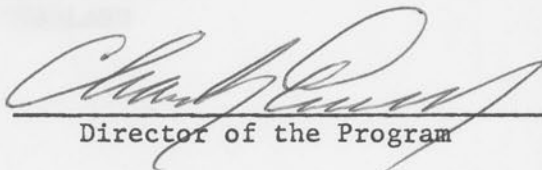




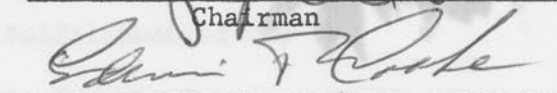
## TABLE OF CONTENTS

|                                                                                          |                                   |     |
|------------------------------------------------------------------------------------------|-----------------------------------|-----|
| LIST OF TABLES . . . . .                                                                 | RURAL HEALTH CARE<br>IN THAILAND  | 111 |
| Chapter . . . . .                                                                        |                                   |     |
| I INTRODUCTION . . . . .                                                                 |                                   | 1   |
| Footnotes . . . . .                                                                      |                                   | 3   |
| II THE PROBLEM . . . . .                                                                 |                                   | 6   |
| Statement of Purpose . . . . .                                                           | A Problem Solving Project Report  | 6   |
| Objectives . . . . .                                                                     |                                   | 6   |
| Criteria . . . . .                                                                       | Submitted to the Faculty of       | 6   |
| Reasons for the Study . . . . .                                                          | Baylor University                 | 6   |
| Facts Bearing on the Problem . . . . .                                                   |                                   | 7   |
| Assumptions . . . . .                                                                    |                                   | 7   |
| Definition . . . . .                                                                     | In Partial Fulfillment of the     | 8   |
| Research Methodology . . . . .                                                           |                                   | 8   |
| Literature . . . . .                                                                     | Requirements for the Degree       | 9   |
| Footnotes . . . . .                                                                      |                                   | 11  |
| III GEOGRAPHY, STANDARDS OF LIVING, TRADITIONAL MEDICAL BELIEF<br>AND PRACTICE . . . . . | of                                |     |
| Geography . . . . .                                                                      | Master of Hospital Administration | 12  |
| Standards . . . . .                                                                      |                                   | 15  |
| Traditional Medical Beliefs and Practices . . . . .                                      |                                   | 18  |
| Footnotes . . . . .                                                                      |                                   | 19  |
| IV ORGANIZATION AND FUNCTIONS . . . . .                                                  | By                                |     |
| Ministry of Public Health . . . . .                                                      |                                   | 21  |
| Central Administration . . . . .                                                         | COLONEL CHATRA BORVONSIN, MC      | 21  |
| Provincial Administration . . . . .                                                      |                                   | 23  |
| Bangkok City Hospitals . . . . .                                                         |                                   | 28  |
| Footnotes . . . . .                                                                      |                                   | 29  |
| V RURAL HEALTH SERVICES . . . . .                                                        |                                   |     |
| Rural Health Improvement Programs . . . . .                                              |                                   | 32  |
| Maternal and Child Health . . . . .                                                      |                                   | 34  |
| School Health . . . . .                                                                  |                                   | 35  |
| Provincial Hospitals . . . . .                                                           |                                   | 36  |
| Footnotes . . . . .                                                                      |                                   | 40  |
| VI PUBLIC HEALTH PROGRAMS AND FOREIGN AID . . . . .                                      |                                   |     |
| Health Education Materials . . . . .                                                     |                                   | 42  |
| Major Diseases and Disease Control . . . . .                                             |                                   | 43  |
| Mental Health . . . . .                                                                  |                                   | 52  |
| Medical and Public Health . . . . .                                                      | Waco, Texas                       | 53  |
| Foreign Aid - Health . . . . .                                                           |                                   | 53  |
| Footnotes . . . . .                                                                      | August, 1970                      | 53  |

APPROVED BY THE U. S. ARMY MEDICAL FIELD SERVICE SCHOOL:

  
Director of the Program

APPROVED BY THE PROJECT COMMITTEE:

  
Chairman  


APPROVED BY THE GRADUATE COUNCIL:

  
Dean of the Graduate School

DATE: August 21, 1970

## ABSTRACT

### RURAL HEALTH CARE IN THAILAND

A Problem Solving Project Report Submitted to the Faculty of Baylor University in Partial Fulfillment of the Requirements for the Degree of Master of Hospital Administration

By Colonel Chatra Borvonsin, MC

August 1970

78 pages

A copy of this document may be obtained on loan from the United States Army Medical Field Service School, Brooke Army Medical Center, Fort Sam Houston, Texas.

This study revealed that there is a lack of physicians, paramedical personnel, and hospitals in the rural areas of Thailand. In addition the health centers, dispensaries, and clinics in these areas are insufficient in number, are inadequately staffed, and are often inaccessible to a large portion of the population. Currently, practicing physicians are not completely familiar with the health problems peculiar to the rural areas, nor are they motivated to enter these areas.

The main recommendation is to train an adequate number of physicians for the rural areas of Thailand in order to provide for better health of the people, a lower mortality rate, a greater respect for health care, and an increase in the nation's supply of doctors. In order to achieve such desired objectives, more medical schools and teaching hospitals are required. A long-term program to help train various types of health service personnel should be considered. Increasing the number of health centers and mobile health units is recommended to reach remote or transitory people.

It is the writer's conviction that a considerable improvement in the rural health services can be achieved if the recommendations contained in this study are adopted.



## TABLE OF CONTENTS

|                         |     |
|-------------------------|-----|
| LIST OF TABLES. . . . . | iii |
|-------------------------|-----|

### Chapter

|     |                                                                            |    |
|-----|----------------------------------------------------------------------------|----|
| I   | INTRODUCTION . . . . .                                                     | 1  |
|     | Footnotes. . . . .                                                         | 5  |
| II  | THE PROBLEM                                                                |    |
|     | Statement of the Problem . . . . .                                         | 6  |
|     | Objectives . . . . .                                                       | 6  |
|     | Criteria . . . . .                                                         | 6  |
|     | Reasons for the Study. . . . .                                             | 6  |
|     | Facts Bearing on the Problem . . . . .                                     | 7  |
|     | Assumptions. . . . .                                                       | 7  |
|     | Definition of Terms. . . . .                                               | 8  |
|     | Research Methodology . . . . .                                             | 8  |
|     | Literature Review. . . . .                                                 | 9  |
|     | Footnotes. . . . .                                                         | 11 |
| III | GEOGRAPHY, STANDARDS OF LIVING, TRADITIONAL MEDICAL BELIEF<br>AND PRACTICE |    |
|     | Geography. . . . .                                                         | 12 |
|     | Standards of Living. . . . .                                               | 15 |
|     | Traditional Medical Beliefs and Practices. . . . .                         | 18 |
|     | Footnotes. . . . .                                                         | 19 |
| IV  | ORGANIZATION AND FUNCTIONS                                                 |    |
|     | Ministry of Public Health. . . . .                                         | 21 |
|     | Central Administration . . . . .                                           | 21 |
|     | Provincial Administration. . . . .                                         | 23 |
|     | Bangkok City Hospitals . . . . .                                           | 28 |
|     | Footnotes. . . . .                                                         | 29 |
| V   | RURAL HEALTH SERVICES                                                      |    |
|     | Rural Health Improvement Programs. . . . .                                 | 32 |
|     | Maternal and Child Health. . . . .                                         | 34 |
|     | School Health. . . . .                                                     | 35 |
|     | Provincial Hospitals . . . . .                                             | 36 |
|     | Footnotes. . . . .                                                         | 40 |
| VI  | PUBLIC HEALTH PROGRAMS AND FOREIGN AID                                     |    |
|     | Health Education Measures. . . . .                                         | 42 |
|     | Major Diseases and Disease Control . . . . .                               | 43 |
|     | Mental Health. . . . .                                                     | 52 |
|     | Medical and Public Health Research . . . . .                               | 53 |
|     | Foreign Aid - Health Programs. . . . .                                     | 53 |
|     | Footnotes. . . . .                                                         | 55 |

## Chapter

|      |                                                            |    |
|------|------------------------------------------------------------|----|
| VII  | SOCIAL WELFARE PROGRAMS                                    |    |
|      | Medical Care and Homes for the Aged. . . . .               | 57 |
|      | Home of the Disabled and Rehabilitation. . . . .           | 58 |
|      | Drug Addiction and Rehabilitation. . . . .                 | 58 |
|      | Service to Crippled Children . . . . .                     | 59 |
|      | The Thai Red Cross Society . . . . .                       | 59 |
| VIII | DISCUSSION . . . . .                                       | 61 |
|      | Footnotes. . . . .                                         | 65 |
| IX   | SUMMARY. . . . .                                           | 66 |
| X    | CONCLUSIONS AND RECOMMENDATIONS                            |    |
|      | Conclusions. . . . .                                       | 70 |
|      | Recommendations. . . . .                                   | 71 |
|      | APPENDICES                                                 |    |
|      | A - MAP OF THAILAND REGIONS. . . . .                       | 74 |
|      | B - MAP SHOWING REGION AND LOCATION OF HOSPITALS . . . . . | 75 |
|      | C - MINISTRY OF PUBLIC HEALTH. . . . .                     | 76 |
|      | BIBLIOGRAPHY . . . . .                                     | 77 |

### List of Tables

#### Table

|   |                                                                                                                              |    |
|---|------------------------------------------------------------------------------------------------------------------------------|----|
| 1 | BEDS AND STAFF OF THE DEPARTMENT OF MEDICAL SERVICES -<br>REGIONAL PROVINCIAL HOSPITALS, 1965. . . . .                       | 27 |
| 2 | BEDS AND STAFF OF SOME BANGKOK CITY HOSPITALS, 1965. . . . .                                                                 | 29 |
| 3 | MEDICAL AND HEALTH UNITS . . . . .                                                                                           | 33 |
| 4 | NUMBER OF DEATHS UNDER 28 DAYS AND UNDER 1 YEAR, AND MATERNAL<br>DEATHS AND RATES (PER 1,000 LIVEBIRTHS): 1947-1965. . . . . | 35 |
| 5 | DEPARTMENT OF MEDICAL SERVICES HOSPITALS . . . . .                                                                           | 37 |
| 6 | PRINCIPAL CAUSES OF DEATH IN THAILAND. . . . .                                                                               | 47 |

## CHAPTER I

### INTRODUCTION

Health care in Thailand is in a much more favorable position today than it ever has been before. There was a time when such epidemic diseases as cholera and malaria almost wiped out the entire population of certain affected areas during each of the various visitations.<sup>1</sup> The nation's health began to improve after the introduction of modern medicine about a century ago. The first hospital to provide western medicine was established in 1880 by missionaries. Until that time, the only practitioners of western medicine were isolated doctors employed individually by foreign companies and missions.

In 1888 the Thai government opened Siriraj Hospital in Dhonburi, and a year later King Chulalongkorn authorized the establishment of a medical school at the hospital. The health of the general population began to improve gradually after the establishment of this school. The Department of Public Health was set up by the Ministry of the Interior on November 27, 1918, to care for the health of the nation. In 1942 this department was transferred to the Ministry of Public Health, newly founded upon the recommendation of the National Health Reorganization Committee. All matters concerning the health of the nation, whether preventive or curative, were put under the control and responsibility of this ministry.

The population growth and the increase in the educational level of the people have increased the demand for more hospital care. Recognizing this need, the Thai government has developed a program for the expansion of medical services. The number of general hospitals, mental hospitals, and other hospitals has increased, and they have been equipped with all the facilities necessary for modern medical treatment. It is obvious, however, that the program which has been developed is not adequate. There is still a great need in Thailand, especially in the rural areas, for more hospitals, other medical facilities, and medical personnel. Many of the people in these rural areas are lacking in education, are superstitious, and have low standards of living which result in poor health and susceptibility to disease. Little attention has been given to the prevention of disease. In case of illness, the patient or his family may solicit the help of the local practitioner. This practitioner may be a certified practitioner of traditional medicine but he is more likely to be an unregistered nonprofessional. Both tradition and superstition have hampered medical advancement in many rural areas. For the nation to develop fully, the problem of the rural areas must be solved through a vast improvement in living conditions, the educational status, and economic conditions. Hopefully, a change in family attitudes will then take place and lead to a change in modes of behavior and in social customs. The changes will have to stress the improvement of health conditions because low health standards give rise to a loss of human energy which results in below-par

production, low income, meager education, malnutrition, and poor housing. These conditions, in turn, contribute to disease.

In countries throughout the world, governments are introducing measures for improving health, but no country has ever reached a high standard of health, even if it has possessed the necessary medical knowledge. More is required than medical knowledge. Education and social development are also very important factors. Education of the people in a community eventually creates a favorable result. Children are the most impressionable members in a community, and health education should go hand in hand with their general education. Good health contributes to the well-being, happiness, and high morale of the people and to sound national progress.

Thailand is facing an impending and serious shortage of medical manpower, particularly physicians, to care for the health needs of the nation.<sup>2</sup> The development of new medical schools and the expansion of existing ones will help solve this problem. It is realized that medical education is the core of the health and medical program of the country. However, the doctors customarily do not work alone, but as a member of a team. The surgeon, when he operates, must often be assisted by other surgeons, almost always by an anesthetist who may or may not be a physician, and usually by nurses or other individuals trained as surgical technicians. The nursing care of the patient after surgery is of great importance. In the diagnosis and treatment of the acutely ill or chronically ill patient, the physician heads a team operation in which are involved nurses, laboratory technicians,

radiologists, physical therapists, and other persons allied to medicine. The government, therefore, must increase the number of nurses and other paramedical personnel as well as physicians.

In addition, it must be remembered that the social structure in which medicine is practiced has changed profoundly during the last generation. The population is much more urbanized, people live close together, and travel for the majority is easy. On the other hand, the physician's education is long and expensive, and time spent in travel is time inefficiently used. He needs more complicated equipment and more assistance than formerly in order to practice high quality medicine; hence, there has been a great improvement in office and clinical practice.<sup>3</sup> At the same time, this improvement is increasing the cost of medical care, a situation which poses the real problem for the government and for the rural communities.

Increasing the financial support to medical education is of major concern to the people of the country as well as to the government itself. A high level of medical education cannot be attained without adequate funds for the operation of the medical schools and the maintenance of their facilities. Some of the medical schools may have to make changes in their administrative procedures in order to maintain a balanced budget. Moreover, large sums of money are needed to support the expansion required to educate additional physicians for developmental projects in the rural areas. To increase the supply of physicians, it is essential to provide funds on a matching basis and to provide scholarship aid and loans for needy medical

students. Since adequate manpower is a great national resource in any country, it seems reasonable that the government should grant more funds.

#### Footnotes

<sup>1</sup>Wendell Blanchard, Thailand (New Haven, Connecticut: Hraf Press, 1966), p. 389.

<sup>2</sup>Ibid., p. 385.

<sup>3</sup>Thomas B. Turner, Fundamentals of Medical Education (Springfield, Illinois: Charles C. Thomas, 1963), p. 7.

## CHAPTER II

### THE PROBLEM

#### Statement of the Problem

The problem is to determine the best method of providing the rural inhabitants of Thailand with a high standard of health service.

#### Objectives

The objectives of this study are: (1) to define the current method of providing health services to the rural inhabitants of Thailand; (2) to study her geography, standard of living, and traditional beliefs; and (3) to analyze the organization and operation of the Thai Ministry of Public Health, in order to improve so that a higher standard of health service for the rural inhabitants of Thailand will result.

#### Criteria

1. To increase medical education and training of health personnel, in addition to the present system, before establishing more teaching hospitals and training programs.
2. To increase the number of health centers and mobile health units in the rural health programs.
3. To provide more efficient and effective utilization of health personnel, material, facilities, equipment, and money.
4. To educate the rural inhabitants of Thailand in order for them to understand the importance of good sanitation and personal hygiene.

#### Reasons for the Study

The reason for undertaking a study of this nature is that a majority of the rural inhabitants of Thailand lack even the simplest health services.

An understanding of the reasons why this is true is required if the situation is to be improved.

#### Facts Bearing on the Problem

1. There is a lack of physicians and hospitals in the rural areas.
2. There is a lack of medical schools in Thailand for the training of physicians.
3. The health centers, mobile health units, and clinics in the rural areas are insufficient in number, are inadequately staffed, and are often inaccessible to a large portion of the rural population.
4. Currently, practicing physicians are not completely familiar with the health problems peculiar to the rural areas, nor are they motivated to enter these areas.
5. Insufficient efforts are being made to educate the rural inhabitants in a self-help program.
6. The preparation of food and the eating habits of the majority of the people are major factors in assessing the health standards of the country.
7. The solution of this problem is the responsibility of the Ministry of Public Health.

#### Assumptions

1. The needy in rural areas of Thailand are incapable of solving their health problems or of meeting their own health needs.

2. Funds alone are not the real solution to the problem.

3. Federal legislation in the area of public health will have little bearing on the problem without proper motivation on the part of the needy as well as the benefactor.

#### Definition of Terms

Ministry is a branch of government headed by a minister who is a member of the Cabinet and who is responsible to the House of Representatives for the functions of his ministry.

Department is a unit of a Ministry.

Division is a unit of a Department.

Government hospitals refer to hospitals which are under the control of the Department of Medical Services in the Ministry of Public Health.

Maternal death rates are given as the number of maternal deaths per 1,000 discharges for the same group of diseases.

Infant death rate is the number of newborn infants dying during their stay in the hospital per 1,000 live births.

Hospital beds refers to the number of beds normally in active use in the hospital. The figure does not include temporary beds held in reserve, labor or delivery room beds, or bassinets for newborn infants.

#### Research Methodology

The approach to the solution of the problem was sought (1) through a search of statistical data and of literature and (2) through observation and interviews.

A search of statistical data and of literature included articles written in both English and Thai.

The writer has worked on medical research projects for several years. During this period, observations and interviews have been made concurrent with the collecting of specimens. The interviews included rural inhabitants, health officers, and military authorities.

#### Literature Review

It is beyond the scope of this paper to attempt to list and review all of the many books and articles that have been published regarding health care in Thailand. Only a selected few will be cited. Many books and periodicals deal with topics of diseases in Thailand, medical resources, arthropods and other animals of medical importance, food and nutrition, waste disposal, traditional medical beliefs, and medical research. They usually discuss these topics in a general manner.

In a report by the Department of Health Data, "Kingdom of Thailand," the author writes:

The Department of Health under the Ministry of Public Health is expanding public health services. This department has received considerable aid from UNICEF, WHO, and the United States. Each province has a health office. An increasing number of health activities are becoming operational at these stations, but most of the rural areas need more public health workers.<sup>1</sup>

The author contends that health manpower must play an important role in providing the rural inhabitants of Thailand with adequate health services.

The Thailand Official Yearbook, 1964, has stated:

Recognizing the importance of the prevention aspect of mental health work, many child guidance clinics have been set up in Bangkok since 1953 to deal with the emotional and behavior problems among the younger generations. However, owing to lack of fully-qualified personnel, this valuable service has to be limited to children under 14 years of age.<sup>2</sup>

This statement shows that the health manpower shortage can be found in various fields of medicine. Such a shortage results in limitations in the health care delivery system.

In the Area Handbook for Thailand, Harvey H. Smith writes:

Despite considerable advances much remains to be done in the field of public health and sanitation. Many parts of the country, especially in the Northeast, suffer from chronic water shortages, and sewage systems are inadequate in most areas. Diseases caused by poor sanitation are one of the leading causes of illness and death. In addition, because more than half of the country's hospitals and most of its Western-trained physicians are found in or around Bangkok, the mass of the people lack modern medical care and continue

to rely on traditional remedies and on practitioners of Chinese medicines.<sup>3</sup>

This statement reflects the fact that the main problems of health services are insufficiency of staff and the concentration in Bangkok and provincial capitals of such facilities as are available.

A review of the literature confirms the view of the writer that the greatest problem concerning health services in the rural areas of Thailand is the health manpower shortage. Although the government is aware of the many problems facing the rural areas (i.e., lack of education and lack of facilities), such problems cannot be overcome without an adequate number of qualified health personnel to implement the health programs there.

#### Footnotes

<sup>1</sup>Department of Health Data, Report of the Department, Kingdom of Thailand (Washington, D. C.: Government Printing Office, 1966), p. 34.

<sup>2</sup>Office of the Prime Minister, Thailand Official Yearbook, 1964 (Bangkok: Government Printing Office, 1965), p. 223.

<sup>3</sup>Harvey H. Smith, et al., Area Handbook for Thailand (Washington, D. C.: U. S. Government Printing Office, 1968), p. 134.

### CHAPTER III

#### GEOGRAPHY, STANDARDS OF LIVING, TRADITIONAL MEDICAL BELIEF AND PRACTICE

##### Geography

Thailand, one of the Southeast Asian countries, is situated on the Indochinese peninsula. This country is bounded on the north by China and Laos, on the west by Burma, on the east by Cambodia and Vietnam, and on the south by Malaysia. Thailand is situated between the parallels of 5 and 21 degrees north latitude. It covers an area of approximately 518,000 square kilometers. The topography of Thailand is characterized by (1) flat alluvial plains intersected by winding rivers and irrigation canals which are flooded during the rainy season, (2) high mountains which are in the southeastward continuation of the Himalayan range, (3) maritime features such as irregular coast lines, sandy beaches and numerous islands, and (4) a certain amount of undulating country. On the whole its climate is tropical and has three well-defined seasons - hot, rainy, and cool. The hot season is from March to May; the rainy season is from June to October when the southwest monsoon blows and almost daily showers lower the temperature; and the cool season is from November to February. The highest and lowest variations in temperature range from 62° F. in December to 97° F. in April.

The northern mountainous area consists of a series of parallel and longitudinal rugged mountains in continuation of the Himalayan range, which

runs down through the east of Assam in India, Yunnan Province of China, and the Shan State of Burma. This great arc of ranges continues further south through the peninsula of Thailand and Malaysia. Between the ridges of these mountains are relatively flat basins through which flow four major tributaries of the Chao Phya River. The alluvial soils of these basins are fertile for rice cultivation and for growing vegetables, tobacco, and various kinds of fruit trees.

The central plain of Thailand may be divided into two distinct physiographic sub-provinces, the Chao Phya Delta and the northern rolling plain. The Chao Phya Delta is traversed by two major rivers, the Chao Phya River and the Tha Chin River. The flat land of this delta is generally low and is usually flooded by rain water, making it very useful for rice growing. The higher grounds close to the west and east sides of the delta must be aided by irrigation. This delta is the largest and most fertile plain of the country.

The Khorat Plateau consists of a two-sided fault and a tilt rather than a uniform uplift of the strata of sedimentary rocks. The western tilt causes the ranges of Dong Phrayayen and Petchabun to rise longitudinally with their escarpments facing the central plain on the west. The elevation of the tilted rim of the plateau on this side varies from 430 to 660 feet above mean sea level, while the flat top of Dong Phrayayen is generally between 2,640 to 4,290 feet. The southern tilt separates the plain of Cambodia from the plateau surface. Thus, the two levels of land are traditionally called Upper Thailand and Lower Cambodia. The major part of the plateau consists of sandstone which is the parent material of the sandy soil. The underground

water can be made available in many places by digging wells, but the water obtained is either salty or hard and therefore is not useful for domestic purposes. As a result of the government's program in solving the water problems of the northeast, there is an increasing number of wells with fresh water.

The southeast region is flanked on the east by a range of hills which forms part of the frontier between Cambodia and Thailand. Because the mountains in this region are close to the sea, the coast line is greatly indented and fringed with rocky islands. The area has been much dissected by numerous streams, all flowing in a southerly direction. Along the coast these streams have built up small alluvial basins and deltas which are utilized for rice cultivation. The higher grounds and the well drained slopes are occupied by plantations -- tapioca, rubber, sugar cane, and pineapple -- as well as by numerous varieties of orchards.

The southern portion, Peninsula Thailand, commences from the Isthmus of Kra and extends down to the Malaysian border. It faces the sea on both sides, the South China Sea on the east and the Andaman Sea on the west. The western coast line is greatly indented because many hills come close to the shore. The streams and rivers are generally short and flow down to the seas. Many of the rivers in this region have built-up delta lands capable of use for rice cultivation. East of Pattalung and north of Songkhla lies a large lake, Thalesap Songkhla, bordered by a big plain which produces a large quantity of rice for the south.

### Standards of Living

In Thailand the study of health problems according to their causes and contributing factors must be conducted concurrently with the study of all other major community problems. The causes of health problems are reasonably easy to identify. Pneumonia and influenza are the two major respiratory diseases. Related factors include lack of health, standard of living, poor nutrition, lack of knowledge, inadequate housing, inadequate medical care, and low immunization levels. Especially in Asia, it is necessary to consider the background of extreme poverty and a teeming population.<sup>1</sup> Identification of these factors enables the health officers to plan activities to overcome them.

There are two different standards of living in Thailand, urban and rural. Approximately 90 per cent of the population lives in rural areas.<sup>2</sup> Growing industrialization and the Western influence on recreation and the pace of living in general have tended to sharpen the contrast between rural and urban conditions. By Southeast Asian standards, the level of welfare and the standard of living in Thailand is, in general, high.<sup>3</sup> Nearly everyone is adequately fed, clothed, and housed. The adequate diet of the rural areas is an indication of the country's generally ample standard of living, except in parts of the Northeast. Rice remains the basis of all meals in all classes but with increased prosperity more foods are included in the diet, particularly eggs, meat, fish, vegetables, and fruit.<sup>4</sup> Eating habits vary according to personal requirements and tastes. For instance, the peasant usually eats two meals a day and has frequent snacks. The meal hours tend to be irregular and the family eats

when it gets hungry. However, during the planting and harvesting seasons, the work demands that breakfast be eaten at dawn and supper at dark.

Most rural Thais are remarkably indifferent about their housing. The climate is so mild that elaborate shelter is not required and heating is necessary only in certain sections of the mountains in the north. Only in the last twenty years has a housing problem developed. Building materials have become scarce and expensive. Teak is beyond the reach of all except the most wealthy; other hard woods have acquired export value; and even bamboo and palm matting have greatly increased in price. Rural dwellings vary from the ground-level huts of the itinerants to the elaborately carved teak houses of the wealthy. Regardless of the material used, the style of the house is the same: one to three or more small plain bedrooms and a large central room. Cooking is usually done in the central room or in a space partitioned off as a kitchen; more prosperous families have kitchens built away from the main dwelling.

The kind of food eaten in urban Thailand differs only slightly from that eaten in the countryside. In Bangkok and other big cities more vegetables and meat products are consumed and canned goods are in demand. Among the old elite, cooking continues to be a traditional art and women take pride in their skill in preparing sauces, curries, condiments, sweets, and desserts. Most upperclass urban families have adopted the Western pattern of eating three meals a day. Rice is likely to remain the staple of the Thai people and in basic forms the meal is similar in all parts of the country. The people in the rural areas eat two meals a day, more or

less alike, including fish, meat, and vegetables. Sauces are used to flavor the rice and make it more palatable. The average Thai daily diet is about 1,600 calories. Although this figure has been shown to be somewhat under the standard estimate for Eastern people, the diet contains more proteins, vitamins and minerals than that of neighboring nations. The processing method is an important factor in the nutritional value of rice. In the cities only machine-milled rice is sold, but in the rural areas the peasants mill their own rice which retains a larger per cent of the nutritious bran covering of the grain. In certain areas, for example in Chiangmai, the people prefer a highly refined rice, a preference which in 1950-1951 resulted in a severe Beriberi outbreak. The average method of preparing rice for the table also sacrifices essential nutrients. The most important factors involved in solving this nutritional problem are education and the application of educational techniques in changing the patterns of eating.

Housing standards in the capital show great extremes of squalor and luxury. Thousands of families live in the restricted quarters of houseboats. The poorest people rent space in structures built from bamboo, scrap lumber, or packing boxes. For the middle-income family there is virtually no housing problem, although the quality of housing varies considerably.

The living standards of the Thai people are rather low compared with Western countries. Considerable economic progress has been achieved, however, particularly since the end of World War II. The growth of the

Thai economy in the postwar period is indicated by the increase in the gross national product which amounted to 28.2 billion baht in 1951, 40.9 billion in 1956, 63.1 billion in 1962, and 65.8 billion in 1963.<sup>5</sup> Consumption levels among the Thai are relatively high by Asian standards. The rise of the cost-of-living index has been relatively low -- 5 per cent since 1961. However, the prices of rice, pork, beef, and many essential nonfood items have created hardships for persons in lower-income brackets, especially in the big cities. A considerable portion of the household expenditures in 1965 was spent for food. Between 1957 and 1965 private expenditures on health care, beverages, tobacco, fuel, furniture, and household equipment showed an increase of 49 per cent.

#### Traditional Medical Beliefs and Practices

Many of the Thai people do not seem to have a single, consistent theory about the cause of disease. Many common afflictions are recognized and easily diagnosed as being of physical origin. Others are thought to be the work of evil spirits which enter the body and cause a disturbance or begin to devour the victim. Traditional methods of therapy include many favored food and herbal mixtures which may be known generally or may be the specialty of a single family. Medicines of the Chinese pharmacist or drug peddler who occasionally comes to the village are also popular. In cases of serious illness the patient or his family may decide to try propitiation of the house spirit or to solicit the help of the local practitioner. The latter may be a certified practitioner of traditional medicine, but he is more likely to be unregistered and a nonprofessional.

Childbirth usually takes place in the home and is handled by midwives employing traditional methods. If no midwife is called, the pregnant woman's mother or some neighbors will aid in the delivery.

After the birth, the mother and baby stay indoors for one to two months and the mother is encouraged to lie near an open fire. In recent years this treatment has been modified by placing the woman near a small metal box with burning fuel inside or by placing a hot water bottle on the mother's abdomen.

Traditional medical beliefs and practices in general do not pose any serious problem to the introduction of modern medicine. Rural inhabitants are willing to consider and to accept new ideas if such ideas prove to be obviously useful. In recent years the rural people have gone to the hospital or to private clinics when the local practitioner has been unsuccessful. They are also willing to accept the immunizations provided by the government against epidemic disease. The psychological value of traditional ideas and practices, the importance of careful selection of suitable health personnel, and the necessity for encouraging people to turn to modern medicine are among the factors that must be kept in mind in attempting to introduce modern medical techniques.

#### Footnotes

<sup>1</sup>Donald Rene Thompson, Major Health Problems in Asia (Los Angeles: University of California Press, 1961), p. 142.

<sup>2</sup>Smith, p. 61.

<sup>3</sup>Ibid., p. 133.

<sup>4</sup>Vichai Vongchai, "Calorigenic Nutrients and Some Minerals in 117 Northern Thai's Dishes," Journal of Medical Association of Thailand, XLI (August, 1966), 595.

<sup>5</sup>National Income Office, Office of the National Economic Development Board (Bangkok: National Income Office, 1965), p. 4.

## CHAPTER IV

### ORGANIZATION AND FUNCTIONS

#### Ministry of Public Health

The Department of Public Health was set up in the Ministry of Interior on November 27, 1918, to care for the health of the nation. This auspicious date marked the inception of organized public health work in the country and has been appropriately designated as the annual Public Health Day. In 1942 the department was transferred to the newly founded Ministry of Public Health. All matters concerning the health of the nation, whether preventive or curative, were thus put under the control and responsibility of this ministry. One of the most important duties of the government is to consider the sickness of the rural inhabitants for whom there are inadequate medical facilities and health manpower. With generous assistance from specialized agencies of the United Nations and several countries, the Ministry of Public Health has been able to forge ahead in combating and preventing diseases.

#### Central Administration

The task of the Ministry of Public Health is distributed among its four major departments: (1) The Office of the Under-Secretary of State for Public Health; (2) the Department of Health; (3) the Department of Medical Services; and (4) the Department of Medical Sciences (see Appendix C). Under each of these departments are several divisions through which

the great load of work is further channeled. In addition, directly under the Ministry of Public Health are the Committee for Medical Research, the Government Pharmaceutical Laboratories Committee, the National Nutrition Committee, the School Health Committee, and the Health Coordination Committee.<sup>1</sup>

#### The Office of the Under-Secretary of State

In addition to its administrative function and correlation of the work of the various departments, the office of the Under-Secretary of State exercises its duties through the Division of Medical Registration, International Health, Food and Drug Control, and Nursing, as well as through the Medical Council, the Committee for the Control of Sale of Drugs, the Committee for Food Quality Control, the Committee for T. B. Control, and the Filariasis Control Board. The latest additions to this Office have been the Division of Malaria Eradication and the Division of Vital Statistics.

#### The Department of Health

This department deals with the prevention and control of diseases throughout the nation. There are 17 divisions in the central administration, with 71 health offices and over 1,700 health and midwifery centers in the provincial administration. The department also maintains hospitals for tuberculosis, leprosy, and infectious diseases.

#### The Department of Medical Services

This department operates 86 general and 9 mental hospitals, 83 of which are located in the provinces. This department will soon undertake

to expand facilities in existing regional and district hospitals commensurate with the annual budget allotment. A unique feature of this department is the Buddhist Priests' Hospital in Bangkok. The work of this hospital is not confined to the institution alone; it extends outward to many Buddhist monasteries where it advises and assists in matters of health and sanitation.

#### The Department of Medical Sciences

The main objectives of this department are to promote research and to introduce modern diagnostic procedures in the treatment and prevention of diseases. Thus, it functions as the public health laboratory for the ministry and also for the medical profession in general. The department functions through its Divisions of Medical Research, Diagnostic Laboratories, Drug Analysis, Food and Beverage Analysis, and Medical Depot.<sup>2</sup> The main objectives of the laboratory service are to promote medical research, to serve as a national food and drug testing laboratory, and to assist medical and health officers in the diagnosis of diseases.

#### Provincial Administration

The provincial health offices, through the network of peripheral health units located in up-country villages, provide basic health services for people in those rural communities. A provincial health officer is assigned to each province to take charge of preventive health measures. He is assisted and guided by the appropriate divisions in the Department of Health, but no measures can be taken in his province without the approval of the province governor, to whom he is directly answerable.

Curative measures are mainly the responsibility of the Department of Medical Services' provincial hospitals. The directors of these hospitals are responsible to the provincial governor.

The policy of the Ministry of Public Health is to correlate the activities within its provincial operations. In addition to working for the prevention of diseases, the rural health units also offer curative services.

Several divisions of the Department of Health operate mobile units or have their headquarters in the provinces in order to carry out certain specialized health programs.<sup>3</sup> This is the case with the Divisions of Malaria Eradication, Venereal Diseases and Yaws Control, Tuberculosis Control, Leprosy Control, Maternal and Child Health, and School Health. Three plague control units are also maintained by the Department of Health at strategic points.

At present there are two regional public health laboratories, one in the south and the other in the north. The Department of Medical Sciences is determined to establish at least one public health laboratory in each region of the country.

Approximately 90 per cent (27.9 million) of the Thai people reside in small, long-established villages in the rural areas. Of the remainder, 5 per cent live in Bangkok and 5 percent in cities scattered throughout the country. The towns located in the provincial areas are usually of small size; only a very few have a population in excess of 25,000. Since the population density is low in the provincial areas and

the villages are widely scattered, the provincial hospitals are usually established at transportation centers, often the largest towns of the area which they serve. However, many of the villages are located in areas remote from good roads and transportation services. The people of these areas, finding it difficult to reach the hospitals, usually come in only for serious emergencies. The net result is that the hospital service region is restricted mainly to areas along the roads and to areas where good transportation is available. Thus, the majority of rural inhabitants do not have access to hospital care.

The 83 provincial hospitals are of moderate size, ranging from 25 to 386 beds and having an average of 110 beds per hospital.<sup>4</sup> For administrative purposes they are placed into nine geographic regions (see Appendix B).

Region 1 lies to the north of Bangkok in the great central plain of Thailand. The topography is flat, and the country is mainly covered with rice paddy fields and other types of agricultural crops. The population density is rather high compared with that of the rest of the country, running between ten and thirty or more persons per square kilometer. Roads are good and travel is easy. This region is the heartland of the country and is a rich food-producing area.

Region 2 is in the southeast, borders the east coast of the Gulf of Thailand, and extends northward to the Khorat Plateau. The area is quite hilly and heavily forested. Good roads are found mainly along the gulf shore and along the edge of the Khorat Plateau. The bulk of the population

resides along either the gulf coast or near the main and secondary roads. Malaria is especially prevalent in this region.<sup>5</sup>

Regions 3 and 4 constitute the northeast area of the country. The region starts on the Khorat Plateau and is bounded on the east by the Mekong River. Rainfall is scarce and the region frequently suffers from drought. The area is economically depressed and the standard of living is not as high as in other parts of the country. The population is concentrated along the two main rivers of the area.

Region 5 is in the northern part of Thailand and is largely mountainous and heavily forested. Agriculture takes place in the alluvial soil of the valleys. The climate is somewhat cooler than in the southern areas of the country. The population is concentrated along the rivers and roads.

Region 6 is located mainly in the northern end of the central plain of Thailand from whence it slopes upward to a rugged, heavily forested mountain range on the western border. The population is concentrated largely in the center of the region along the roads and rivers, with an average density in the heavily populated areas of ten to thirty or more persons per square kilometer.

Region 7 is bordered on the west by a range of mountains and is heavily wooded. The area slopes from the mountains down to the great central plain near Bangkok and continues along the southern peninsula and the west coast of the Gulf of Thailand. The population density is comparatively low and is mainly concentrated along the sea coast and the main roads.

Source: Department of Medical Services, Report of the Department, Statistical Report (Bangkok: Government Printing Office, 1965), p. 4.

Regions 8 and 9 constitute the southern part of Thailand.

The area is bordered on the east by the Gulf of Thailand, on the south by Malaysia, and on the west by the Andaman Sea. The area is heavily forested, is mostly jungle, and is thinly populated except along the sea-coasts. There are large areas containing rubber plantations.

The figures below give the over-all picture of beds and staff of the Department of Medical Services regional provincial hospitals.

TABLE 1

BEDS AND STAFF OF THE DEPARTMENT OF MEDICAL SERVICES  
REGIONAL PROVINCIAL HOSPITALS, 1965

| Region   | Number<br>of<br>Hospitals | Active<br>Beds | Staff   |         |       |       |
|----------|---------------------------|----------------|---------|---------|-------|-------|
|          |                           |                | Medical | Nursing | Other | Total |
| Region 1 | 12                        | 1,244          | 87      | 484     | 141   | 712   |
| Region 2 | 7                         | 1,039          | 70      | 366     | 154   | 590   |
| Region 3 | 6                         | 1,086          | 78      | 334     | 70    | 482   |
| Region 4 | 10                        | 1,151          | 81      | 489     | 233   | 803   |
| Region 5 | 9                         | 933            | 63      | 476     | 79    | 618   |
| Region 6 | 10                        | 1,098          | 98      | 368     | 105   | 571   |
| Region 7 | 11                        | 1,139          | 82      | 499     | 138   | 719   |
| Region 8 | 8                         | 496            | 43      | 243     | 72    | 358   |
| Region 9 | 10                        | 940            | 70      | 328     | 101   | 499   |
| Total    | 83                        | 9,126          | 672     | 3,587   | 1,093 | 5,352 |

Source: Department of Medical Services, Report of the Department, Statistical Report (Bangkok: Government Printing Office, 1965), p. 4.

### Bangkok City Hospitals

The city of Bangkok has a population of about three million people and is by far the largest city in Thailand. The city of Bangkok includes Bangkok proper on the left bank of the Chao Phya River and Thonburi on the right bank of the river. The city is extensive in area and largely decentralized with numerous shopping and business districts scattered throughout the city. Basically, the city may be characterized as a government and communications center. It is the major port of entry and all railroads and highways converge upon Bangkok as a transportation hub. In contrast to the provincial hospitals which serve a rural population, the Bangkok hospitals serve a largely metropolitan population.

The following table gives a brief summary of the beds and staff of a portion of the Bangkok city hospitals so that the city hospitals may be compared with the provincial hospitals.

<sup>1</sup>Ministry of Public Health, *Public Health in Thailand* (Bangkok: Government Printing Office, 1953), p. 15.

<sup>2</sup>Salut Varnabharat, "Hospital Administration," *Medical News*, IV (December, 1953), 540.

<sup>3</sup>Ministry of Public Health, p. 17.

TABLE 2

## BEDS AND STAFF OF SOME BANGKOK CITY HOSPITALS, 1965

| Name<br>of<br>Hospital        | Active<br>Beds | Staff   |         |       |       |
|-------------------------------|----------------|---------|---------|-------|-------|
|                               |                | Medical | Nursing | Other | Total |
| Women's )<br>)<br>Children's) | 962            | 125     | 438     | 714   | 1,277 |
| Priests'                      | 212            | 14      | 111     | 105   | 230   |
| Lerd-Sin                      | 325            | 39      | 161     | 202   | 402   |
| Prasat                        | 190            | 19      | 51      | 174   | 244   |
| Police                        | 207            | 58      | 122     | 54    | 234   |
| Bangkok Christian             | 153            | 20      | 86      | 47    | 153   |
| Siriraj                       | 1,425          | 391     | 832     | 853   | 2,076 |
| Chulalongkorn                 | 1,163          | 254     | 451     | 274   | 979   |
| Total                         | 4,637          | 920     | 2,252   | 2,423 | 5,595 |

Source: Department of Medical Services, Report of the Department, Statistical Report (Bangkok: Government Printing Office, 1965), p. 6.

Footnotes

<sup>1</sup>Ministry of Public Health, Public Health in Thailand (Bangkok: Government Printing Office, 1963), p. 15.

<sup>2</sup>Bulsuk Vatanabhasuk, "Hospital Administration," Medical News, IV (December, 1955), 540.

<sup>3</sup>Ministry of Public Health, p. 17.

<sup>4</sup>Department of Medical Services, Report of the Department, Statistical Report (Bangkok: Government Printing Office, 1965), p. 3.

<sup>5</sup>Ibid., p. 162.

The people of the province are not only lacking in health and medical services. Communities throughout the province are also provided in the rural parts of the province, especially in the mountainous region. Thus, it is the intention of the province to strengthen and expand the rural health services throughout the province. A long-term objective of the Department of Health is to provide the provincial health services for more than 25 million people in the province.<sup>5</sup> This objective can best be achieved by expanding the number of various categories of health workers and by spreading health services into the rural areas. To meet this objective the Department of Health, assisted by the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), and the International Commission on Health (ICM), has launched various programs, such as health workers, health services extension programs, and health workers training programs.<sup>6</sup>

Rural health services are provided by the province by the provincial health department through the health workers stationed in the villages. The provincial health department is charged with all health activities in the province, and has many health workers and health service offices under its supervision (see Appendix C). The provincial health officer,

## CHAPTER V

### RURAL HEALTH SERVICES

The people in the provinces generally lack health and medical services. Communicable diseases and malnutrition are more prevalent in the rural parts of the country, especially in the northeast region. Thus, it is the intention of the government to strengthen and expand the rural health services throughout the country. A long-term objective of the Department of Health is to provide and improve rural health services for more than 29 million people living in these areas.<sup>1</sup> This objective may best be achieved by strengthening the training of various categories of health workers and by gradually extending health centers into the rural areas. To meet this objective the Department of Health, assisted by the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), and the International Cooperation Administration (ICA), has launched various programs, such as rural health center programs, health services expansion programs, and village health and sanitation programs.<sup>2</sup>

Rural health services are provided to the people by the provincial health department through its health centers located in the villages. The provincial health department is responsible for all health activities in the provinces, and has rural health centers and district health offices under its supervision (see Appendix C). The provincial health officer,

working in close coordination with the chiefs of other provincial governmental agencies, is directly answerable to the provincial governor.<sup>3</sup> The rural health units are of three major types.

1. The Rural Health Center. The basic unit of rural health service is the rural health center. There is a minimum indoor accommodation of ten to twenty-five beds for emergencies. This unit is the nerve center of the whole system and has one doctor, two sanitarians, one nurse-midwife, and one auxiliary midwife. It provides integrated curative and preventive personal health care to the rural inhabitants: included are health education, environmental health services, maternal and child health services, control of communicable diseases, a demonstration area of sanitary conveniences suitable for adoption in rural areas, and a system of school health services. The medical care is provided in cooperation with the provincial hospital.

2. The Rural Health Sub-Center. Each sub-center consists of one sanitarian and one auxiliary midwife. The provincial health officer is in charge and the services are limited to maternal and child welfare, medical care of minor ailments, and environmental sanitation. In some of these centers medical aid is available to outpatients through a visiting physician.

3. The Midwifery Center. The main function of this center is to provide maternal and child care. It is manned by either a nurse or an auxiliary midwife.

#### Rural Health Improvement Programs

In 1953 a program for the improvement of health center services was started with the assistance of UNICEF. In 1961 this program was integrated with the one for national economic development; the integrated

program, known as the Rural Health Center and Health Services Expansion Program, was carried out from 1961-1967. In 1965 there were 208 health centers, 854 health sub-centers, and 1,265 midwifery centers (see Table 3). This program provided increases in the number of health centers, in medical supplies and equipment, and in transportation for field work. It also assisted in the training of such types of health service personnel as medical health officers, public health nurses, sanitarians, and midwives. The achievements of the program can be measured by the increase in the number of rural health units and by the improvement in rural health services.<sup>4</sup> (See Table 3.)

TABLE 3  
MEDICAL AND HEALTH UNITS

| Unit                  | 1961 | 1962 | 1963  | 1964  | 1965  |
|-----------------------|------|------|-------|-------|-------|
| Health Centers        | 157  | 159  | 169   | 175   | 208   |
| Health Sub-centers    | 689  | 704  | 723   | 765   | 854   |
| Midwifery Centers     | 821  | 959  | 1,078 | 1,161 | 1,265 |
| Other Health Services | 179  | 194  | 225   | 236   | 287   |
| Static Units          | 129  | 139  | 158   | 167   | 217   |
| Mobile Units          | 50   | 55   | 67    | 69    | 70    |

Source: Division of Vital Statistics, Yearbook of Public Health Statistics, 1965 (Bangkok: Government Printing Office, 1966), p. 122.

The work of the Village Health and Sanitation Project began in 1960; its primary objective is to control disease by improving the sanitary and social standards of living of the rural population. The program was first implemented in the northeast region. In 1961 it was extended to the south and, in 1962, to the north. Reports from health workers in the field indicate that out of a total of 5,495 northern villages, 219 were involved in the improvement program by the end of 1962. At present the total number of villages taking part in the program is 1,700. The list of achievements includes the provision of 2,392 sanitary wells, the installation of 40,405 sanitary outdoor toilets, and the maintenance of cleanliness in and around 74,000 houses.

#### Maternal and Child Health

Estimates of the infant mortality rate for the whole country fifty years ago ran as high as 300 per 1,000 live births. As a result of the improvement in public health activities the rate of 99.8 in 1941 was reduced to 50.8 in 1961 and to 31.2 in 1965.<sup>5</sup> There has also been a steady decline in the maternal death rate and in the stillbirth rate. The former was reduced from 7.1 in 1941 to 3.1 in 1965; the latter was reduced from 4.0 to 1.7 for the same years (see Table 4). The policy of the government is to provide more skilled persons to render the necessary services in protecting and promoting the health of mothers and children in the remote areas. Up to the present time, more than 2,000 midwives have been trained; of these, 1,765 are working either in midwifery centers or in health centers in the various provinces. With regard to nurses, at least one is required for every health center. In order to meet this requirement the government grants four-year scholarships to candidates in the field of nursing who are

residents of the various provinces. Following graduation the nurses are sent back to serve the people in their own provinces.

TABLE 4

NUMBER OF DEATHS UNDER 28 DAYS AND UNDER 1 YEAR,  
AND MATERNAL DEATHS AND RATES (PER 1,000 LIVEBIRTHS): 1947-1965

| Year | Under 28 Days |      | Under 1 Year |      | Maternal Deaths |      |
|------|---------------|------|--------------|------|-----------------|------|
|      | Number        | Rate | Number       | Rate | Number          | Rate |
| 1947 | -             | -    | 32,989       | 79.8 | 3,093           | 7.5  |
| 1948 | -             | -    | 29,000       | 68.1 | 2,952           | 6.9  |
| 1949 | -             | -    | 33,271       | 65.9 | 3,576           | 7.1  |
| 1950 | 10,519        | 20.0 | 32,742       | 62.4 | 3,481           | 6.6  |
| 1951 | 10,540        | 19.0 | 36,100       | 65.3 | 3,667           | 6.6  |
| 1952 | 9,673         | 16.9 | 36,034       | 62.8 | 3,662           | 6.4  |
| 1953 | 10,365        | 17.1 | 39,397       | 64.9 | 3,632           | 6.0  |
| 1954 | 12,151        | 17.8 | 43,275       | 63.5 | 3,626           | 5.3  |
| 1955 | 11,804        | 17.0 | 38,998       | 56.1 | 3,807           | 5.5  |
| 1956 | 12,794        | 16.5 | 42,747       | 55.2 | 4,152           | 5.4  |
| 1957 | 13,225        | 17.0 | 47,963       | 61.7 | 3,839           | 4.9  |
| 1958 | 11,334        | 14.3 | 42,779       | 54.1 | 3,756           | 4.8  |
| 1959 | 11,284        | 13.1 | 40,587       | 47.1 | 3,964           | 4.6  |
| 1960 | 11,829        | 12.9 | 44,793       | 49.0 | 3,855           | 4.2  |
| 1961 | 11,084        | 12.1 | 46,575       | 50.8 | 3,646           | 4.0  |
| 1962 | 11,463        | 11.8 | 43,489       | 44.7 | 3,644           | 3.7  |
| 1963 | 10,851        | 10.6 | 38,696       | 37.9 | 3,674           | 3.6  |
| 1964 | 10,920        | 9.8  | 42,358       | 37.8 | 3,553           | 3.2  |
| 1965 | 10,024        | 9.0  | 34,924       | 31.2 | 3,483           | 3.1  |

Source: Division of Vital Statistics, Yearbook of Public Health Statistics, 1965 (Bangkok: Government Printing Office, 1966), p. 13.

### School Health

Two main objectives have been established in the school health program. The first is to raise the health level of the school children; the second is to deal effectively with the child who shows an abnormality. School health activities carried on by the School Health Division are confined mainly to the cities of Bangkok and of a few provinces. In

addition, the health of the children in these municipal areas is also being taken care of by the municipalities. With regard to the services provided to children, only school entrants and referrals are scheduled for medical examinations. A continuous immunization program is carried out in the school; the students are immunized against cholera, typhoid, smallpox, and other communicable diseases. An attempt has been made to expand these school health services into the provinces. School health units have recently been set up and are assigned to several provinces for varying periods of time. Each unit consists of a school medical officer, a dental hygienist, one to three nurses, a driver, and a workman.

#### Provincial Hospitals

In 1942 there were only twenty-five hospitals maintained in the provinces by the Ministry of Public Health. Of these, there were fifteen general hospitals, four mental hospitals, five leper hospitals, and one tuberculosis hospital. Only a few hospitals were capable of altering their methods of operation in order to care for the cases of epidemic diseases which occurred from time to time. Most of the hospitals were financed by government subsidies; the rest were maintained by private funds. Although the need for more hospitals was acutely felt, it was not possible for the Ministry of Public Health to add any new hospitals until a few years later. Because Thailand was under the crucial pressure of World War II a plan for the expansion of medical care services was delayed. In 1947 such a plan for expansion was initiated and, by 1953, a total of twenty-six new

hospitals were in operation and eight more were under construction.<sup>6</sup> The medical services at that time were still inadequate for the rural population; only 3,000 hospital beds were available for approximately 20 million rural inhabitants. With the objective of establishing at least one general hospital in each province, the Department of Medical Services has, during the past 9 years, endeavored to add 47 more provincial hospitals. At present the department maintains in various parts of the country a total of 86 general hospitals, 9 psychiatric hospitals, and 1 narcotic hospital. Worth mentioning is the fact that Thailand is now involved in a 10-year program for constructing more hospitals, particularly in the rural areas. Simultaneously, every effort is being made to expand and strengthen the services of the existing hospitals, the aim being to provide rural inhabitants with the best medical care facilities available.

There is a combined total of 83 general hospitals, with a total of 9,126 beds, in the 69 provinces (see Table 5).

TABLE 5

## DEPARTMENT OF MEDICAL SERVICES HOSPITALS

| Type of Hospital          | Number | Beds*  |
|---------------------------|--------|--------|
| General Medical Hospitals |        |        |
| Bangkok City Hospitals    | 3      | 1,499  |
| Provincial Hospitals      | 83     | 9,126  |
| Psychiatric Hospitals     | 9      | 5,685  |
| Narcotic Hospitals        | 1      | 475    |
| Total                     | 96     | 16,785 |

\*Excluding temporary beds held in reserve, labor and delivery room beds and cribs for newborn infants.

Source: Department of Medical Services, Report of the Department, Statistical Report (Bangkok: Government Printing Office, 1965), p. 2.

Three new provincial hospitals are now under construction and additional medical facilities, including new wards and modern equipment, are being installed in the existing hospitals under the provincial hospital improvement program. Most of the provincial hospitals are equipped with the facilities necessary for modern medical treatment, including operating theaters, x-ray equipment, diagnostic laboratories and blood banks. Some provincial hospitals have a basic nursing school and a school for nurses' aides. In 1962, 1,831,647 outpatients and 344,763 inpatients were registered in the provincial hospitals.

In addition to the hospitals under the Ministry of Public Health there are 25 general hospitals operated by medical schools, other governmental agencies, and municipalities. The largest ones are Siriraj Hospital (1,400 beds) and Chulalongkorn Hospital (960 beds). The outpatient registration in these two hospitals alone averages about 600,000 per year; the inpatient registration averages about 60,000 per year. Governmental medical services are supplemented by 51 private hospitals and 21 public hospitals which are operated by charitable organizations and religious bodies. In the rural areas in 1965 there were 208 health centers which had 10 to 25 beds available for patients.<sup>7</sup> An estimate made by pooling these centers together shows that there is one hospital bed for every 1,500 persons.

The improvements in the health care of the nation have resulted from the increased efficiency of physicians working with modern diagnostic and therapeutic facilities. It is obvious that the existing facilities

in Thai hospitals are insufficient to cope with the increasing number of patients. This facility insufficiency is one of the chief problems of the nation. Moreover, there is still a shortage of health manpower because a large number of medical personnel, especially physicians, go abroad following graduation. At present the number of registered health professionals includes 4,983 physicians, 635 dental surgeons, and 2,208 pharmacists. In 1962 there were only 4,929 graduate nurses, 5,821 nurse-midwives, and 970 midwives.<sup>8</sup> By 1967 these figures had increased to 7,751 nurses, 8,476 nurse-midwives, and 4,714 midwives. Government medical services generally are administered to the population by full-time salaried staffs and are provided free of charge to the indigent sick. For those who can afford to pay, nominal fees calculated to cover just the actual expenses are charged for drugs, special laboratory examinations, and personal medical services. Special wards are available in all general hospitals for those who are willing to pay the hospital fees covering surgery, drugs, meals, room, and other expenses. In addition to the annual budget allotment most governmental hospitals are financially supplemented by private donations.

Almost all of the drugs and pharmaceuticals used in Thailand are imported. As a result, in time of war, civilians may experience an acute shortage of medical supplies.<sup>9</sup>

In summary, the main problems of Thai hospital services are the insufficiency of staff and equipment and the concentration in Bangkok and provincial capitals of such facilities as are available.<sup>10</sup>

Footnotes

<sup>1</sup>Thailand Official Yearbook, 1964, p. 234.

<sup>2</sup>Ibid., p. 220.

<sup>3</sup>Ibid., p. 79.

<sup>4</sup>Ministry of Public Health, p. 33.

<sup>5</sup>Division of Vital Statistics. Yearbook of Public Health Statistics, 1965 (Bangkok: Government Printing Office, 1966), p. 13.

<sup>6</sup>Ministry of Public Health, p. 33.

<sup>7</sup>Division of Vital Statistics, p. 122.

<sup>8</sup>Linnea M. Brown, Effective Preventive Medicine for U. S. Forces During Limited Warfare in Thailand, Report to the Department of the Army, Washington, D.C., July, 1962 (Maryland: Research Analysis Corporation, 1962), p. 153.

<sup>9</sup>Ibid., p. 13.

<sup>10</sup>Blanchard, p. 385.

## CHAPTER VI

### PUBLIC HEALTH PROGRAMS AND FOREIGN AID

Despite considerable advance, much remains to be done in the fields of public health and sanitation. Many parts of the country, especially in the northeast, have a prevalence of waterborne and filth-borne diseases. In 1965, 40 per cent of Thailand's deaths were caused by poor sanitation and contaminated water supplies. The rural inhabitants in most areas suffer from chronic water shortages and inadequate sewage systems. In the remote areas rain water is generally collected and stored in large earthenware jars. In addition to being risks of contamination, these jars are breeding sites for mosquitoes. To combat this situation, an increasing number of shallow wells are being dug in the rural areas. They are constructed with concrete linings and are a marked advancement over the use of untreated surface water from the rivers and canals. The government has assisted in providing more sanitary wells to these rural areas every year.<sup>1</sup>

The field of preventive medicine covers various types of activities. Some of the important activities are as follows.

1. Improvement of environmental hygiene.

- a. Safe water supply.
- b. Adequate refuse disposal.
- c. Provision for sewage.

2. Control of certain communicable diseases.
3. Provision of adequate statistical data to evaluate the efficiency of available health measures.
4. Provision of adequate health centers and mobile health units to the rural areas.
5. Extension of family planning and maternal and child health.

#### Health Education Measures

It has been increasingly realized that all health programs, whether they be in disease control or in health promotion, can be truly effective only with the support and participation of the people. In 1942, with this viewpoint in mind, the Division of Health Education was established in the Department of Health. The program was begun in Bangkok and several provinces with the inauguration of medical examinations, immunizations, and treatment of school children. In 1955, with the assistance of ICA, a five-year program of expansion was implemented. Health education programs were also started through schools, health centers, and health mobile units throughout the country.<sup>2</sup> Extensive B. C. G. campaigns were also carried out. In 1955 the division was reorganized; as a result, many of the staff were trained abroad, equipment was provided, and additional space was constructed. Since 1959 the division has been almost fully equipped, and has been able to produce a variety of health education materials as required by the various health programs and provincial health departments. Such materials have improved the efficiency of the health workers,

and have given them a better understanding of modern concepts, methods, and techniques used in health education. Health education has been introduced into the training courses of various types of health workers. Owing to the growing cognizance of the need for health education, more health agencies have requested assistance in integrating it into their health programs. The health education staff consequently has been engaged in many joint committees for health education planning.

#### Major Diseases and Disease Control

The lack of medical personnel, of diagnostic facilities, and of medical care in the provinces has led to a corresponding lack of disease incidence reports sufficient to permit accurate evaluation of their significance. Private hospitals and practitioners are seldom diligent in reporting disease; hence, the available data has been obtained principally from government hospitals and health units. In Thailand, communicable diseases continue to be the major cause of illness and death. Chronic and degenerative diseases are reported with increasing frequency. In 1965 heart disease was the sixth leading cause of death. Hypertension, diabetes mellitus, and cerebrovascular disease are not uncommon, and patients with carcinoma of the liver are frequently reported. Bladder stones are endemic in certain areas of the northeast, where cystolithectomy is the most common surgical procedure in several hospitals. The bladder stone problem of the children in this region is under investigation.

#### Malaria

This disease has long been a serious public health menace in Thailand. It used to be prevalent throughout most parts of the country

and was, until recent years, the greatest cause of sickness and death. A well defined rise in disease incidence was noted during the rainy or wet season.<sup>3</sup> *Plasmodium falciparum* is the most common species of malaria, accounting for about 80 per cent of all cases.<sup>4</sup> The remaining cases are due almost entirely to *P. vivax* and *P. malariae*. Between 40,000 and 50,000 deaths from malaria were normally reported in a single year. Today, the number of deaths caused by malaria is considerably less, but the cost to the nation in terms of manpower is still high. In many people malaria becomes chronic, never incapacitating them completely or causing them to require hospitalization, but constantly reducing their energy and well-being. In 1960 the World Health Organization (WHO) reported that an estimated fifty million agricultural work days were lost annually because of malaria. The anti-malaria campaign, employing the new technique of residual insecticide house spraying, was commenced in 1949 with the assistance of WHO and UNICEF. A pilot project carried out in the province of Chiangmai illustrated the fact that, by DDT indoor residual spraying, malaria transmission in a controlled area could be totally interrupted. Since 1952, based on the Chiangmai experience, the Ministry of Public Health with United States Agency for International Development assistance has been actively engaged in a nation-wide effort to eradicate malaria. In 1965 only 4,522 deaths from malaria were recorded; the death rate per 100,000 population was only 15.2 as compared with 328.9 in 1943. However, since it had been illustrated that malaria could be completely eradicated, the government decided in 1958 to convert the Malaria Control Program to a program of eradication. Since

then many urgent measures have been taken by the government to insure the coordination of all agencies concerned and to overcome the administrative and technical difficulties which have impeded the progress of the program. To secure fuller cooperation from the provincial government agencies, a National Eradication Board has been formed.

#### Enteric diseases

This group of diseases is one of the most important causes of morbidity and mortality in Thailand. Localized foci of dysentery are common, especially in the northeast, during the dry season when drinking water is scarce. Poor environmental sanitation and personal hygiene are the most important factors in parasitological infection (*Ascaris lumbricoides* and *Trichuris trichiura*).<sup>5</sup> The attack rate among children is relatively high; the case fatality rate for children is 5.1 per cent. Pathogenic *Escherichia coli* and *Shigella* have been associated with some of the outbreaks in the pediatric age groups. Diarrheal disease studies have shown salmonellosis to be widespread; typhoid and paratyphoid are endemic and occur in annual sporadic outbreaks.

Cholera was formerly the most critical health problem of the country. The last cholera outbreak occurred in 1958-1959. In an eighteen-month period 19,359 cases, with 2,732 deaths, were recorded. The cases outnumbered those of previous outbreaks (totalling more than double the previous record of 1946), but the former fatality rate of 60 per cent was reduced to 12 per cent. Cholera started again in the southern part of the country in July of 1963; 1,724 cases and 141 deaths were recorded.

In 1964 the total number of patients was 1,387 and the total deaths numbered forty-seven. The number of cholera patients decreased to one or two per month. Mass vaccination against this dreaded disease has been performed continuously; it is expected that the disease will soon disappear.<sup>6</sup>

### Tuberculosis

In 1951 a national tuberculosis survey on a sampling basis was carried out in cooperation with WHO and UNICEF. After initiating a successful pilot project, a mass case-finding and ambulatory treatment campaign was launched in Bangkok, as well as in other parts of the country where regional TB headquarters had already been established. B. C. G. vaccinations were administered to five million children in order to immunize them against the disease. This immunization program is being continued as part of the national health plan. Tuberculosis control services have been developed along the lines of modern diagnosis, treatment, and control. In the course of expansion of services, the Central Chest Clinic in Bangkok was modernized to serve as a Tuberculosis Demonstration and Training Center for medical and paramedical personnel. Additional chest clinics were subsequently set up in Bangkok, Chiangmai, and the Khonkaen province. In addition, two mobile clinics have been organized to render ambulatory treatment to the tuberculosis patients living in Bangkok and Dhonburi. From these clinics, approximately 6,000-8,000 cases of tuberculosis were found annually out of 20,000-30,000 persons examined.<sup>7</sup> For most of these cases ambulatory treatment has been provided continuously until they have reached the non-infectious stage.

Source: Division of Vital Statistics, *Yearbook of Public Health Statistics, 1965* (Bangkok: Government Printing Office, 1966), pp. 53-61.

Tuberculosis, one of the major public health problems in Thailand, affects thousands of people each year. Approximately seven thousand persons die of this disease every year (see Table 6).

TABLE 6  
PRINCIPAL CAUSES OF DEATH IN THAILAND

(Rates per 100,000 population.)

| Cause Group              | 1961   |      | 1962   |      | 1963   |      | 1964   |      | 1965   |      |
|--------------------------|--------|------|--------|------|--------|------|--------|------|--------|------|
|                          | Number | Rate | Number | Rate | Number | Rate | Number | Rate | Number | Rate |
| TB of respiratory system | 8,438  | 31.2 | 8,760  | 31.6 | 9,377  | 33.0 | 8,416  | 28.9 | 7,668  | 25.7 |
| Dysentery, all forms     | 1,431  | 5.3  | 1,466  | 5.3  | 1,305  | 4.6  | 1,360  | 4.6  | 1,711  | 5.7  |
| Malaria                  | 6,636  | 24.5 | 6,739  | 24.3 | 6,488  | 22.8 | 5,287  | 18.1 | 4,522  | 15.2 |
| Parasitic diseases       | 3,081  | 11.4 | 3,272  | 11.8 | 3,493  | 12.3 | 3,670  | 12.6 | 3,962  | 13.3 |
| Malignant neoplasms      | 2,333  | 8.6  | 2,745  | 9.9  | 3,007  | 10.6 | 3,170  | 10.9 | 3,635  | 12.2 |
| Diabetes Mellitus        | 256    | 1.0  | 428    | 1.5  | 413    | 1.4  | 349    | 1.2  | 445    | 1.5  |
| Anemias                  | 444    | 1.6  | 497    | 1.8  | 407    | 1.4  | 326    | 1.1  | 444    | 1.5  |
| Heart diseases           | 4,699  | 17.3 | 5,373  | 19.4 | 6,092  | 21.4 | 5,876  | 20.2 | 4,743  | 15.9 |
| Influenza                | 1,306  | 4.8  | 903    | 3.2  | 744    | 2.6  | 1,011  | 3.5  | 1,024  | 3.4  |
| Pneumonia                | 7,698  | 28.4 | 8,010  | 28.9 | 7,771  | 27.3 | 7,619  | 26.2 | 6,880  | 23.1 |
| Peptic Ulcer             | 617    | 2.3  | 508    | 1.8  | 600    | 2.1  | 587    | 2.0  | 701    | 2.4  |
| Cirrhosis of liver       | 641    | 2.4  | 884    | 3.2  | 898    | 3.2  | 934    | 3.2  | 1,081  | 3.6  |

Source: Division of Vital Statistics, Yearbook of Public Health Statistics, 1965 (Bangkok: Government Printing Office, 1966), pp. 53-61.

### Leprosy

This disease is prevalent in the north and northeast of Thailand. It is estimated that there are not less than 200,000 leprosy cases in the country. WHO surveyed the leprosy situation in 1953 and launched a project in 1956 aimed at treatment of the discovered patients. By 1964 14 provinces had been covered, including the treatment of 90,000 patients.<sup>8</sup> In 1964 the project was expanded to the north, beginning with the main cities of Chiangmai and Lampang. In the same year a special budget allotment was provided for the improvement and construction of buildings in existing colonies of leprosy patients. In 1963 5 colonies opened schools for the children of these patients. Many people, unaware that the disease is curable, do not seek help from the clinics and units throughout the country; instead, partly through shame and partly through fear, they lead unnecessarily isolated and miserable lives.

### Hemorrhagic fever

This disease, first recognized in Thailand as an epidemic disease in a small outbreak in Bangkok in 1954, was first diagnosed as hemorrhagic fever in 1958. The disease recurred every year during the rainy season. In 1962 a serious outbreak involving 31 provinces occurred; 6,126 cases and 272 deaths were reported. Most of the victims were children. Before the end of 1962, a committee was formed in the Ministry of Public Health to find effective ways and means of suppressing the disease. For preventive measures, mosquito breeding places were destroyed and people were urged to protect their children from mosquito bites. For curative measures, a method for treatment was discovered.<sup>9</sup>

### Smallpox

The last major outbreak of smallpox occurred in 1950. Authorities presumed that it was spread by Thai Muslim pilgrims who contracted this disease in Mecca. Of the 1,548 reported cases, 272 were fatal. In 1962 there was only one case. The sufferer, an Indian who had just arrived in Thailand from India, became ill a few days after his arrival and died shortly thereafter. Strenuous efforts were made to trace all contacts, and preventive measures were promptly and efficiently undertaken. As a result, no secondary cases developed.

### Yaws

Yaws was formerly found to be endemically widespread in the rural areas of 45 provinces, affecting about 8 per cent of the national population. The Ministry of Public Health, with WHO and UNICEF assistance, launched a mass campaign against yaws. The primary aim was to reduce the incidence of the disease, through mass treatment, to such a level that further control could easily be continued by the rural health services. The progress of the campaign has been very satisfactory. Up to the present time, more than 1.5 million yaws cases have been treated. In addition, more than 2 million contacts have been given penicillin in prophylaxis. The campaign reduced the incidence of the disease from 6.92 per cent in 1953 to 0.36 per cent in 1961.<sup>10</sup> The last survey revealed only 442 cases among a total of 1.3 million persons examined, most of the cases being in the southern provinces.

Venereal diseases

Syphilis is estimated to affect not less than 5 per cent of the population; prenatal syphilis is found to affect about 8 per cent. Venereal diseases have long been a major public health problem. Preventive and control measures have been carried out through the V. D. control centers. The Bureau of Disease and Prevention and Control operates about 36 Venereal Diseases Control Units, and 20 additional units have been organized by 12 other government agencies.<sup>11</sup> In 1965, 22,964 out of 27,953 patients examined were found to be infected with venereal diseases. Since 1960, when the law banning prostitution was promulgated, there has been no official medical supervision of prostitutes. Although a proposal for government supervision of brothels was introduced in the fall of 1966 at the opening session of the new Congress, comprehensive prevalence and incidence data are still not available for venereal diseases. In 1964 there were 20,000 cases of venereal disease reported by the thirty-six control centers; of these cases, 4,300 were syphilis, 12,500 were gonorrhea, and the remainder were lymphogranuloma venereum, chancroid, and granuloma inguinale. Concentration on case-finding has always been an important policy in controlling venereal diseases. The aim is to give proper treatment to the patients as soon as possible. In an attempt to get closer cooperation in the control of the diseases a National V. D. Conference, attended by representatives from various health agencies, is held annually. As a result, a resolution to organize a permanent V. D. Committee at the national level to formulate a future control program has been adopted.

### Nutrition

In Thailand there are still large numbers of cases of malnutrition resulting from a lack of adequate knowledge on the part of the general population. Many of the people in the rural areas prepare and cook their food according to traditional methods.<sup>12</sup> This traditional preparation causes irreparable loss of some essential nutrients and gives rise to a certain avitaminosis.<sup>13</sup> An interesting avitaminosis is beriberi, which may be the important cause of a high mortality rate in infants and young children.<sup>14</sup> The Department of Health has been concentrating its efforts to improve faulty food habits and to encourage a balanced diet among the people. A concentrated program of nutrition education has been carried on. In 1959 a plant for the production of shark liver oil was established, and attempts were made to encourage wider use of the oil. In 1962 more than eleven million capsules were distributed to health centers and midwifery centers to be prescribed for the sick and for children, pregnant women, and nursing mothers. In 1960 the Department of Health, with the cooperation of ICNND of the United States of America, again undertook an intensive study of the health and nutrition status of Thai civilian and military personnel. The results of this study indicated that the average person's intake of riboflavin was very low, that the intake of thiamine, iron, and calcium was less than desirable, and that a high incidence of fluorosis was found in most areas except Bangkok.<sup>15</sup> With regard to the control of nutritional deficiency diseases, a project for salt iodization has been launched in the Prae province in cooperation with WHO, UNICEF, and FAO. The aim is to study

the effectiveness of salt iodization as a goiter control measure. A plant to produce iodized salt was established at Denchai, and the first lot of salt was produced in 1963. In view of the success achieved through the use of iodized salt, the program should be expanded to other provinces. Preparatory training in procedures for improving village nutrition was conducted for 174 persons under the close supervision of the provincial nutrition committee. This project has progressed satisfactorily.

#### Mental Health

At present, there are 9 mental and neurological hospitals in Thailand, with a total capacity of 5,100 beds. It is obvious that the existing facilities in mental institutions are insufficient to cope with the increasing number of mentally ill patients. During the period 1956-1961, all mental hospitals were able to expand their facilities by the addition of new buildings and by increasing their staffs. Despite the improvements that have been achieved, hospital facilities for mental patients are still considered inadequate. During recent years all mental hospitals have installed more medical facilities to meet the needs in all branches of psychiatric services. Recognizing the importance of the preventive aspect of mental health, the government has set up many child guidance clinics in Bangkok since 1953.<sup>16</sup> Their primary purpose has been to deal with the emotional and behavioral problems among the younger generation. In February, 1963, the Neurological Research Institute was inaugurated by His Majesty the King, who graciously donated a substantial sum for its construction. It will serve as a national center for medical research in

various fields of neurology.

According to a survey conducted in certain rural areas, there is a relatively high number of mentally deficient persons whose care and supervision constitute a grave social responsibility. The expansion of mental health work includes the establishment of a mental hospital at Khorat and a neurological hospital now under construction at Songkhla. The extension of child guidance clinics and outpatient neurological centers is also a part of the program.

#### Medical and Public Health Research

Various fields of medical science are conducted for the purpose of aiding, promoting and coordinating scientific research on human disease and its causation, prevention, and cure. Research concerning public health is the main responsibility of the Department of Medical Sciences. Some of the chief activities include research in virus diseases, cancer, parasitic diseases, diseases of the blood, neurology, and food consumed by the Thai people. It is obvious that the achievements of research work have resulted in a spectacular reduction of the death rate for many diseases. During recent years, diseases such as cholera, plague, and smallpox have lost much of their severity and importance. Hemorrhagic fever, which occurred every year during the rainy season, has also been suppressed. Plans for future expansion of research work are being carried out in many parts of the country.

#### Foreign Aid - Health Programs

Since 1948, UNICEF has helped Thailand in many fields, most notably in health and health education. By the end of 1962, UNICEF aid to Thailand totalled \$4,209,800. UNICEF has given penicillin and equipment for the

yaws campaign, and has inaugurated the production of freeze-dried small-pox vaccine. Simultaneously, in its effort to intensify the fight against disease, UNICEF has attempted to improve the rural maternal and child health services by equipping an increasing number of clinics and by training nurses, midwives, and junior health workers. In 1962 Thailand received its first major grant from UNICEF for an education program. The five-year program that was established brought in the total sum of \$1,235,000. In the nutrition field, UNICEF has equipped a plant in Bangkok for the production of shark liver oil capsules, and has assisted a pilot project in applied nutrition in the northeast region. In addition a goiter control pilot project has been started in the Prae area.

While UNICEF has been contributing equipment to Thailand's fight against disease, WHO has been assisting with technical advice. In 1963 there were 22 WHO experts in Thailand assisting the government in 15 public health projects with personnel, technical advice, supplies, and equipment.<sup>17</sup> Some of these projects are part of a campaign against such major communicable diseases as leprosy, yaws, malaria, and trachoma.

Medical education in Thailand has received considerable assistance from UNICEF, WHO, and the United States of America. In addition to the efforts of UNICEF and WHO in the training of personnel for the maternal and child health centers of Bangkok and Chiangmai, the United States Operation Mission (USOM) has established the Health Training and Demonstration Center at Thonburi for public health workers. Under a contract financed by USOM, the University of Illinois College of Medicine has supplied a two-man team to

the medical school in Chiangmai for the purpose of upgrading the curriculum and developing a research program.

Additional assistance is received from the government of the United States through the Seato Medical Research Laboratory, which was established in 1960. Its mission is to conduct research in the field of tropical medicine, including treatment, and to assist in the education and training of medical and paramedical personnel through instructional programs.

#### Footnotes

<sup>1</sup>Division of Vital Statistics, p. 127.

<sup>2</sup>Ministry of Public Health, p. 15.

<sup>3</sup>Linnea M. Brown, et al., Effective Preventive Medicine for U. S. Forces During Limited Warfare in Thailand, Report to the Department of the Army, Washington, D. C., April, 1962 (Maryland: Research Analysis Corporation, 1962), p. 37.

<sup>4</sup>Department of Health Data, p. 24.

<sup>5</sup>Thongchai Phapasathorn, "Role of Parasitological Survey in Health Assessment of a Community," Journal of Public Health, I (July, 1968), p. 67.

<sup>6</sup>Leon J. Le Beau, et al., Cholera and Enterobacteriaceae Study in Chiangmai, Report to the Seato Medical Research Laboratory and the Clinical Research Center, Bangkok, April 15, 1965 (Bangkok: Office of the Seato Medical Research Laboratory, 1965), pp. D21-D34.

<sup>7</sup>Division of Vital Statistics, p. 123.

<sup>8</sup>Department of Health Data, p. 28.

<sup>9</sup>Mark R. Marigotta, et al., A Method for the Treatment of Thai Hemorrhagic Fever, Report to the Seato Medical Research Laboratory and the Seato Clinical Research Center, Bangkok, April 15, 1965 (Bangkok: Office of the Seato Medical Research Laboratory, 1965), pp. A104-A119.

<sup>10</sup>Division of Vital Statistics, p. 141.

<sup>11</sup>Smith, p. 149.

<sup>12</sup>Ibid., p. 135.

<sup>13</sup>Anusit Rachatasilpin and Amara Chandrapananda, "Comparison of the Riboflavin Nutritional Status Between the Post-graduate and Under-graduate Students in Regard to the Socio-economic Aspects," Journal of Medical Association of Thailand, XLI (October, 1966), 745.

<sup>14</sup>Ray A. Olsson and Chiyan Kampanart-Sanyakorn, Epidemiological, Clinical and Biochemical Studies of Beriberi in Infants and Adults in Thailand, Report to the Seato Medical Research Laboratory and the Seato Medical Research Center, Bangkok, April 15, 1965 (Bangkok: Office of the Seato Medical Research Laboratory, 1965), pp. H19-H21.

<sup>15</sup>Interdepartmental Committee, Report of the Committee, Nutrition Survey 1960 (Bangkok: The Government Press, 1962), p. 40.

<sup>16</sup>Division of Vital Statistics, p. 121.

<sup>17</sup>Ministry of Public Health, p. 12.

## CHAPTER VII

### SOCIAL WELFARE PROGRAMS

Social welfare services in Thailand have been largely initiated by the government rather than private enterprise. Public agencies, however, recognizing that the task of meeting the welfare needs of the people cannot be accomplished without assistance from the general public, are seeking to promote the development of voluntary agencies. A number of voluntary private charitable and religious groups carrying on welfare activities, including the Thai Red Cross Society, the Young Men's Christian Association, the Young Women's Association, and the Women's Culture Clubs, are organized in each of the 71 provinces of the country. There are also private foundations for the crippled, the deaf, and mentally retarded.

#### Medical Care and Homes for the Aged

In 1953, as a result of the increasing longevity of the population, the government undertook to construct the first home for the aged. It was constructed at Bangkai, a small district in Thonburi. During the succeeding 2 years, 2 more homes were opened in the provinces. The age limits for admission are 65 for men and 60 for women. Residents are provided with all the necessities of life, including free medical care. In these 3 homes for the aged, there are approximately 520 persons.

### Home of the Disabled and Rehabilitation

Assistance to crippled and disabled people is provided in the form of institutional boarding care. Residents are usually accommodated in 10 groups of cottages. The care of the patients is entrusted to full-time government employed nurses and physicians who also visit the homes on a part-time basis. As a measure to help them make use of their abilities, patients are encouraged to participate in the planned training and work therapy. The activities include occupations such as mat-making, wicker-working, weaving, gardening, and animal farming. Trainees earn a modest income by selling their products. Plans are now underway to adapt the home into a more modern rehabilitative center.

### Drug Addiction and Rehabilitation

The Ministry of Public Health coordinates with the Department of Public Welfare in providing treatment and rehabilitation to those drug addicts who come voluntarily for assistance or who are apprehended by the police for violation of the law. After arriving at the convalescence center, the patient is placed under close medical care for three weeks. He then goes through a period of convalescence from three months to one year. When he has recovered, arrangements are made for him to attend a course of trades-training. In addition to treatment and rehabilitation, the government also provides assistance to families of patients found to be in need. At the time of discharge, social workers assume the responsibility of helping each patient to find a job. Follow-up supervision is given in an attempt to ensure that he is happily settled in the community.

### Service to Crippled Children

After the epidemics of poliomyelitis in 1952-1953, a group of interested citizens, seeing the need for after-care service, started the Foundation for the Welfare of the Crippled in 1954. It was recognized by the government in 1955. Initially, members of the Foundation offered transportation services for children attending the hospital for post-polio treatment. Cars were lent by the members, who were also responsible for raising funds for the Foundation. The Foundation also supplies artificial limbs to the children.

### The Thai Red Cross Society

The work of the Thai Red Cross Society began in 1893, when Thailand was engaged in a struggle with France over territory in what was then known as French-Indochina. The original purpose was to provide medical service, food, clothing, and other necessities for wounded soldiers during the time of war. In 1914 a hospital was built for the Thai Red Cross at the command of King Rama VI. It is called Chulalongkorn Hospital. In 1921 it was accepted as a part of the International Red Cross. The work of the Thai Red Cross Society is threefold: Health and Relief Services, the Junior Red Cross, and Red Cross Volunteers.

Health and Relief Services provides public health education and services, medicines, medical equipment, and emergency measures. The Society owns and operates 2 hospitals and 9 local public health centers. The Society makes serums for snake bite victims; this serum is distributed to hospitals and medical units throughout the country. In 1953 a blood bank

service was added to the Society's program. The Society is also responsible for the production of vaccines against cholera and other communicable diseases.

The Junior Red Cross was organized in 1922. Its objective is to provide training for members in the area in personal and public health hygiene and to promote responsible citizenship.

The other part of the Society is the Red Cross Volunteers. Their program includes recreation, health, and welfare services, including public safety and public education. The members usually volunteer their services to the various hospitals. They help to prepare medicine and medical equipment for emergency relief units, and are active in making and distributing clothes and food to victims of catastrophes.

is made worse by the large number of medical personnel, especially physicians, who go abroad following graduation. The rising educational standards and the growing exposure to health information of a large segment of the population have created a high degree of health consciousness. This in turn has led to a greater demand for hospital care and consequently for a larger number of hospital beds. Another important factor is the rising proportion of births occurring in the hospital rather than in the home. The rise in population has also placed pressing demands on medical care. These factors all contribute to the major and complex public health problem which faces the government. The solution of only one or a few phases of the problem will not be sufficient; all phases must be approached and solved simultaneously. If an adequate number of modern physical facilities is not available, it is somewhat useless to have a qualified staff or

## CHAPTER VIII

### DISCUSSION

Improvements in the health care of the nation have resulted from the physicians' increased efficiency in working with modern diagnostic and therapeutic facilities. It is obvious that the existing facilities in the hospitals are insufficient to cope with the increasing number of patients. This insufficiency of facilities is one of the critical health problems of the nation. In addition, there is a shortage of health manpower. This shortage due mainly to the fact that only 250 physicians graduate each year, is made worse by the large number of medical personnel, especially physicians, who go abroad following graduation. The rising educational standards and the growing exposure to health information of a large segment of the population have created a high degree of health consciousness. This in turn has led to a greater demand for hospital care and consequently for a larger number of hospital beds. Another important factor is the rising proportion of births occurring in the hospital rather than in the home. The rise in population has also placed pressing demands on medical care. These factors all contribute to the major and complex public health problem which faces the government. The solution of only one or a few phases of the problem will not be sufficient; all phases must be approached and solved simultaneously. If an adequate number of modern physical facilities is not available, it is somewhat useless to have a qualified staff or

modern equipment. It is equally useless to have hospital buildings without a staff or modern equipment. The long-range planning preparatory to building hospitals must include provisions for a qualified staff and modern equipment as well as for a source of funds.

Of all the elements to be considered in the public health problem, medical education is the most important. At present there are only 4,983 registered physicians in Thailand. Only 672 of these physicians are assigned to the rural areas (see Table 1). A high ratio of physicians -- about 1 physician to 1,000 persons -- is found in Bangkok; in the remainder of Thailand the ratio has been estimated to be 1 physician to 28,500 persons. Thus it is obvious that there is a specific lack of physicians in the rural areas. In making up and maintaining the medical staffs in government hospitals, the Department of Medical Services selects physicians according to their qualifications. The size of a medical staff depends on the assignment of the organization. The main objective is to provide adequate medical care but it is realized that the Department of Medical Services cannot assign the number of physicians necessary to meet the full strength requirements of the medical staffs. There are only 672 physicians working in the 83 provincial hospitals which have a combined total of 9,126 active beds. The ratio of bed occupants to physicians is 14 to 1, a ratio which is far below the international standard. Readily understandable, then, is the great importance attached to training an adequate number of physicians for the rural areas of Thailand.

There is also a shortage of paramedical personnel in the public health field. There are 3,587 nurses and 1,093 other paramedical personnel working in the provincial areas. The government should consider a long-term program for training various types of health service personnel in order to keep pace with increases in the supply of physicians and hospital beds. This program would be another effort on the part of the government to improve the rural health services. The length of time required for training paramedical personnel is much shorter than that required for training physicians. To temporarily help solve the present physician shortage problem, trained paramedical personnel could be sent to the rural areas which lack physicians.

Another important consideration in improving rural health services is educating the rural inhabitants in a self-help program. If such a program were well planned, it would serve as the key to public health progress. There is no reason why the people involved should not respond to the offer of improved personal health services. Since some of the population in rural Thailand is illiterate and prejudiced, they traditionally believe in the superstitions of past generations. The people should be motivated to take an active part in the public health program. Health education is part of the general education from which the citizen can benefit for his own enlightenment on all matters of human well-being. Every effort should be made to communicate fully with the people, since any program is successful only if carried out with the full approval, understanding, and support of the people of the community. When the people were convinced that the health education project was for their benefit, communities would begin to practice good

personal hygiene and sanitation. They would also be able to help themselves in taking care of common ailments. In cases of acute illness, they would be able to better understand the need for seeking, without delay, the services of a physician.

The government has attempted to provide adequate medical care in the rural areas and to improve the standards of care through government hospitals and health units. An increase in the number of hospitals, health centers, and physicians in the provincial areas of Thailand has greatly improved the medical services, but the standards are significantly lower than those for Bangkok. This situation is due mainly to the shortage of physicians and medical personnel in the provincial areas. Other related causes include the lack of teaching hospitals and diagnostic facilities.

In 1942 there were only 25 hospitals under the Department of Medical Services.<sup>1</sup> Of these, fifteen were general hospitals, while the rest were mental, leper, and tuberculosis hospitals. Several hospitals in Bangkok, under the jurisdiction of the Department of Medical Services, are also used for post-graduate training of doctors and nurses.<sup>2</sup> At present, the Department of Medical Services maintains a total of eighty-six general hospitals. This figure is not sufficient to cope with the increased demands for hospital beds for the people dwelling in the rural areas.

The number of medical graduates averages about 250 per year. These physicians are graduated from three medical schools, two in Bangkok and one in Chiangmai. The present expansion of medical schools seems to be insufficient to meet the demands caused by the rapid growth of the population.

Therefore, within the next decade, the long-range plan of the Division of Medical Sciences, should include the establishment of more medical schools in the other sections of the country. The growth of the population and the rise in the standard of living are bound to generate a tremendous increase in the demand for medical treatment facilities. In planning the hospitals and medical care facilities of the future, the planners must remember that the focus is shifting from the seriously ill patient to the ambulatory patient who should have the full opportunity to carry on normal duties in order to avoid the psychological deterioration often associated with long-term hospitalization. The future of the health program rests in the hands of the medical care team.

Adequate statistical data are required to provide the necessary information on hospitalization patterns. These data will help in planning for an even distribution of beds, adequate medical personnel requirements, and avoidance of duplication of facilities, thus preserving and improving the public health in the whole country.

#### Footnotes

<sup>1</sup>Office of the Prime Minister, p. 220.

<sup>2</sup>Malcolm T. MacEachern, Hospital Organization and Management (Chicago: Physicians' Record Company, 1951), p. 525.

## CHAPTER IX

### SUMMARY

The nation's health today may be said to be in a favorable position under the control and responsibility of the Ministry of Public Health. The work of this ministry is distributed among its four major departments. The Office of the Under-Secretary of State performs the administrative function and correlates the work of the various departments. The Department of Health deals with the prevention and control of diseases. The Department of Medical Services operates, in various sections of the country, 86 general hospitals, nine psychiatric hospitals, and one narcotic hospital. The Department of Medical Sciences promotes research and introduces modern diagnostic procedures in the treatment and prevention of disease. Basic health services are provided to the people in rural areas by the Provincial Health Offices. This office works through rural health units which offer both preventive and curative services. Rural health centers have been established as the basic units in the health economy of the nation.

Approximately 90 per cent of the Thai people are rural inhabitants and do not have access to hospital care. Today there are 83 government general hospitals in the provinces, with at least one hospital in each province. For administrative purposes these hospitals are placed in 9 geographic regions.

Communicable diseases and malnutrition are prevalent in some parts of the country, especially in the Northeast region. These health problems are due partly to community problems such as poor nutrition, lack of knowledge, poor health, inadequate housing, and inadequate medical care. In an attempt to solve these problems, health education and school health measures have been employed. As the people become convinced that the health education project is for their own benefit, communities should begin to develop an active and purposeful interest in the practice of good personal hygiene and sanitation.

The population growth and the increase of the educational level of the people have increased the demand for more hospital care. Recognizing this need, the Thai government has developed a program for the expansion of medical services. The number of general hospitals, mental hospitals, and health units has increased, and these hospitals have been equipped with many of the facilities necessary for modern medical treatment. It is obvious, however, that the program developed is not adequate. There is still a great need in Thailand for more medical personnel, hospitals, and other medical facilities.

Numerous projects in environmental sanitation and health have been carried out under the International Cooperation Agreement with the United States of America and with the assistance of WHO, UNICEF, and several friendly countries. These agencies and countries have contributed to the training of Thai medical personnel by providing scholarships for medical

training. UNICEF has given medicine and equipment for the yaws and leprosy campaign, has equipped health centers and increased their number, and has equipped a plant for the production of shark-liver oil capsules. WHO has assisted the Thai Government in 15 health projects with personnel, technical advice, supplies and equipment. USOM has established the Health Training and Demonstration Centers for public health workers and has sent personnel to the medical school in Chiangmai.

Major diseases which have long been a serious public health hazard in Thailand have been discussed. These diseases have been the major cause of death in the nation. Since the Ministry of Public Health has launched a mass campaign against these diseases the mortality rate has been considerably lower. In addition to the prevention and control of disease the Ministry of Public Health has also dealt with the promotion of good health in the nation. An extensive program of nutritional education, expansion of mental hospitals, maternal and child health, school health, and medical research has been carried out. The government also provides medical care and homes for the aged, homes for the disabled and handicapped, services to crippled children, and treatment of drug addicts. Rehabilitation is provided for the disabled and those who have recovered from drug addiction.

The Thai Red Cross Society is one of the volunteer social welfare agencies which provide public health education and services, medicines, medical equipment, and emergency needs. This society is responsible for the production of vaccines and anti-venom serums, and operates a blood

bank service throughout the country.

This study covers a review of the public health services in Thailand, especially in the rural areas. It reveals that in the provinces the ratio of physicians to bed occupants is far below standard; the shortage of physicians poses a great problem for the entire country. Approximately 15 per cent of the Thai physicians are engaged either in government hospitals or government's public health program as regional health inspectors or provincial health officers. The rest are in private practice or on the staffs of private hospitals. There are few private practitioners outside Bangkok and the provincial capitols, and it is difficult to persuade physicians to practice away from the big cities. In rural areas the public health officers, who receive standard government salaries, suffer economically because they are unable to supplement their salaries with income from private practice--a common procedure for health officers in urban areas.

A greater interest in the physical and economic well-being of the people.

In order to increase the number of physicians the Thai government should plan to establish more medical schools in the next decade; in doing so, the government would also be increasing the availability of hospital facilities. Within the framework of available resources the Ministry of Public Health, either on its own or with the assistance of WHO, UNICEF, and other friendly organizations or countries, should continue to forge ahead

## CHAPTER X

### CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

To achieve the objective of improving health services in the rural areas, the government should increase the number of physicians and other health personnel being trained. The construction of new hospitals and the expansion of the present hospitals in the provinces are both required to support the training program. The purpose is to obtain adequate teaching hospitals in the rural areas. More health centers and mobile health units are recommended to provide adequate medical care and health education for the rural inhabitants. These centers and mobile units should be included in the rural development programs. The Thai government should also take a greater interest in the social and economic well-being of the people.

In order to increase the number of physicians the Thai government should plan to establish more medical schools in the next decade; in doing so, the government would also be increasing the availability of hospital facilities. Within the framework of available resources the Ministry of Public Health, either on its own or with the assistance of WHO, UNICEF, and other friendly organizations or countries, should continue to forge ahead

in its mission to improve health services. In 1953, to facilitate the long-range health plan, a program for the improvement of rural health was established. Although a great deal has been achieved, it is still insufficient to cope with the increased demand for medical care. Sound medical and health care programs for the rural inhabitants should be developed in keeping with both present and future requirements and with the changing patterns of medical science and technological development.

#### Recommendations

Medicine is the meeting ground of two great cultures -- the world of science and the world of humanism. Medicine today differs from that of a century ago principally in the extent to which its scientific content has increased. The people are more informed in medical matters than were their ancestors. These facts alone impose an obligation on the practitioner to be well prepared and to give the highest quality service. In most of the advances in medicine the physician has played the dominant role in seeking newer and better methods of treatment and prevention of diseases. He has also been the one most responsible for formulating hypotheses for the solution of age-old problems. Thus, a program to increase the quality of medical service to the people in the rural areas should be based on an adequate number of physicians.

The following recommendations are made for providing a high standard of health service to the rural inhabitants of Thailand:

1. Training of an adequate number of physicians specifically for the rural areas of Thailand should be established. Even though such training

will take its toll of both time and money, if physicians are properly trained, it will result in the better health of the people, a lower mortality rate in the rural areas, a greater respect for health care, and an increase in the nation's supply of doctors. To achieve the desired objective more medical schools and teaching hospitals are required. The purpose should be to distribute medical schools appropriately throughout the various parts of the country. The present large provincial hospitals may be used for teaching purposes but need to be expanded, improved, and staffed with well-qualified physicians. The improvement and modernization projects should include new lecture rooms and well equipped laboratories.

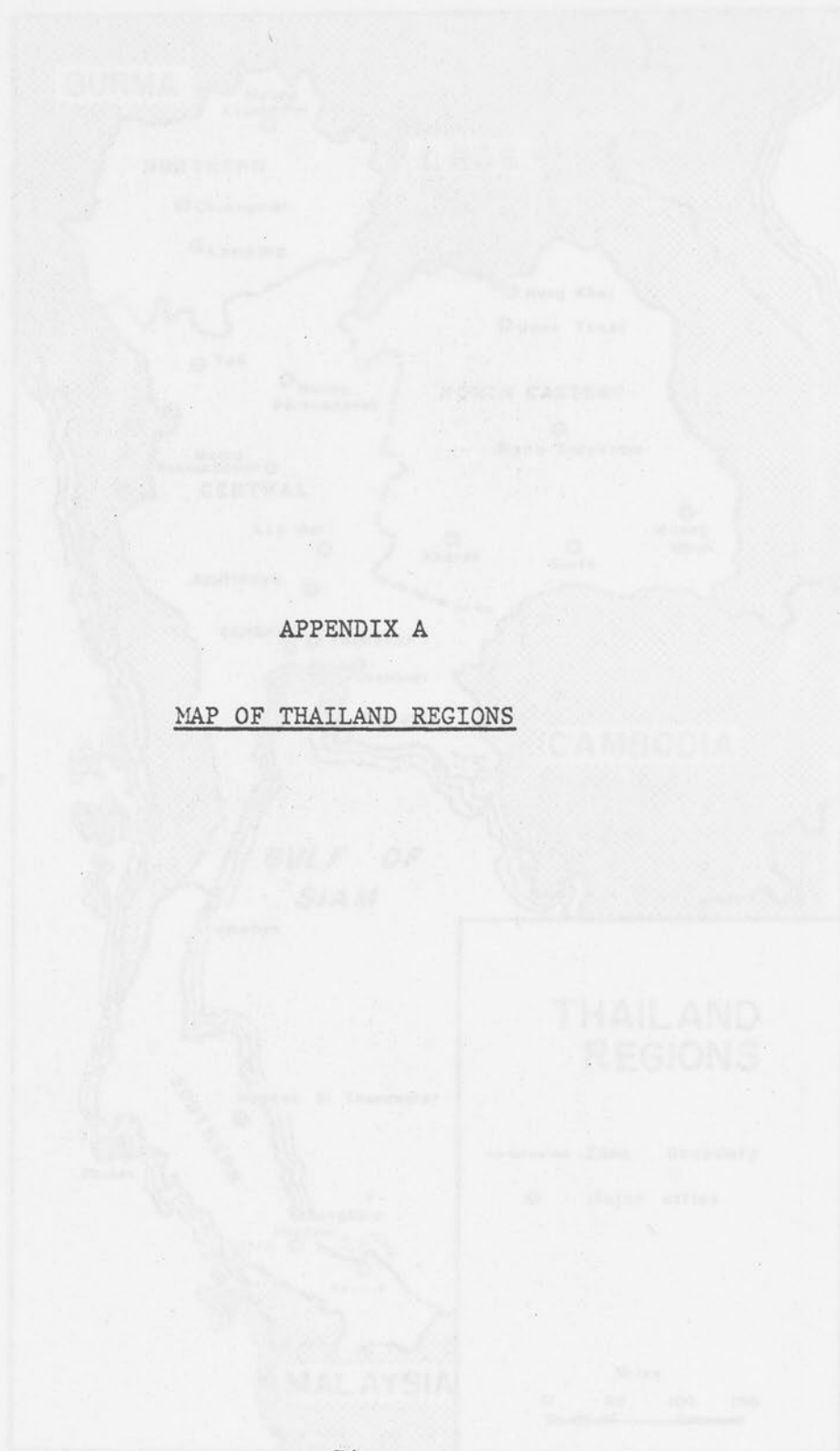
2. The number of auxiliary personnel should be increased in order to assist the professional practitioner adequately. A long-term program to help train various types of health service personnel should be considered in order to keep pace with the desired increase in the supply of physicians and hospital beds.

3. There should be an increase in the number of health centers and mobile health units in the rural areas. Mobile health units are organized to augment permanent facilities and to reach remote or transitory people. The health education provided through these units is designed to persuade people to accept help and to educate them in a self-help program. This education program is now conducted by the government but is inadequate.

4. The government should find means to stimulate and motivate physicians and other health personnel to remain in the rural areas, and should conduct further study on this problem.

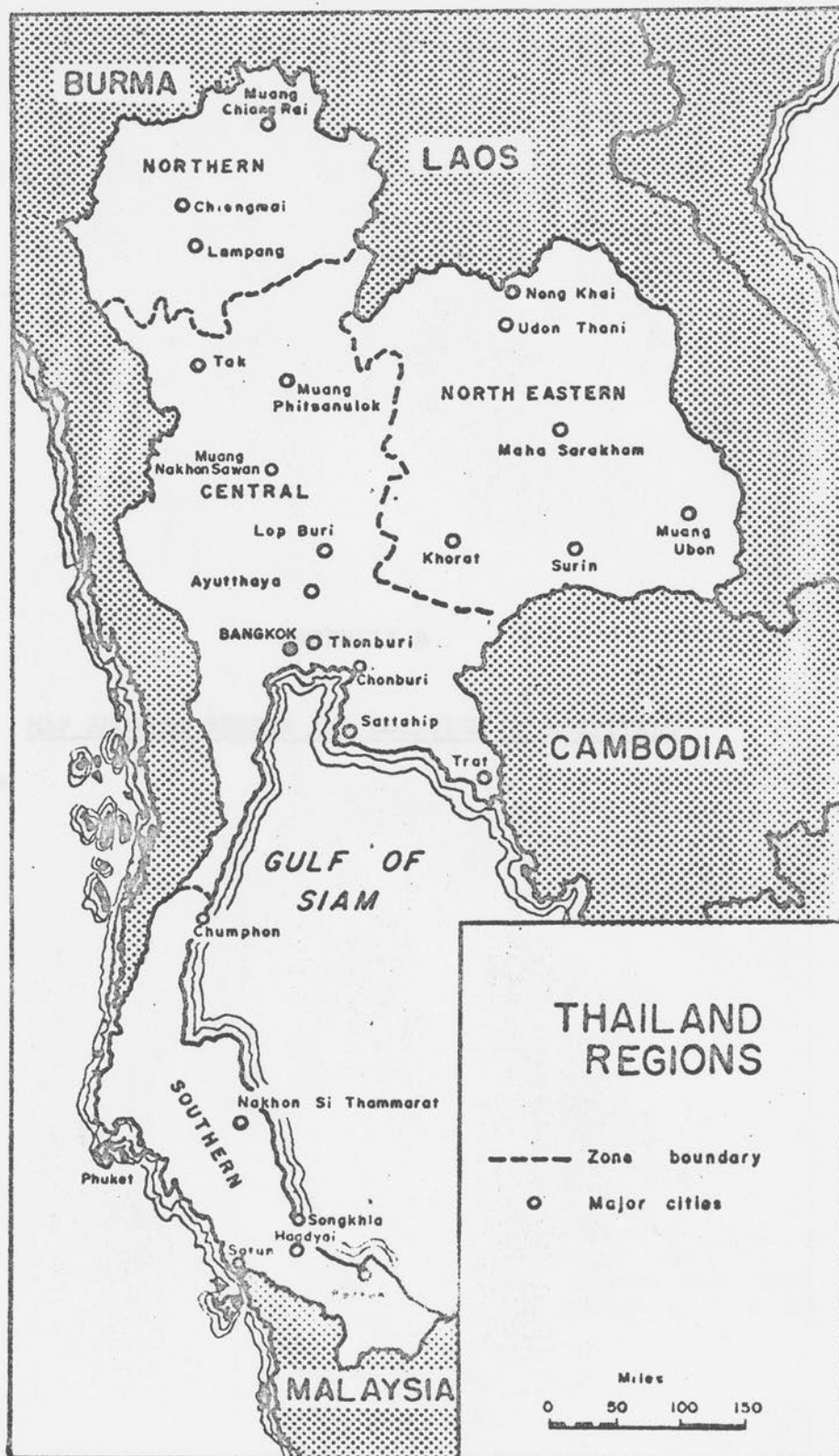
5. At the national level long-range plans should be developed on a nation-wide basis to build more hospitals and to provide hospital facilities in the provincial areas. One example is the ten-year program of hospital construction being carried out by the Department of Medical Services.

6. Rural development programs, including better communication and transportation, should be expanded in order to facilitate the improvement of health services in the rural areas.



# APPENDIX A

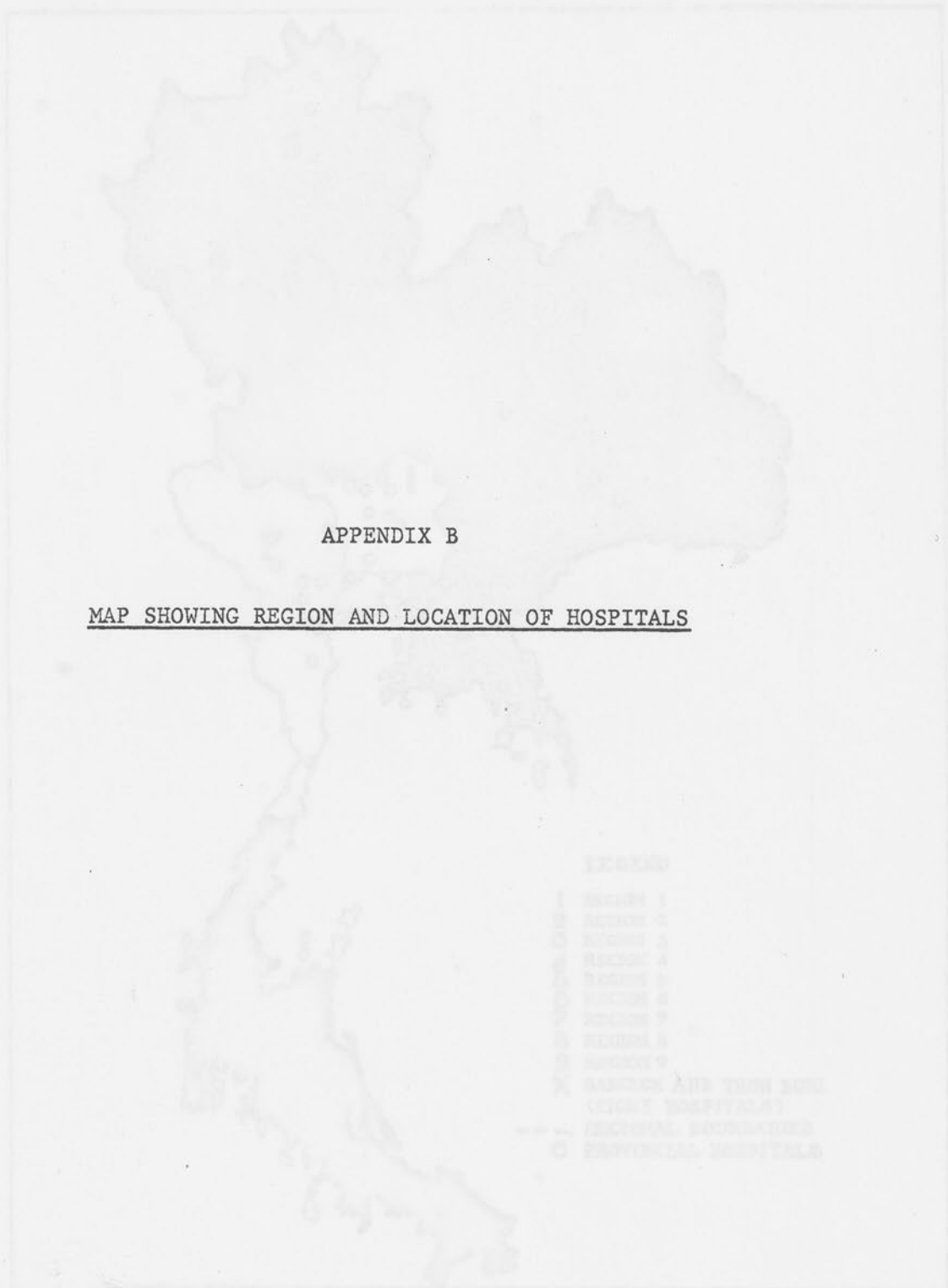
## MAP OF THAILAND REGIONS



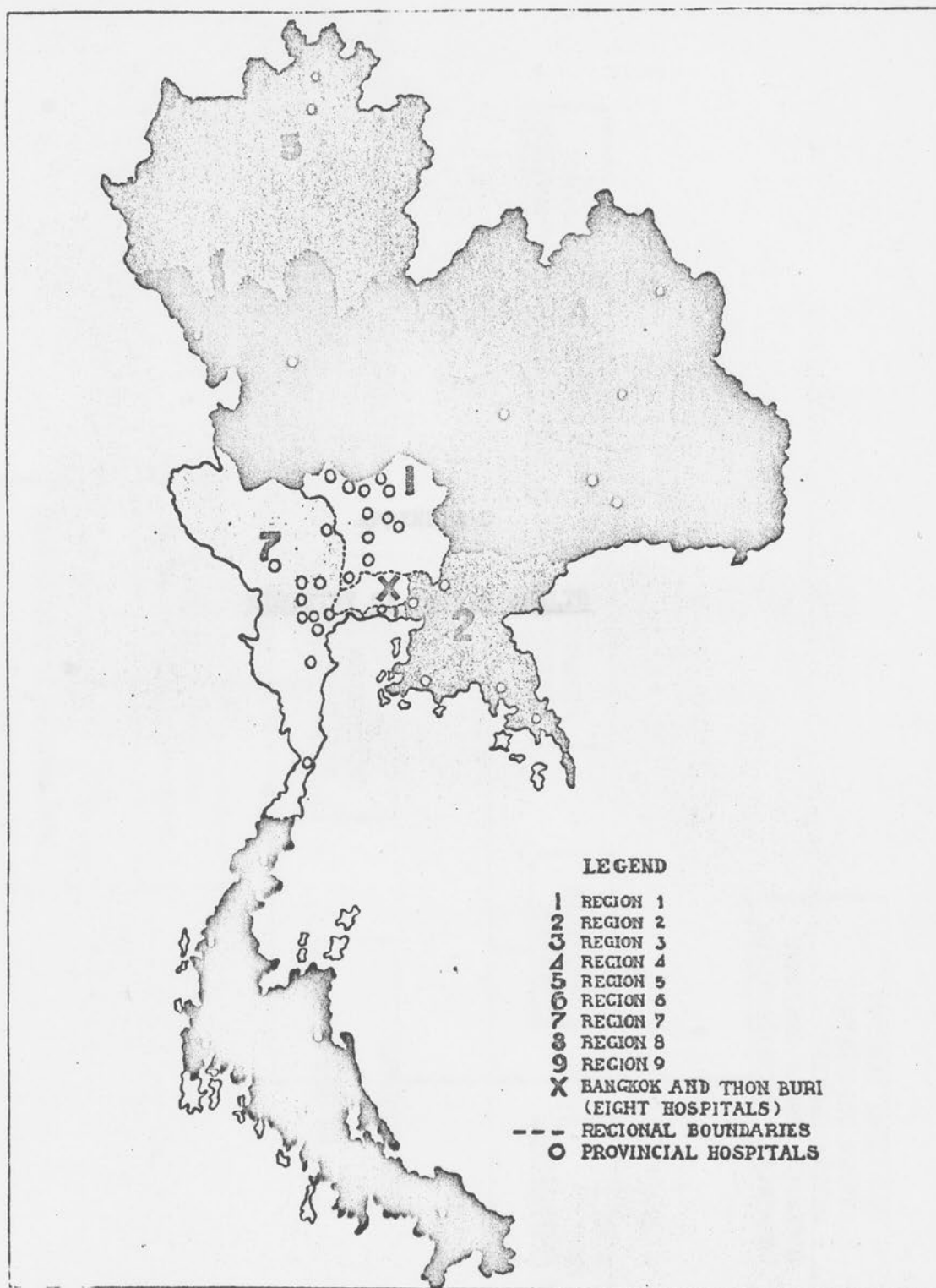
# MAP OF THAILAND SHOWING REGION AND LOCATION OF HOSPITALS

## APPENDIX B

### MAP SHOWING REGION AND LOCATION OF HOSPITALS



# MAP OF THAILAND SHOWING REGION AND LOCATION OF HOSPITALS



MINISTRY OF PUBLIC HEALTH

MINISTER OF PUBLIC HEALTH

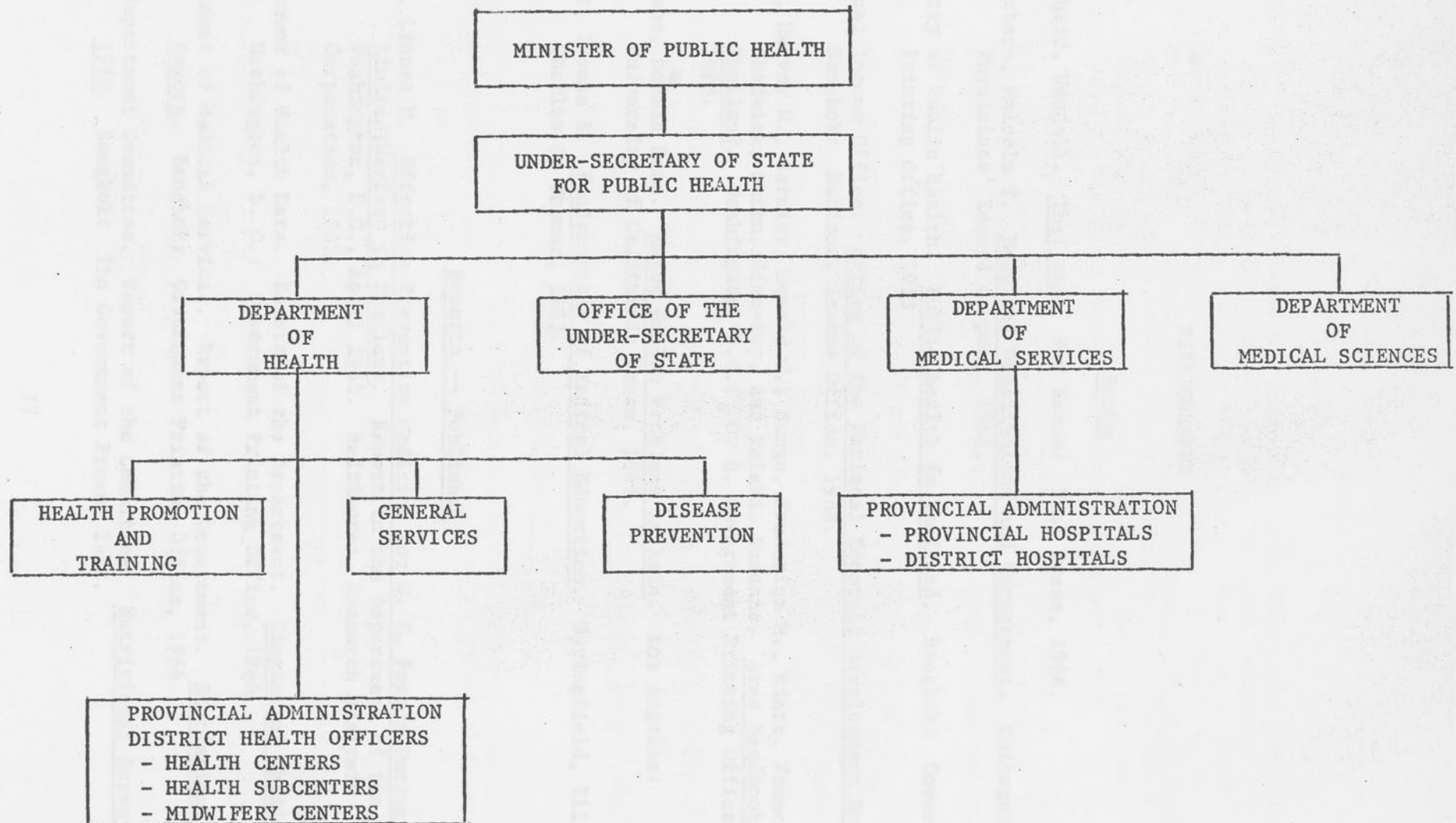
DEPARTMENT OF HEALTH

MINISTRY OF PUBLIC HEALTH

APPENDIX C



MINISTRY OF PUBLIC HEALTH



## BIBLIOGRAPHY

### Books

- Blanchard, Wendell. Thailand. New Haven: Hraf Press, 1966.
- MacEachern, Malcolm T. Hospital Organization and Management. Chicago: Physicians' Record Company, 1951.
- Ministry of Public Health. Public Health in Thailand. Bangkok: Government Printing Office, 1963.
- National Income Office. Office of the National Economic Development Board. Bangkok: National Income Office, 1968.
- Smith, Harvey H., Bernier, Donald W., Bunge, Frederica M., Rintz, Frances Chadwick, Shinn, Rinn-Sup, and Teleki, Suzanne. Area Handbook for Thailand. Washington, D.C.: U. S. Government Printing Office, 1968.
- Thompson, Donald Rene. Major Health Problems in Asia. Los Angeles: University of California Press, 1961.
- Turner, Thomas B. Fundamentals of Medical Education. Springfield, Illinois: Charles C. Thomas, 1963.

### Reports -- Published

- Brown, Linnea M. Effective Preventive Medicine for U. S. Forces During Limited Warfare in Thailand. Report to the Department of the Army, Washington, D.C., April 1962. Baltimore: Research Analysis Corporation, 1962.
- Department of Health Data. Report of the Department. Kingdom of Thailand. Washington, D. C.: Government Printing Office, 1966.
- Department of Medical Services. Report of the Department. Statistical Report. Bangkok: Government Printing Office, 1966.
- Interdepartment Committee. Report of the Committee. Nutritional Survey 1960. Bangkok: The Government Press, 1962.

LeBeau, Leon J., Noyes, Howard E., Phuangsab, Anan, Khanjanasthiti, Parimol, Poonvit, Wicha., Panas-Ampol, Kampol., Thitasut, Prayut., Chiswanich, Pien., Suksuban, Majocerieya., Swasilpa, Chongin., Promikotogaw, Chumnum., Sethakorn, Amnuay., Watanachi, Kasem., and Wilhite, John. Cholera and Enterobacteriaceae Study in Chiangmai. Report to the Seato Medical Research Laboratory and the Seato Clinical Research Center, Bangkok, April 15, 1965. Bangkok: Office of the Seato Medical Research Laboratory, 1965.

Marigotta, Mark R., Nimmanitya, Suchitra, and Halstead, Scott B. A Method for the Treatment of Thai Hemorrhagic Fever. Report to the Seato Medical Research Laboratory and the Seato Clinical Research Center, Bangkok, April 15, 1965. Bangkok: Office of the Seato Medical Research Laboratory, 1965.

Olsson, Ray A., and Kampanart-Sanyakorn, Chaiyan. Epidemiological, Clinical and Biochemical Studies of Beriberi in Infants and Adults in Thailand. Report to the Seato Medical Research Laboratory and the Seato Clinical Research Center, Bangkok, April 15, 1965. Bangkok: Office of the Seato Medical Research Laboratory, 1965.

#### Yearbooks

Division of Vital Statistics. Yearbook of Public Health Statistics, 1965. Bangkok: Government Printing Office, 1965.

Office of the Prime Minister. Thailand Official Yearbook, 1964. Bangkok: Government Printing Office, 1965.

#### Articles and Periodicals

Prapasathorn, Thongchai. "Role of Parasitological Survey in Health Assessment of a Community." Journal of Public Health, I (July, 1968), 67 - 73.

Rachatasilpin, Anusit, and Chandrapananda, Amara. "Comparison of the Riboflavin Nutritional Status Between the Post-graduate and Under-graduate Students in Regard to the Socio-economic Aspects." Journal of Medical Association of Thailand, XLI (October, 1966), 741 - 746.

Vatanabhasuk, Bulsuk. "Hospital Administration." Medical News, IV (December, 1955), 538 - 552.

Vongchai, Vichai. "Calorigenic Nutrients and Some Minerals in 117 Northern Thai Dishes." Journal of Medical Association of Thailand, XLI (August, 1966), 595 - 614.

## BIOGRAPHICAL SKETCH

Colonel Chatra Borvonsin [REDACTED]

[REDACTED] In 1948, after his graduation from medical school, he was commissioned in the Royal Thai Army as a Second Lieutenant.

In 1951 he was promoted to First Lieutenant and went to India to attend both the Malariology Course at the Malaria Institute of India and the Tropical Medicine at the Armed Forces Medical College. Returning to Thailand in 1953, he was assigned as the Medical Liaison Officer of the Royal Thai Expeditionary Force in Korea.

In 1954 he was promoted to Captain and was assigned as the Assistant Chief of the Army Blood Bank in the Thai Army Institute of Pathology.

In 1958 he became a Major. The following year he attended the Hematology Course at the Walter Reed Army Medical Center in Washington, D. C.

In 1962 he became a Lieutenant Colonel and was assigned as Chief of the Army Blood Bank in the Thai Army Institute of Pathology. During the same year he graduated from the Army Medical Service Officers' Advanced Course at the Army Medical Service School in Bangkok, Thailand.

In 1966 he was promoted to Colonel and took over as Chief of the Division of Medical Sciences in the Thai Army Institute of Pathology.

In August of 1968 he came to the Army Medical Field Service School, Fort Sam Houston, Texas, to attend the U. S. Army-Baylor University Program in Health Care Administration.