)	1
							Class C Hospital	3
							Class D Hospital	4
West Tengarra	2,995,000	148	44,648 (72%)	14	776	95	Class B2 Hospital	1
							Class D Hospital	4
East Tengarra	3,061,000	64	28,694 (65%)	25	1,602	149	Class C Hospital	1
							Class D Hospital	12
East Timor	631,000	42	14,782 (74%)	5	446	61	Class C Hospital	1
							Class D Hospital	2

Source: Central Bureau of Statistics

In implementing its policy for improving and expanding the nation's wide-area emergency medical care system, the Indonesian Government has been placing primary emphasis on the improvement of the sea link system and the emergency medical care services in the region. Of the 4 provinces constituting this region, Bali (Province) has the highest population density and is confronted with growing public demand for emergency medical

care. This reflects the progress of modernization and the rapid increase in urban population in the area where Denpasar, the capital of the province, is located.

(1) Background of the Region's Growing Demand for Emergency Medical Care

1) Measures to Cope with Frequent Incidence of Infectious Disease and Primary Emergency Care for Patients Contracting These Diseases

On Bali, measures to cope with the frequent incidence of infectious disease are as important as general medical care services. There has been an increase in the number of those diseases which occur frequently in industrialized nations, such as adult diseases and heart failure as would be expected because of the area's modernization in its urban districts. Infectious and endemic diseases are still prevalent however in its rural districts. Statistical data from 1983 through 1987 indicates, that except for cholera, there has been no significant decline in the number of cases of these diseases. Few patients suffering from these diseases receive early diagnosis or treatment. The result is that most of them are taken to hospitals after their diseases have reached their terminal stage. Therefore, it is also necessary to step up measures to improve the functions of the internal medicine departments of the hospitals on the island. (see Table 20)

Table 20 Number of patients suffering from infutions diseases (by region) (1987)

District	Tuberculosis	Cholera	Malaria	Lepra	Dengue	Typhoid fever
1. Jembrana	69	2	84	-	-	239
2. Tabanan	43	-	6	6	10	351
3. Badung	281	-	15	14	53	2,595
4. Gianyar	108	-	5	1	46	792
5. Klkungkung	50	-	55	10	10	494
6. Bangli	19	-	-	3	-	317
7. Karangasem	132	-	246	15	3	320
8. Buleleng	116	-	101	10	20	1,390
Whole Bali Island						
1983	745	181	351	54	54	9,729
1984	774	41	286	60	138	5,827
1985	867	65	181	56	141	7,206
1986	973	64	245	75	153	6,009
1987	818	2	512	59	142	6,507

Source: Health Bureau, Bali province

Table 46 in 2-4-2 is an outline of the surgical operations performed at the existing emergency unit of the RSUP Sanglah Hospital during 1987. It should be noted that, of the total number of operations (7,434), 1,506 (20.3 percent) were operations related to childbirth. This is indicative of the fact that pregnant women in Indonesia do not receive regular medical examinations, and many of them are only taken to hospitals immediately before the expected date of delivery. It also implies that in comparison with industrialized countries, Indonesia has a relatively large number of cases of early childbirth, abnormal delivery, and neonatal defects. These facts support the case for greatly enhanced OB-GYN services.

Table 50 shows a breakdown of the total number of deaths of patients treated at the internal medicine departments of emergency units. Shock tops the list, followed by asthma, fever, colic pain, convulsion, pneumonia, the diseases of the digestive organs and enteric fever.

It can be said that the current state of emergency medical care on Bali is characterized by coexistence of serious cases of disease, disease

requiring primary emergency medical care, and those diseases which are not considered emergencies in industrialized nations. It is equally important, therefore, to improve the emergency medical care services for patients suffering from these diseases.

2) Urbanization and Population Growth

Bali has a population of approximately 2,618,400 (1987). The population density on the island is 465 persons/km^2, which is the second highest in Indonesia after the 755 persons/km^2 of Java. The district and the district, adjacent to Badoun, both have very high population densities, 1,037 persons/km^2 and 867 persons/km^2 respectively. The two districts are being rapidly urbanized. As all of the other 7 districts on the island are rural districts, the influx of population into Denpasar is responsible for the extreme population concentration in the capital. Denapasar is now the largest city in the region. (see table 21)

Table 21 Distribution of population in the Bali island (1980-1987)

District	Area (km)	Population (person)			Population density (person/km)	
		1980	1987	Growth rate(%)	1980	1987
1. Jembrana	841.80	204,963	202,207	(-1.3)	244	245
2. Tabaman	839.33	342,823	348,092	(1.5)	397	415
3. Badung	542.50	504,337	562,397	(11.5)	930	1,037
4. Gianyar	368.00	306,129	319,185	(4.3)	832	867
5. Kulungkung	315.00	148,747	153,933	(3.5)	472	489
6. Bangli	520.81	161,542	171,214	(6.0)	311	329
7. Karaengasem	839.54	314,316	340,561	(8.3)	365	406
8. Buleleng	1,365.88	487,003	516,780	(6.1)	369	278
Whole Bali island	5,632.88	2,469,930	2,618,369	(6.0)	438	465

Source: Statistical Bureau, the Bali Province

The urbanization phenomenon is reflected not only in the population distribution on the island but also in the changes in the islanders' social life, particularly the accelerated motorization. As a result, there has recently been a marked increase in the number of traffic accidents and persons injured in them. In 1987, the number of traffic accidents for every 10,000 persons was 5.7 and that of deaths in traffic accidents for every 10,000 persons was 8.1, both which were larger by far than the 4.9 and 5.3 level of Jakarta. (see Table 22)

Table 22 Traffic accidents in the Bali island

( ): Budung

	1984	1985	1986	1987
Motorcars	162,432	163,163	180,533	183,102
Traffic accidents	NA	1,412	1,531	1,504
	(406)	(424)	(657)	(582)
Serious injuries (person)	NA	739	966	836
	338	(402)	(562)	(447)
Light injuries (person)	NA	1,286	1,318	982
	(314)	(304)	(500)	(377)
Death (person)	NA	238	265	296
	(91)	(68)	(92)	(95)

Source: State Police Indonesia

3) Measures to Cope with Disasters

Although Bali climate is tropical, the mountainous district in the center of the island has a tropical rain forest climate. The island's peripheral area has a tropical monsoon climate, and the district along its northern coast a savanna climate, reflecting the island's varied geographical characteristics. The island is often hit by natural disasters such as floods, storms, and landslides during the rainy season. Part of the island belongs to the Pacific rim volcanic chain and some active volcanoes exist. In 1963, the island was hard hit by the violent eruption of Mount Agun, which claimed approximately 40,000 lives and caused significant other damages.

Furthermore, according to data from the Central Bureau of Statistics, there are 15 active volcanoes on the island which are in danger of erupting. The total land area likely to be damaged if an active volcano should erupt amounts 6,728km^2. The total land area very likely to be damaged in such a case is 1,643km^2. These facts point to a need to establish a contingency plan to cope with natural disaster of this kind.

Table 23 shows a breakdown of the natural disasters that occurred between 1982 and 1987 on the island. Although no earthquake was recorded during the period, there is every likelihood that the island will be hit by earthquakes.

Table 23 Damages by natural disaster in the Bali island (1982-1987)

	Floods	Storms	Land slides	Earth-quakes	Drought	Pollution	Total
1982	1	9	2	-	7	13	21
1983	3	18	7	-	13	2	43
1984	4	12	1	-	15	3	35
1985	6	31	2	-	25	7	71
1986	6	17	6	-	13	4	46
1987	-	18	4	-	14	5	41
Total	(20)	105	22		87	23	257

Source: Statistical Bureau, the Bali Province

4) Increase in Air Transport

In recent years, the Government of Indonesia has been actively promoting the tourist industry for the purpose of gaining foreign currency. Bali, in particular being blessed with various tourist resources, is positioned at the core of the nation's tourist promotion effort. The number of tourists visiting the island has been increasing steadily. Most of them are foreign tourists. (see Table 24)

Table 24 Number of foreign travellers (1984-1987)

Year	Whole Indonesia	Bali Island	Ratio
1984	700,910	189,460	27%
1985	720,600 (+ 2.8%)	211,244 (+11.5%)	29%
1986	825,035 (+14.5%)	243,354 (+15.2%)	29%
1987	1,050,014 (+27.3%)	309,294 (+27.1%)	

Source: Immigration Bureau, the Bali Province

Table 25 shows the recent pattern at utilization at the Denpasar International Airport. It is clear from the table that both the cargo and passengers arriving at and departing the airport are on the increase.

Table 25 Use of international airport (1986, 1987)

	1986	1987
(Cargo handling : Ton)		
Shipping	1,992	4,441 (+123%)
Loading	460	380 (- 21%)
(Travellers : person)		
Departure	274,495	376,870 (+37.3%)
Arrival	280,984	352,028 (+25.3%)
Transit	94,274	81,051 (-16.3%)

Source: Air Transport Indonesia

The Government of Indonesia expects that the number of foreign tourists visiting the island will exceed the 1.2 million mark by 1988/89, the last year of the current 4th Five-year National Development Plan. To meet the increased demand for air transport, the Government is in the process of increasing the number of international air routes to and from Bali, the island blessed with the most ideal tourism resources. They are working to both increase flights on these international air routes, as well as to improve and expand the nation's other tourist facilities.

Any increase in air transport, however, is very likely to be accompanied by an increase in the number of airplane accidents. For this

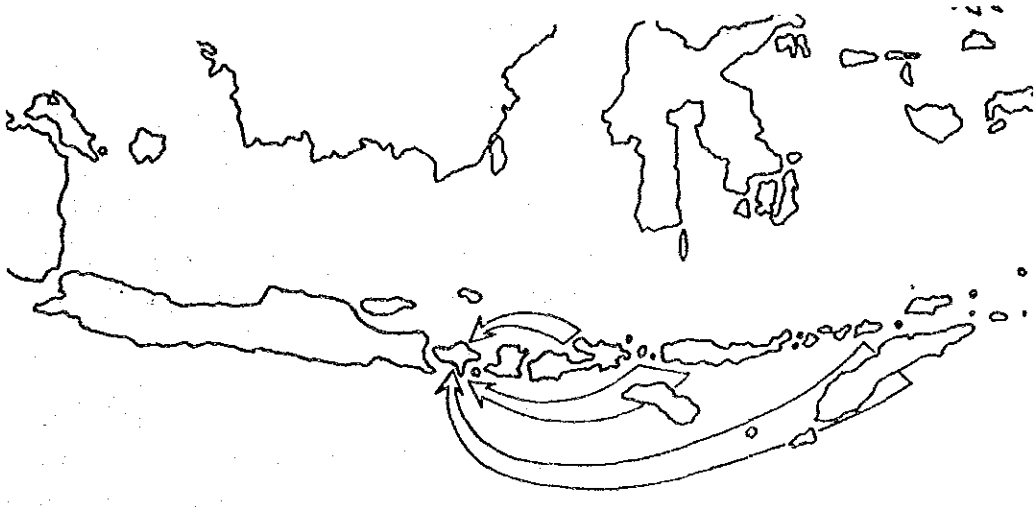
reason, it is necessary to work out and implement a full-scale contingency plan to cope with large-scale air traffic accidents, just as is true in the case with natural disasters.

(2) Emergency Medical Care System on Bali

The current state of the medical facilities in the region, which includes Bali, is as shown in Table 19. Judging from the results of the study team's survey of similar medical facilities in the region, neither of the present level of medical care, nor the scale of medical facilities, the number of medical experts, or the authorities' effort to raise the level of medical care service at large is satisfactory. The future direction of medical care on Bali is essential to the improvement of the emergency medical care services in this region.

In fact, the Indonesian Government has designated some of the higher medical institutions on Bali as provincial- level top referral hospitals to cover not only Bali island, but also the provinces of West, East Nusa and East Timor. It is imperative to improve and expand the emergency medical care system on Bali from the standpoint of improving the wide-area emergency medical care service, as well as to reinforce the sea link system. (see Fig. 2)

Fig.- 2 Provincial Referrel System in Nusatengara



The present situation at the medical institutions on Bali is as outlined in Table 26. Hospitals of the Class C level or higher (with more than 200 beds) are concentrated in districts with relatively high population density. In rural and remote districts, on the other hand, health centers, sub-centers and circumference health centers are responsible for emergency medical care in addition to general medical care, for reasons of the residents' income level, and lack of available means of transport for visiting hospitals.

Table 26

	District	Population (Person)	Population density (person/km)	Number of hospitals (beds) Public hospitals	Private hospitals	Total	Health center & medical duty staff Health center	Physician	Dentist	Total	Paramedical	Sub center
Jembrana	4	206,207	245	1 (105)		1 (105)	9	9	4	13	128	20
Tabanan	8	348,094	415	1 (124)	2 (52)	3 (176)	12	10	3	13	221	52
Badung	7	562,397	1,037	4(*) (982)	7 (226)	11 (1,208)	15	22	6	28	353	47
Gianyar	7	319,185	867	1 (94)	-	1 (94)	12	13	2	15	189	35
Klungkung	4	153,933	489	1 (126)	1 (25)	2 (151)	7	6	1	7	137	37
Bangli	4	171,214	329	2(**) (277)	-	2 (277)	6	7	-	7	116	39
Karangasen	8	340,561	406	1 (60)	-	1 (60)	11	12	1	13	171	40
Buleleng	9	561,780	378	1 (262)	1 (24)	3 (286)	19	17	2	19	243	48
Total	51	2,618,369	465	12 (2,030)	11 (327)	24 (2,357)	91	96	19	115	1,558	318

Source: Government of the Bali Province

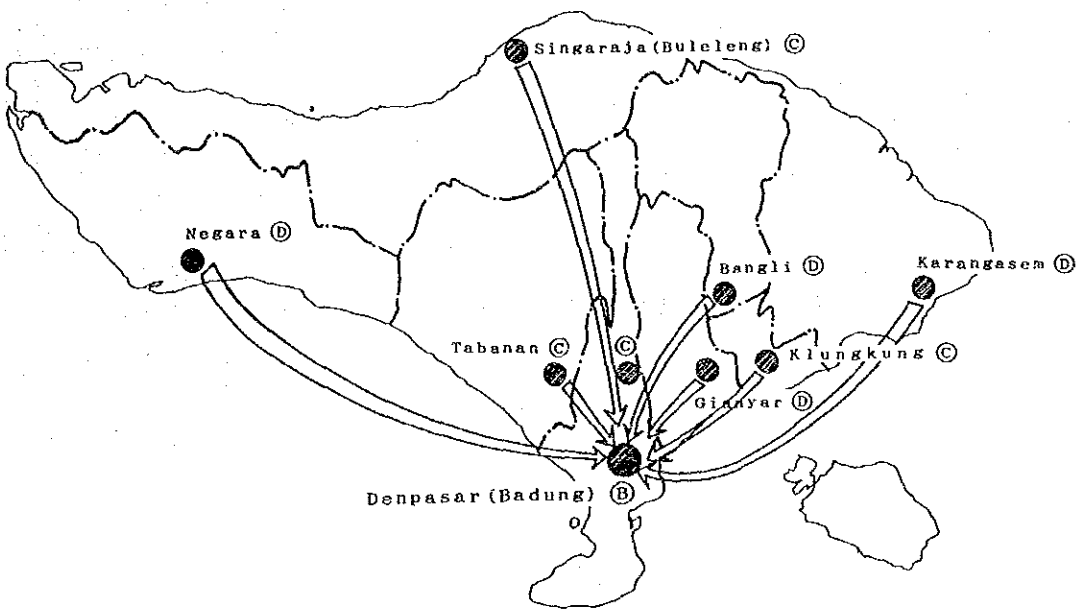
Nine public hospitals under the supervision of the Government consist of Class B2 (1), Class C (4) and Class D (4).
(*) 2 public hospital and 1 special hospital (leprosy) 1 army hospital
(**) 1 public hospital and 1 special hospital (mental)

However, none of these medical facilities is satisfactory in terms of the either scale of either facilities, equipment, or personnel. Even relatively minor cases of emergency disease or injury, their patients are often referred to Class C or Class D hospitals.

On the other hand, under the referral system operated by the 8 hospitals which are under the direct control of the central government on Bali, (as outlined in Fig. 3), the Sanglah Hospital in Denpasar is functioning as the top referral hospital. An outline of the hospital is given

in 2-3 below. The hospital is classified as a Class B2 hospital according to the classification system used for the nation's public hospitals. It also serves as the educational hospital of Udayana University.

Fig.- 3 Location and Referrel System of Government Owned Public Hospitals in Bali



The total number of patients referred to the Sanglah Hospital during 1987 is as shown in Table 27. The ratio of this number to the total annual number of patients accepted by the hospital during the same year was 12.5 percent. On the other hand, its ratio to the total annual number of outpatients accepted by the hospital during the same year was 14.8 percent. Furthermore, the fact that about 50 percent of the total number of patients, referred to the hospital, both outpatinets and inpatients, were further referred to other hospitals shows the extremely frequent incidence of referral of patients to this hospital regardless of the seriousness of disease or injury.

Table 27 Patients referred to Sanglah Hospital (1987)

District	Outpatients		Inpatients		Total (%)
	Referral	Further referral	Referral	Further referral	
Badung	2,370	2,160	343	260	5,133 (59.4)
Tabanan	412	370	99	75	956 (11.1)
Sembrana	66	55	23	21	165 (1.9)
Buleleng	49	43	9	8	109 (1.3)
Karangasem	214	189	46	40	489 (5.7)
Klungkung	179	146	91	80	496 (5.7)
Bangli	79	75	43	33	230 (2.7)
Gianyar	376	338	144	126	984 (11.4)
Other	23	20	18	12	73 (0.8)
Total	3,768 (52.7%)	3,396 (47.3%)	816 (55.5%)	655 (44.5%)	8,635 (100)

Source: Sanglah Hospital

Remarks: Total number of outpatients (1987): 48,579
Total number of inpatients (1987): 19,824
Grand total 68,403
Patients in emergency per million persons (Japan):
300-400 persons/day in the first phase, 25-40 persons/day in the second phase, and 1-2 persons/day in the third phase.

These facts indicate that the wide-area referral system on Bali, which is designed to function smoothly as a hierarchical referral system, is not actually functioning in that way. In other words, most emergency patients are taken directly to Sanglah Hospital and/or its emergency unit irrespective of the seriousness of the disease or injury.

This extreme level of dependence on the Sanglah Hospital for emergency medical care services is a serious setback for the hospital as the island's top-level hospital, in light of the the present scale and capacity of the existing emergency unit. The present situation is working to reduce the hospital's emergency medical care capabilities and even to prevent its other clinical departments from functioning smoothly.

(3) Problems of the Emergency Medical Care System on Bali

1) Lack of Full-scale Top-Level Referral Hospitals

As stated in (3) of 2-3-2 above, the Indonesian Government's program for improving and expanding the wide-area emergency medical care system and that for establishing a full-fledged sea link system are closely, related to each other. According to the Government's overall plan, each integrated medical care zone under the present sea link system must have a Class A general hospital, which functions as a top referral hospital in the nation's referral system. The role such a hospital is supposed to fulfill includes responsibility for:

i. Provision of emergency medical care services of the highest level.

ii. Education and training of medical experts working at lower hospitals, medical students and paramedical staff.

iii. Various research and development activities in the area of emergency medical care.

At present, however, there is no Class A hospital in Bali or in the other provinces of the region. As a result, the Sanglah Hospital is forced to serve as a hospital equal in function and role to a Class A hospital despite the fact that the hospital is designed to function as a Class B1 hospital. Whether or not the emergency unit of the hospital can be equipped for the above-mentioned function and role is dependent on the establishment and improvement of a full-fledged sea link system as well as the realization of a network for the referral system.

2) Need for Decentralizing the Required Functions through Improvement and Expansion of Lower Hospitals

The level of medical care and the current state of the medical facilities and equipment of Class C and Class D hospitals on Bali, which is considered more advanced in terms of the scale and quality of medical facilities than any of the other provinces in the region, (West, East and East Timor) is as described in 2-4-3 below. The present condition of

these Class C and Class D hospitals on the island is not necessarily satisfactory enough to help reduce the burden imposed on Sanglah Hospital.

Additionally, judging from factors such as the number of patients referred to the Sanglah Hospital from these lower hospitals, the relatively large number of patients suffering from infectious diseases, and the current pattern of demand for emergency medical care, the improvement and expansion of lower hospitals is indispensable in order to improve the level of medical care in the service areas covered by these hospitals, and to build a full-fledged wide-area emergency medical care network, or referral system.

Given the background of the current nationwide shortage of medical experts, one of the policy measures most important for improving and expanding the facilities and capabilities of lower hospitals is to realize the effective use of existing human resources. In this sense, much is to be expected from the central government's current efforts to nurture emergency medical care personnel through education and training programs implemented at top referral hospitals.

3) Need for Improving the Current Emergency Communications/ Transportation System

The current emergency communications/transportation system for use in emergency medical care on Bali is similar to that which has been implemented in Jakarta.

In the area of emergency communications, radio communications have replaced telephone communications. In the case of Bali, the communications network connecting health centers, Class C and Class D hospitals, and the Sanglah Hospital is utilized for emergency communications via simple radio communications units, which are an improvement on conventional transceivers. One problem with this system is that emergency communications are possible only within a radius of about 10km, making it almost impossible to communicate with remote hospitals or health centers. Many hospitals own their own ambulances, but not all of them are equipped with radio communications equipment. Thus it is impossible to conduct good emergency communications with them.

Most medical facilities are dependent on ambulances cars for emergency transportation of patients. There are few urban-type ambulances which are equivalent in function to those used in Japan. They are often not furnished with medical equipment necessary for primary emergency medical care. Most of the local ambulance cars are small van-type vehicles which are usually utilized for transportation of emergency patients. Unfortunately, the recent increase in the volume of wheeled traffic in urban areas has been a great hindrance to the smooth functioning of ambulance cars in these areas. Emergency patients are often transported to hospitals by taxi or other more convenient means of transport.

To overcome these drawbacks, it is necessary to establish a wide-area emergency communications network as well as improve the systems for effectively operating ambulances and realizing smooth primary emergency medical care.

In emergency communications and transportation between Bali and the other islands in the region, amateur radio communications and traveling emergency boats are utilized. Since their operation is greatly affected by weather and geographical conditions peculiar to this region, they are not so efficient or flexible in emergency cases.

Although it is very-clear that the emergency communications/transportation system is indispensable in establishing both full-scale sea link and wide-area referral systems, they has not yet been realized due mainly to budgetary constraints.

2-3-4 Present Situation in Nation's Medical Care Administration

(1) Organizational System

The Ministry of Health is responsible for central health and medical care administration at the national level. It consists of the following four directorate generals and the directorates that support them. The organization is shown in Fig 4.

Directorate General of Medical Care
Directorate General of Disease Control
Directorate General of Food and Drugs
Directorate General of Community Health

The local health and medical care administration at the provincial level is under the jurisdiction of the Directorate General of Autonomy. It is placed under the direct control of the governor of the province who is appointed by the President of Indonesia and belongs to the Ministry of Home Affairs. Accordingly, the budgetary and personnel matters relating to medical care in provinces, regencies, municipalities, kecamatans and desas are controlled by the Ministry of Home Affairs.

Since, on the other hand, the Ministry of Health is responsible for general matters in the area of health and medical care, as well as actual medical care services both at the national and local levels, the Directorate of Local Health acts to smooth relations between the Ministry of Health and the Ministry of Home Affairs. The head of this organization holds the posts of Representative of MOH Office and head of the Provincial Health Office concurrently.

Under the nation's emergency medical care system, emergency medical care services are provided through hospitals, clinics (with more than 50 beds), health centers and other medical facilities. Therefore, emergency medical care services come under the jurisdiction of the Hospitals Directorate of the Directorate General of the Ministry of Health. However, the medical care activities at the provincial and prefectural levels are under the jurisdiction of the Directorate of Local Health, which has offices in provinces and regencies and for which the Ministry of Health and Ministry of Home affairs are responsible. The relationships between these organizations are outlined in Fig. 5.

Fig.- 4 Organizational Structure of the Ministry of Health

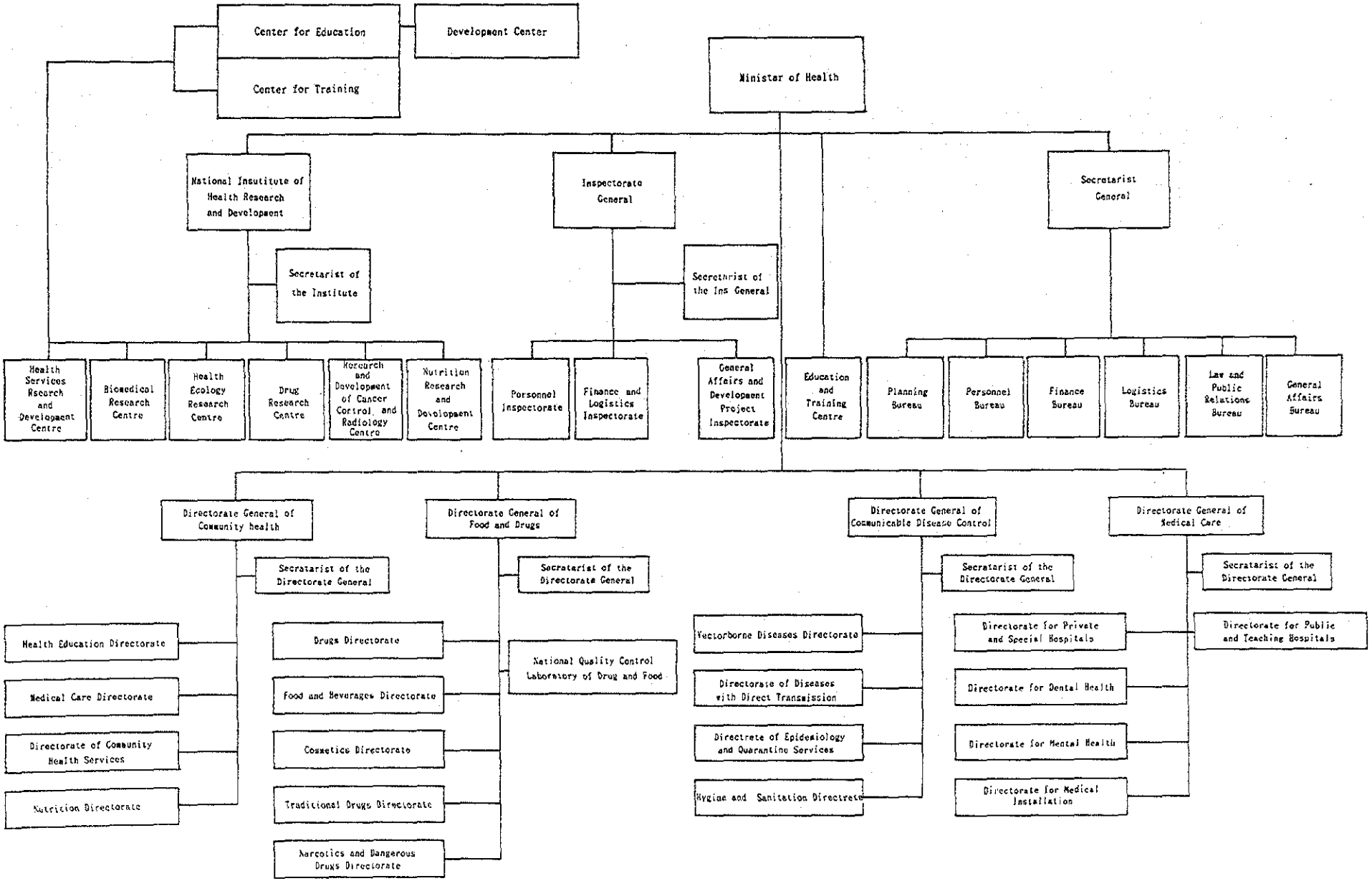
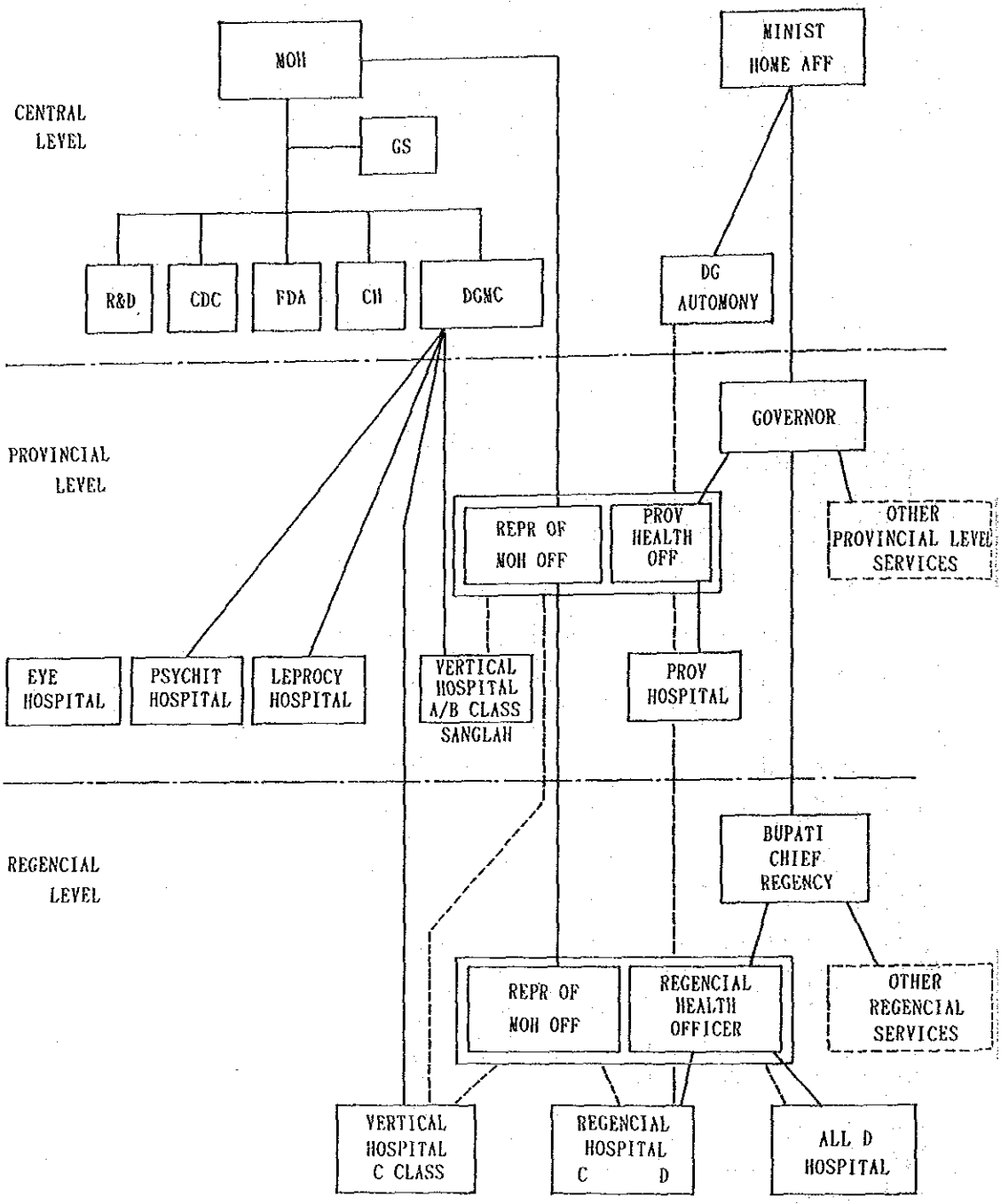


Fig. - 5 Organizational Relationships among Medical Institutions



(2) Development Projects Related to Emergency Medical Care

The development projects in the area of health and medical care which are currently being promoted by the Ministry of Health are all based on the basic goals of the NHS instituted in 1982. This NHS is positioned as a sub-system of the nation's five-year national development plan, and is therefore closely related to both the 3rd and the subsequent Five-year National Plans.

The core of the NHS is the "Long Term Health Development Plan". This is the system's master plan. It defines the levels and goals of various areas related to health and medical care to be attained from 1980 through 2000. This plan also defines the 12 projects to be implemented during the current 4th Five-year National Plan.

Of these 12 projects, some are specially emphasized as being closely related to the growing demand for emergency medical care, and/or the background of this (population growth, urbanization, community health, current level of medical care and so on). These can be outlined as follows.

① Medical Care Implementation Project

This project is aimed at increasing the number of health centers, at improving and expanding the Mobile Unit service so that they may help the enhance the quality of medical care services provided by health centers, at expanding the scope of their activities, promoting community residents' participation, and at the maximization of overall medical care services in the country. (see Table 28)

Table 28 Expansion of medical facilities in rural area

	Performance 1983/84	Planning 1988/89
1. Health center	5,353	5,853
2. Sub-center	13,636	19,636
3. Mobile Unit	2,479	4,000
4. Center with beds	128	296
5. Hospital beds (including center)	103,505	119,385

② Disease Prevention and Extermination Project

In this project, utmost emphasis is placed on the reduction of the rate of disease incidence (from 11.4 percent in 1980, to 9.1, then to 5.7 percent), on the improvement of measures to treat heart disease and lung cancer, on the prevention and extermination of diseases and on the more effective treatment of patients suffering from malnutrition by emphasizing the concept of nutritionally balanced diet. (see Table 29)

Table 29 Targets of disease prevention and extermination

Unit: million

	1983/84	1988/89
1. Malaria control		
a. Disinfection (house)	16.5	23.0
b. Treatment (person)	40.0	50.0
2. New pneumono pathy control	120.0	120.0
3. Cholera control (person)	1.1	27.7
4. BCG	16.5	23.8
5. Malnutrition control (person)	36,000.0	64,448.0

③ Increasing the Number of Medical Experts

Throughout the 4th Five-year National Development Plan, medical doctors, nurses, midwives and medical care assistants will be given opportunities to receive education and training in their respective fields of discipline. Furthermore, the total number of medical experts will be increased from 162,129 (as of 1983/84 the last year of the 3rd Five-year National Development Plan) to 283,898 by the end of the 4th Five-year National Development Plan.

Concerning placement of these medical experts: due consideration will be given to the current situation in each medical care zone as well as to the demand for medical care in cities where population concentration is a serious social problem, and to those regions in which measures to cope with the influx of residents from other islands are being taken (See table 30).

In the area of emergency medical care, the in-service training courses based on the education and training programs prepared by the Indonesian Association of Critical Care Medicine and adopted in 1986 by the Ministry of Health are being implemented.

Table 30 Plans for increasing medical duty staff

Unit: person

	1983/84	1988/89
1. Specialst	2,733	3,424
2. General practitioner	7,529	13,614
3. Dentist	1,292	1,773
4. Medical student (completed 6-year course)	1,219	5,283
5. Social medical center staff	44,651	76,238
6. Other medical staff	12,011	38,461
7. Medical assistant	29,433	50,461
8. Clerk	63,221	94,643
Total	162,129	283,897

In addition to the above-mentioned projects, the following are being implemented: the project for consumer education on medical care; the improved nutrition project; and the drinking water rationing project; Also the "improved environmental health project, and" the "project for more efficient medical care organizations," both of which are aimed at improving the general level of community health. How successful these projects have been will not be known until the next Five-year National Development Plan (now in the process of being formulated) is finalized and made public.

(3) Budget and Finance

Of the total budget of 145.2245 trillion Rp. for the current 4th Five-year National Development Plan, 78.6095 trillion Rp., or about 54 percent, is budgeted for development. And of the development budget, 3.5165 billion, or 4.47 percent, is for development projects related to

health, social welfare and family planning. In view of the fact that the budget for projects in these areas was 829.1 billion Rp., or 3.8 percent of the total development budget for the 3rd Five-year National development Plan, it seems the same budget under the current national development plan represents an increase of 2.6874 trillion, 4.2 times as large as that under the previous national development plan. However, it should be noted that the total development budget for the previous national development plan was 10.4593 trillion, about one-seventh of the size of the same budget for the current national development plan. Thus, the real rate of increase is 17.6 percent.

In addition to the above-mentioned development budget, there is a development-related budget available to the Ministry of Health from the national treasury. It is called the "recurrent budget." An outline of the trends in the budget for the 3 years from 1986/87 to 1988/89 and a breakdown of the budget for each of the 3 years is shown in Table 31.

Table 31 Annual revenues and expenditures of the Ministry of Health (1986/87-1988/89)

Unit: 1,000 RP

	1986/1987	1987/1988	1988/1989
Annual expenditures			
Current budget			
Budget for annual expenditure			
Personnel	76,846,000.0	83,253,000.0	95,932,000.0
Commodity	46,384,012.0	43,207,144.0	47,496,543.0
Maintenance	8,858,259.0	7,812,794.0	8,174,600.0
Traveling expenses & daily allowances	1,223,092.0	949,255.0	1,249,250.0
Unbudgeted expenses	5,513,237.0	4,993,237.0	5,193,237.0
Total operation costs	138,824,600.0	140,212,430.0	158,045,630.0
Total personnel expenses	61,987,600.0	56,959,430.0	62,113,630.0
Development budget	65,334,439.8	35,152,398.0	47,014,372.0
Total	204,159,039.8	175,364,828.0	205,060,002.0
Duty-free revenues	13,095,500.0	16,700,000.0	31,099,600.0

Source: the Ministry of Health