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THE LAMPANG HEALTH DEVELOPMENT PROJECT

A CASE STUDY IN INTEGRATED RURAL HEALTH CARE

Lampang Health Development Project

Ministry of Public Health

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THE LAMPANG HEALTH DEVELOPMENT PROJECT

A CASE STUDY IN INTEGRATED RURAL HEALTH CARE

I. PROJECT BACKGROUND

A. Origin and Development of Project

Health leaders in Thailand have long recognized the need to strengthen the government health care delivery system and extend basic health services to cover the majority of the Thai population, 85% of which reside in under-served rural areas. During the 1960's, the rural population grew at over 3% per year, and suffered primarily from easily-diagnosed and easily-treated conditions, such as communicable and infectious diseases common in South-east Asia, diseases of pregnancy and childbirth, malnutrition, gastrointestinal problems, skin infections and accidents. Only about 25% of the rural population had convenient access to government health facilities, and even where government health facilities were available, they were not utilized. Only 15-17% of the rural population would seek health care from government facilities and personnel. Only 2-3% of the national budget was allocated for health services, and the limited numbers of trained medical and health personnel gravitated to Bangkok and other urban centers.

In the ten years before the conceptualization and development of the Lampang Project, the Ministry of Public Health implemented two key projects directed towards strengthening the rural health services delivery system and extending basic health services which would be available, accessible, affordable, and acceptable to the rural population. The experience gained in these projects had a direct influence in conceptualizing and planning the Lampang Project. These projects were the Pitsanuloke Project and the Saraphi Project.

In 1964-68, the Ministry of Public Health implemented the Pitsanuloke

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Project in Pitsanuloke Province (population about 500,000) to strengthen rural health services through the construction of rural health centers, recruitment of additional health personnel, and training of all existing rural health personnel. Sub-district (having a population of about 5,000) health workers were selected by local people to work on a voluntary basis, but they were eventually trained and hired as sanitarians to help staff the sub-district-level health centers. The important approaches of this effort were (1) strengthening rural health services facilitated by integration of health and medical services at the peripheral service units, (2) extending rural health services by mobilizing local volunteer health workers, (3) establishing a revised record-keeping and reporting system based on family folders, and (4) establishing a patient referral system between the rural health centers and the provincial hospital. Regular supervision and a patient referral system were attempted, but could not be maintained. The project was considered a partial success, but it lacked adequate evaluation for detailed analysis and planning purposes.

During the period 1968-71, the Ministry of Public Health implemented the Saraphi Project in Chiengmai Province to find a model for rural health services, emphasizing Maternal and Child Health, Family Planning, Nutrition and Communicable Disease Control services, and promoted through the active participation of the community and village health volunteers and health communicators. A district health center, five sub-district level health centers, and six midwifery centers were constructed and staffed by newly-recruited government health workers. The highlight of the project, however, was the recruitment and training of health post volunteers in three sub-districts and health communicators in another two sub-districts. Child Nutrition Centers were established through community participation, village health posts were established by the village health post volunteers, well-child clinics were strengthened in all service units, and a patient referral system was attempted between the village health post and the government health centers. The experience gained, although not adequately evaluated, suggested that village health post volunteers and health communicators could (1) effectively promote village level health work, (2) strengthen the referral of patients to appropriate facilities, and (3) encourage community participation in operating the child nutrition centers.

In 1970, a national survey on utilization of health services in Thailand revealed that less than 20% of rural villagers utilized government rural health centers when ill. Subsequent analyses of the national health services administration and delivery system revealed that the major problems centered on the following: inadequate health service coverage, inadequate health service manpower production and distribution, inadequate health data, poor coordination between public and private health sectors, lack of communication between users and consumers, lack of community organization, inadequate health service infrastructure, and poor administrative and management practices resulting in fragmentation of services, duplication of effort, and inefficient use of severely limited resources. Ministry of Public Health leaders were determined to find the ways and means of strengthening and extending the rural health care delivery system to cover a majority of the rural population with basic health services.

In 1971, the U.S. Agency for International Development contracted the American Public Health Association to develop and evaluate new approaches for integrated rural health care delivery systems for improved health, population, and nutrition services in the developing world. The USAID-APHA proposal called for "long-term (up to eight years) pilot, experimental work to be carried out in four representative less-developed country locations...with a large population base (500,000 or more) in such a manner that general conclusions on accessibility, acceptability, and affordability can be drawn."

In 1972, the American Public Health Association approached the Royal Thai Government and the University of Hawaii to elicit interest in collaborating on a "DEIDS" (Development and Evaluation of an Integrated Health Delivery System) project for Thailand.

In 1973, a joint team of USAID, APHA, and University of Hawaii School of Public Health representatives reached agreement in principle with Thai Ministry of Public Health officials to plan a "DEIDS" project for Thailand, and the APHA and UHSPH recruited a health professional from Hawaii to work with the Ministry of Public Health for six months to help plan the project. The DEIDS/Thailand Project was planned at the Ministry of Public Health in late 1973, and the Project Proposal was submitted, approved and funded in 1974. The Project Proposal specified "after careful consideration with AID, it was decided that the planning/

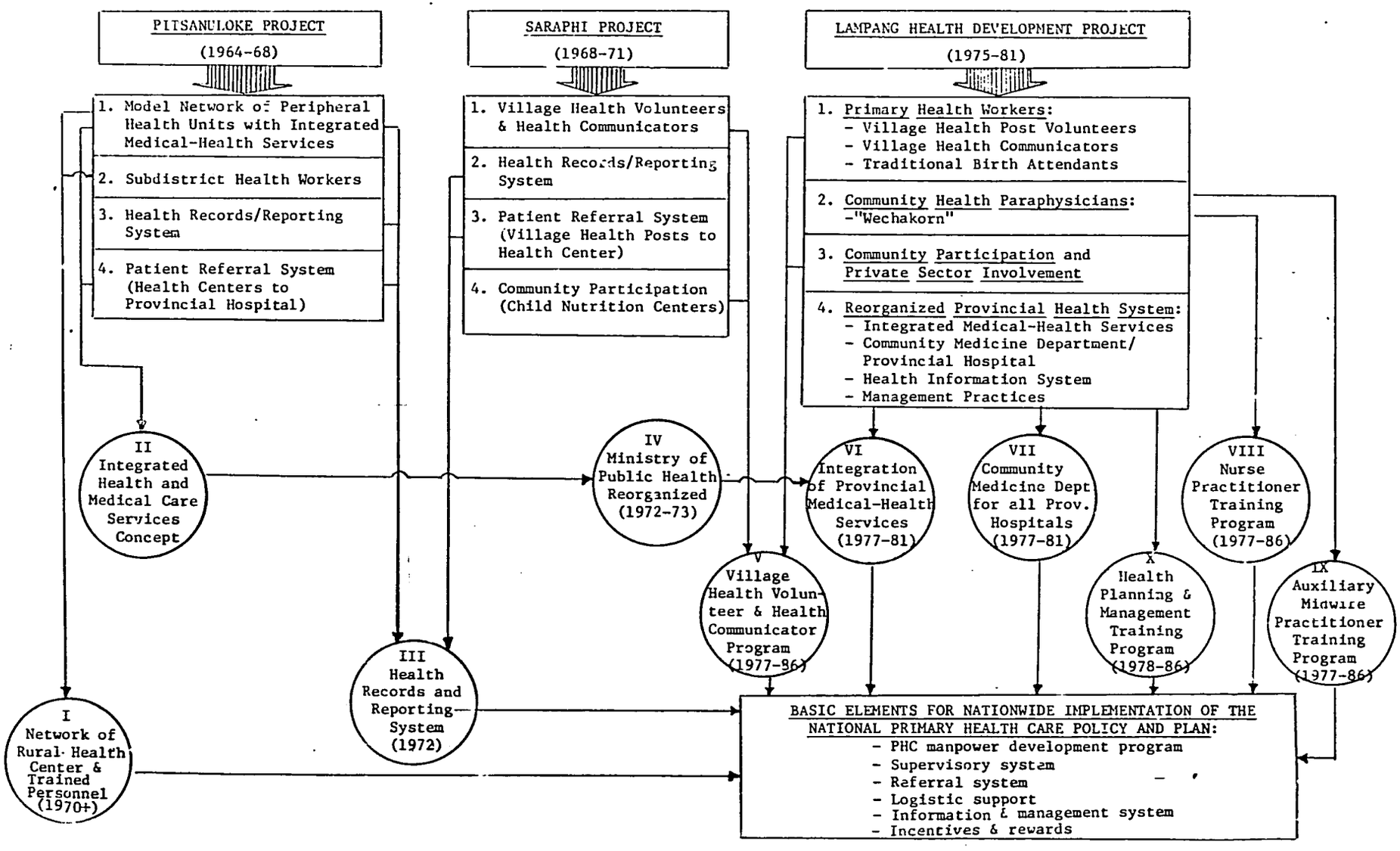
monitoring/evaluation system for the project should be exapnded, beyond the original goal of measuring how many people are reached, to include planning and programming questions, and longer-run questions of cost-effectiveness and replicability." The Project Proposal also recognized the "unless flexibility is possible during Phase III (implementation) activities, an acceptable low-cost system will be difficult to develop. Since the design of a high-coverage delivery system is unproven in Thailand, it must start with a reasonable hypothesis and let the program evolve from there through constant evaluation of services structure, utilization and cost."

The "DEIDS/Thailand Project" was inaugurated September 1974, with the RTG and the APHA signing the "Project Agreement" for development and evaluation of a health delivery system in Lampang Province, and in December 1974, the University of Hawaii signed a subcontract with the American Public Health Association to provide technical assistance to the Royal Thai Government for the purpose of the DEIDS/Thailand Project. The administrative and collaborative structure of the Project provided for "central funding" from USAID (under the USAID-APHA/DEIDS Contract), a Project Agreement between APHA and the RTG to provide financial assistance support, and a Subcontract between the APHA and the UHSPH to provide technical assistance support. The Project is approved by the Cabinet of the Royal Thai Government, administered by the Ministry of Public Health, and implemented by the Ministry of Public Health Department of Health and the Lampang Provincial Health Office. The Royal Thai Government role in planning the Project and its commitment to the goal and objectives of the Project has been noteworthy.

The northern province of Lampang, with a 1974 population of over 600,000 was selected by the Ministry of Public Health to be the site for the "DEIDS/Thailand Project", now best known as the "Lampang Health Development Project". The criteria of selection were the following: (1) a population over 500,000, (2) fair communications to and within the province, (3) a non-insurgency area, (4) moderate economic status, and (5) endorsement by provincial officials.

Figure 1 summarizes key features of development projects and their outcomes in terms of Ministry of Public Health policies, and plans for integrated health services and primary health care in Thailand.

FIGURE 1: DEVELOPMENT OF CONCEPTS AND BASIC ELEMENTS FOR PRIMARY HEALTH CARE AND INTEGRATED RURAL HEALTH SERVICES IN THAILAND (1964-1986)



B. Philosophy and Rationale of the Project

Given the limitations of budget, trained health manpower, health facilities and other resources needed for implementing and maintaining a viable and effective health delivery system, Project planners sought ways to expand health services that would be most cost-effective. They recognized that it would be far too expensive to build adequate facilities and train enough physicians, even if they were willing to reside and work in rural areas. Therefore, Project planners decided to retrain existing categories of health workers (nurses, midwives, and sanitarians) to provide a limited, but relevant range of competent curative services in the capacity of intermediate clinical care providers, or community health paraphysicians, called wechakorn in Thai. The limited number of available physicians could readily supervise the corps of wechakorn physician-extenders, and thereby significantly extend clinical care services to the sub-district (population about 5,000) level. For more sophisticated clinical care by physicians, a patient referral system was planned to link all service facilities.

Provision of integrated curative, disease prevention, and health promotion services - with particular reference to nutrition, family planning, and maternal and child health services - is more cost-effective than single-purpose provision of services. Integrated services are also more comprehensive, convenient and acceptable to service clients. Therefore, the Project aimed at integration of health services and reorganization of health system infrastructure. Strengthening management practices and operating the health system through informed decision-making, involving a streamlined health information system, would promote improved performance, efficiency and effectiveness.

A central strategy of the Project rests on the concepts inherent in the "primary health care" approach as outlined by the World Health Organization. The mobilization of all available private sector and community resources would vastly increase the coverage of the coordinated government-private health care providers. Community organization and community participation in an expanded health system would be essential. The concept of village health volunteers and health communicators, present in earlier projects, required further testing but seemed promising. It was felt that village health volunteers could be supervised and guided by the wechakorn and other health workers at the nearby health center, and that the wechakorn would provide the first referral point for village volunteers. It was

recognized that most rural deliveries are performed by traditional birth attendants. Rather than attempt to change this pattern of behavior, plans were made to train the traditional birth attendants in more sanitary practices and in recognition of conditions requiring more skilled attention.

C. Goal and Objectives of the Project

The ultimate goal of the Project is to improve the health status of the population of Lampang Province. The specific objectives of the Lampang Health Development Project in reaching the overall goal are:

1. To expand health care coverage to at least two-thirds of the rural population, especially women in their child-bearing years and pre-school age children, with an emphasis on family planning, nutrition, and maternal and child health services;
2. To establish a model integrated provincial health service delivery system which extends integrated curative-preventive-promotive health services to every sub-district health center, and to establish preventive-promotive health services in every village through trained village health volunteers; and,
3. To establish a provincial health care system that is cost-effective, meaning "lower-cost" per service unit, the key features of which can be replicated nationwide within the limitations of Royal Thai Government resources.

Through this network of health care delivery, it is estimated that only about 25% of curative care is given at the sub-district and village levels with the balance provided at the district and provincial levels. On the other hand, preventive/promotive care is more emphasized at the sub-district and village levels than at the provincial levels (see Figure 2). The Lampang Health Development Project is attempting to improve integration of health care services, as displayed by the conceptual model in Figure 3.

The overall concept is aimed at the expansion of both curative and preventive/promotive care in proportions appropriate to meet with the health needs of the population.

Given the philosophy, rationale, goal and objectives of the Project, the

FIGURE 2

EXISTING EMPHASIS OF HEALTH CARE BY ADMINISTRATION LEVEL, LAMPANG PROVINCE

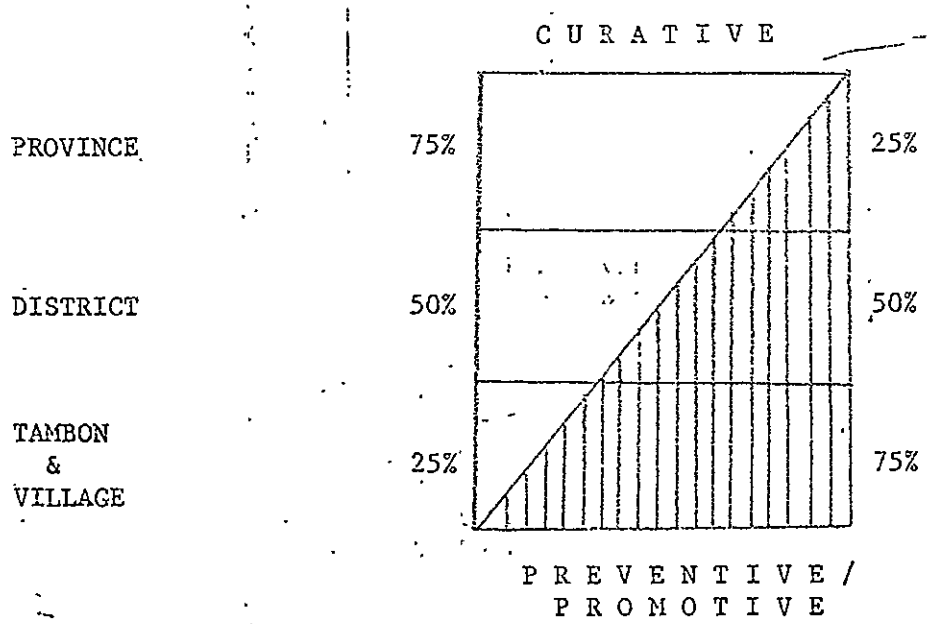
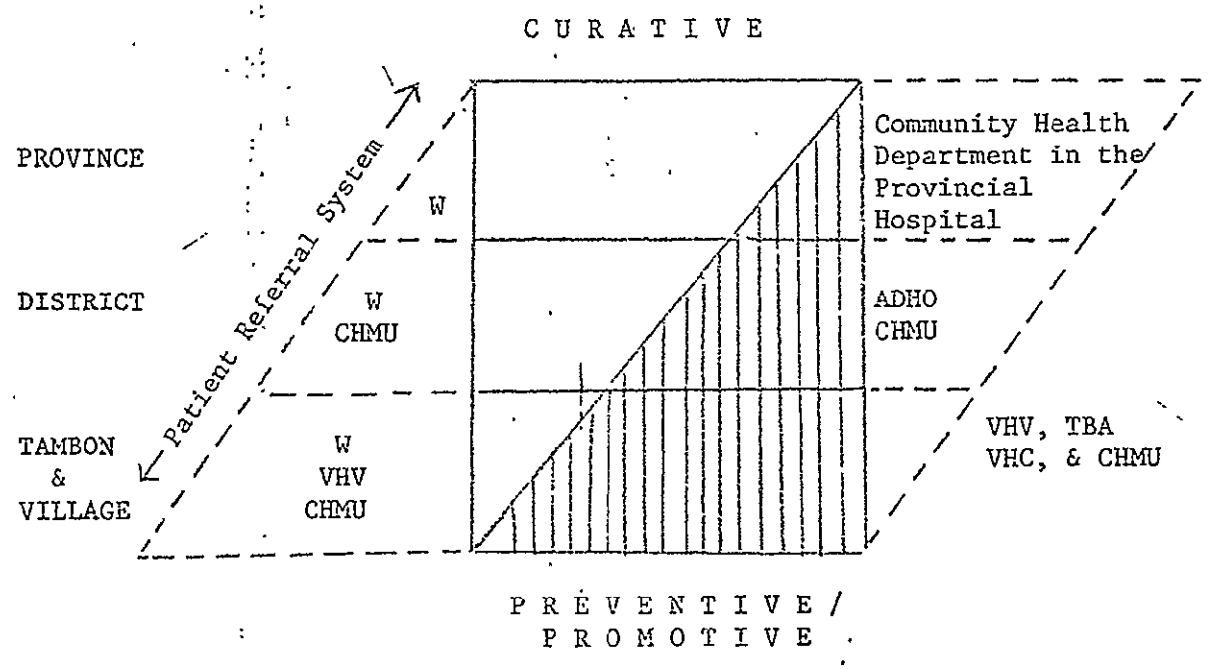


FIGURE 3

CONCEPTUAL MODEL OF HEALTH CARE IN LAMPANG PROVINCE, AS EXPANDED AND INTEGRATED THROUGH LAMPANG HEALTH DEVELOPMENT PROJECT



W = Wechakorn (Paraphysician)
VHV = Village Health Volunteer
VHC = Village Health Communicator
TBA = Traditional Birth Attendant
ADHO = Assistant District Health Officer
CHMU = Community Health Dept. Mobile Unit

specific strategies and key features will be explored after reviewing the nature and problems of the existing health system along with the demographic and health status problems of the rural population.

D. National Health Care Structure

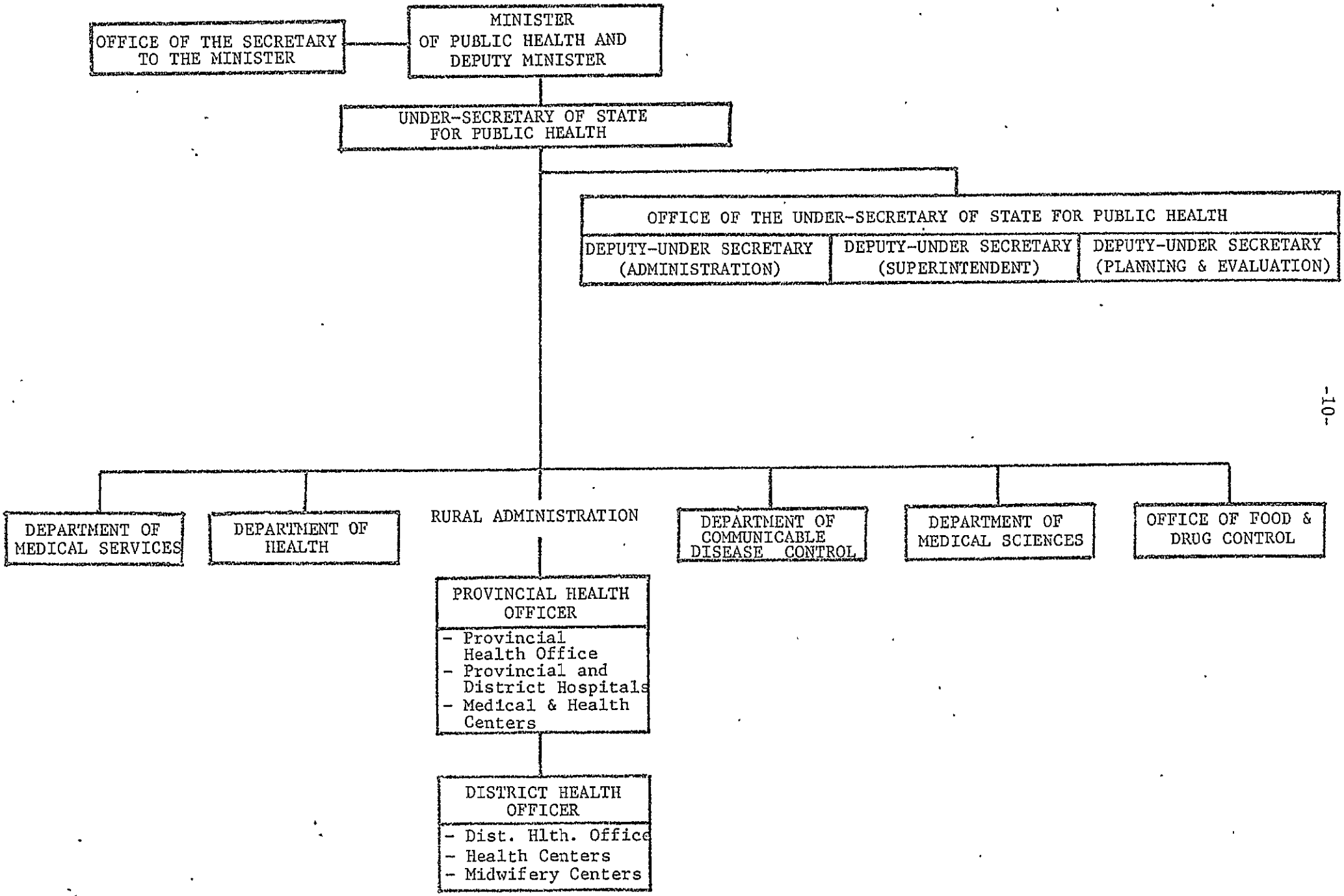
The Ministry of Public Health is the major service provider in Thailand, overseeing a widespread network of hospitals and rural health centers reaching out to all 71 provincies, to over half of the 570 districts of the country, about 60% of the sub-districts and almost 10% of the villages (see Figure 4). The Ministry in Bangkok is organized as follows:

1. The Office of the Under-Secretary of State for Public Health, coordinates the work of five ministry departments and directly administers the provincial health care system.
2. The Department of Medical Services, is responsible for specific hospitals in the Bangkok area, and special-function hospitals (including psychiatric care) in other parts of the country.
3. The Department of Health, with eight technical divisions, provides a variety of support for ministry programs relating to the environment and population.
4. The Department of Communicable Disease Control coordinates all immunization and disease control programs.
5. The Department of Medical Science is responsible for laboratory research and services.
6. The Office of Food and Drug Control is the national unit responsible for control of food and drug production and distribution.

Besides these service functions, the Ministry also trains a large number of health workers to staff its network of health facilities. It provides pre-service training for nurses, midwives, male sanitarian health workers, nurse aides, and a variety of other auxiliary personnel. It also offers a wide array of refresher courses and other types of continuing education to its personnel.

Other more specialized and highly-trained health personnel are produced outside of the Ministry. Physicians are trained in six medical schools, three of which are located in Bangkok. A large number of nurses, medical technologists, and other specialized personnel are also trained in university settings, such as

FIGURE 4: ORGANIZATION OF THE MINISTRY OF PUBLIC HEALTH



the Faculty of Public Health of Mahidol University, which provides graduate training at the bachelor and masters level for all types of health personnel who qualify for university education.

E. Provincial Health Administration

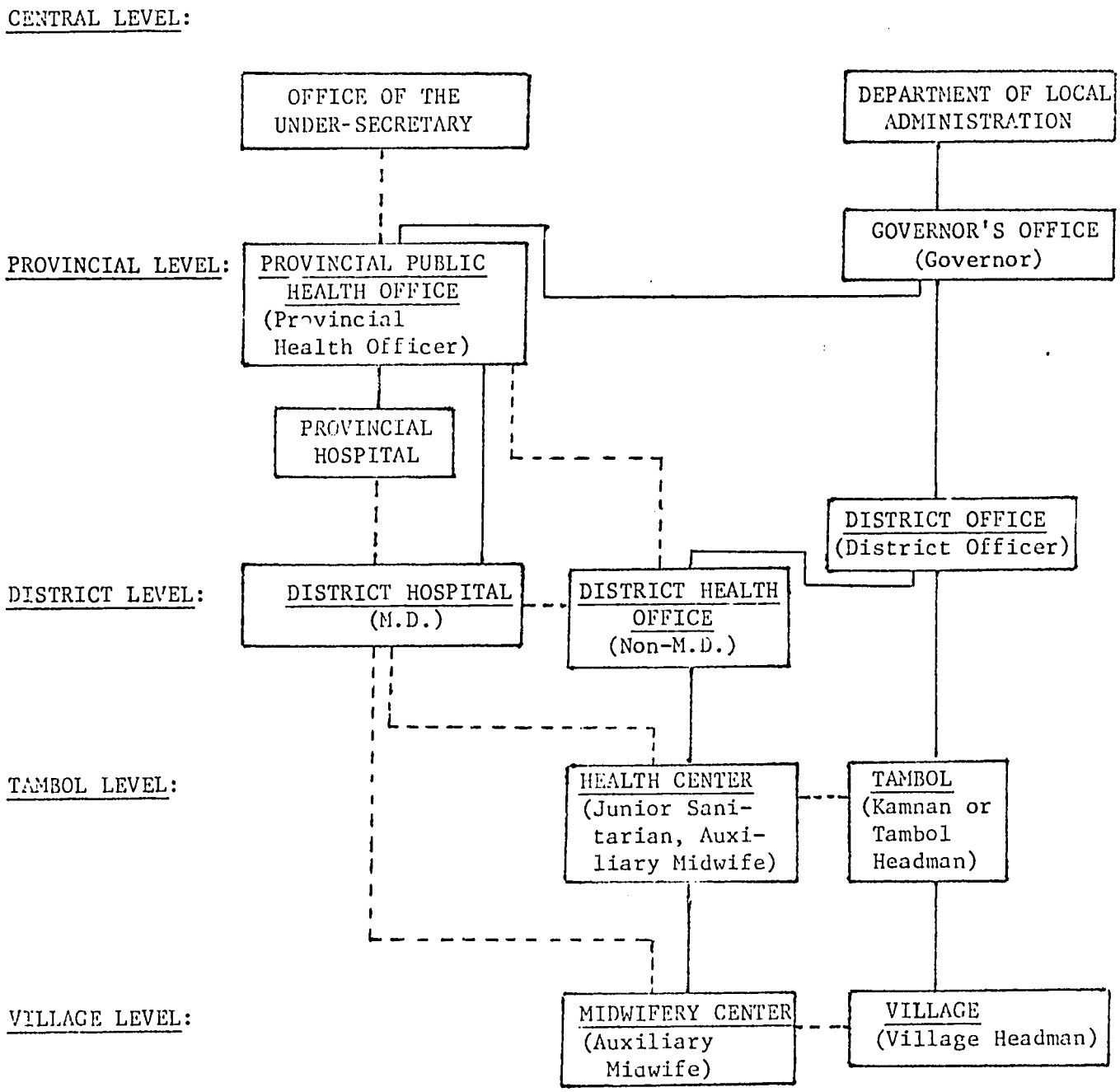
The basic administrative unit in the country is the province, each of which has a provincial health organization headed by a Provincial Chief of Medical Officer, who is directly responsible to the provincial governor, as well as to the Under-Secretary of State in the Ministry of Public Health. Although the Provincial Chief of Medical Officer is officially in charge of both the provincial hospital and rural health center network, there has traditionally been a clear separation between the provincial hospital, which provides predominantly curative care, and the provincial health office, which is responsible for the network of rural health centers, providing some curative, but mostly preventive services. Provincial hospitals range in size from about 150 to 600 beds. The Provincial Health Office has responsibility for district hospitals (formerly called first class of district medical and health centers), sub-district health centers and midwifery centers. Figure 5 shows the provincial health care organization in relation to overall provincial administration. Figure 6 shows the available provincial health facilities and coverage in 1976.

The Lampang Project is one approach that the Ministry has fostered to deal more effectively with observed inadequacies. The innovations, or modifications of the existing provincial health system that constitute the Project's key features are:

1. Reorganization and Strengthening of the provincial health service infrastructure by:
   a. integrating the curative, disease prevention, and health promotion, coordinated and administered under a single provincial health administration, involving:
   b. establishing a Department of Community Health in the Provincial Hospital, and
   c. improving management and supervisory practices, including the development of a practical management information system.

FIGURE 5

NETWORK AND ADMINISTRATIVE RELATIONSHIP BETWEEN MINISTRY OF PUBLIC HEALTH AND MINISTRY OF INTERIOR, THAILAND (1978)

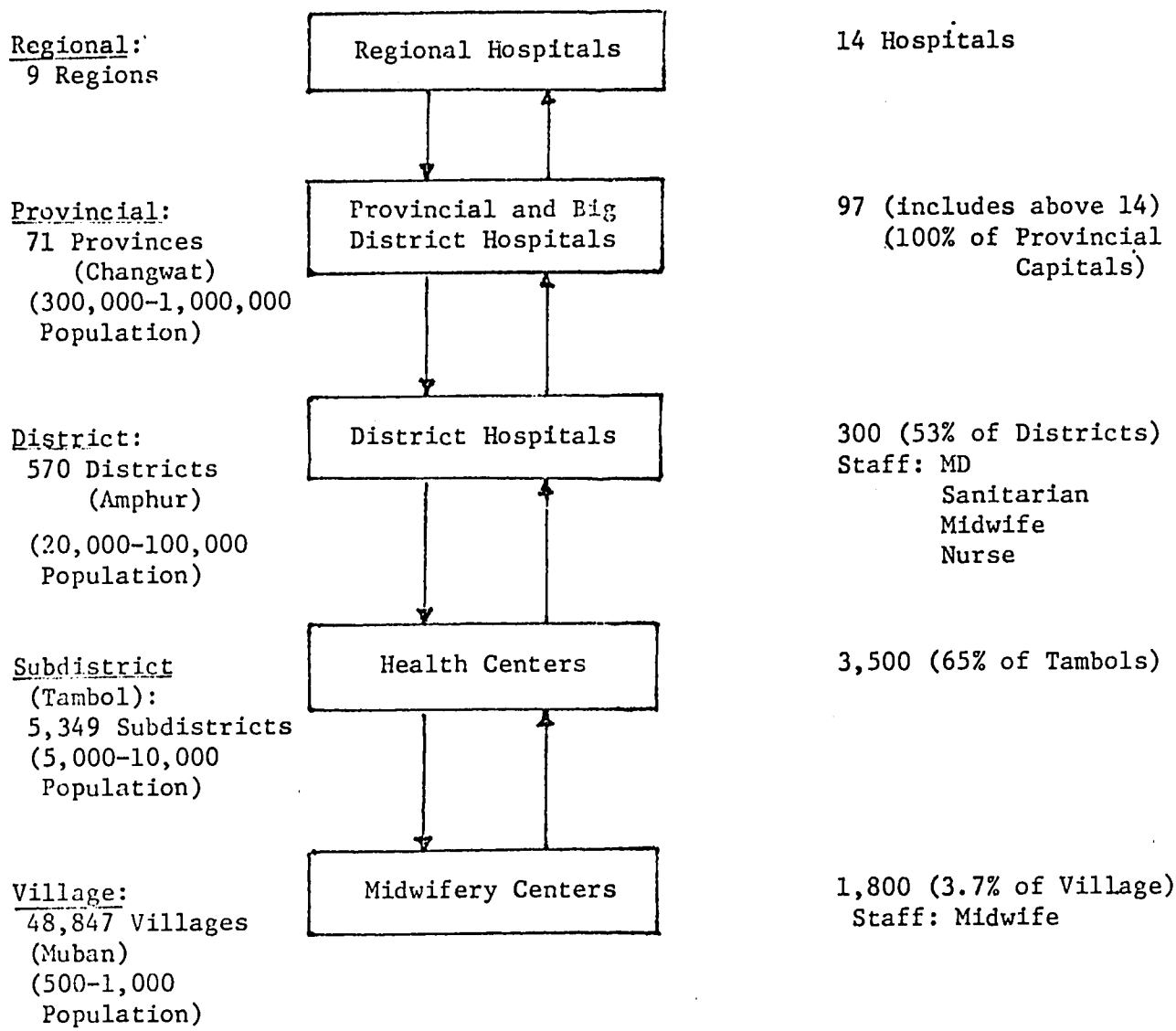


———————— Administrative Authority

- - - - - - - - - Technical Authority

FIGURE 6

CURRENT
MINISTRY OF PUBLIC HEALTH FACILITIES
AT THE PROVINCIAL LEVEL [a]
1976



[a] Source: MOPH Planning Division, 1976

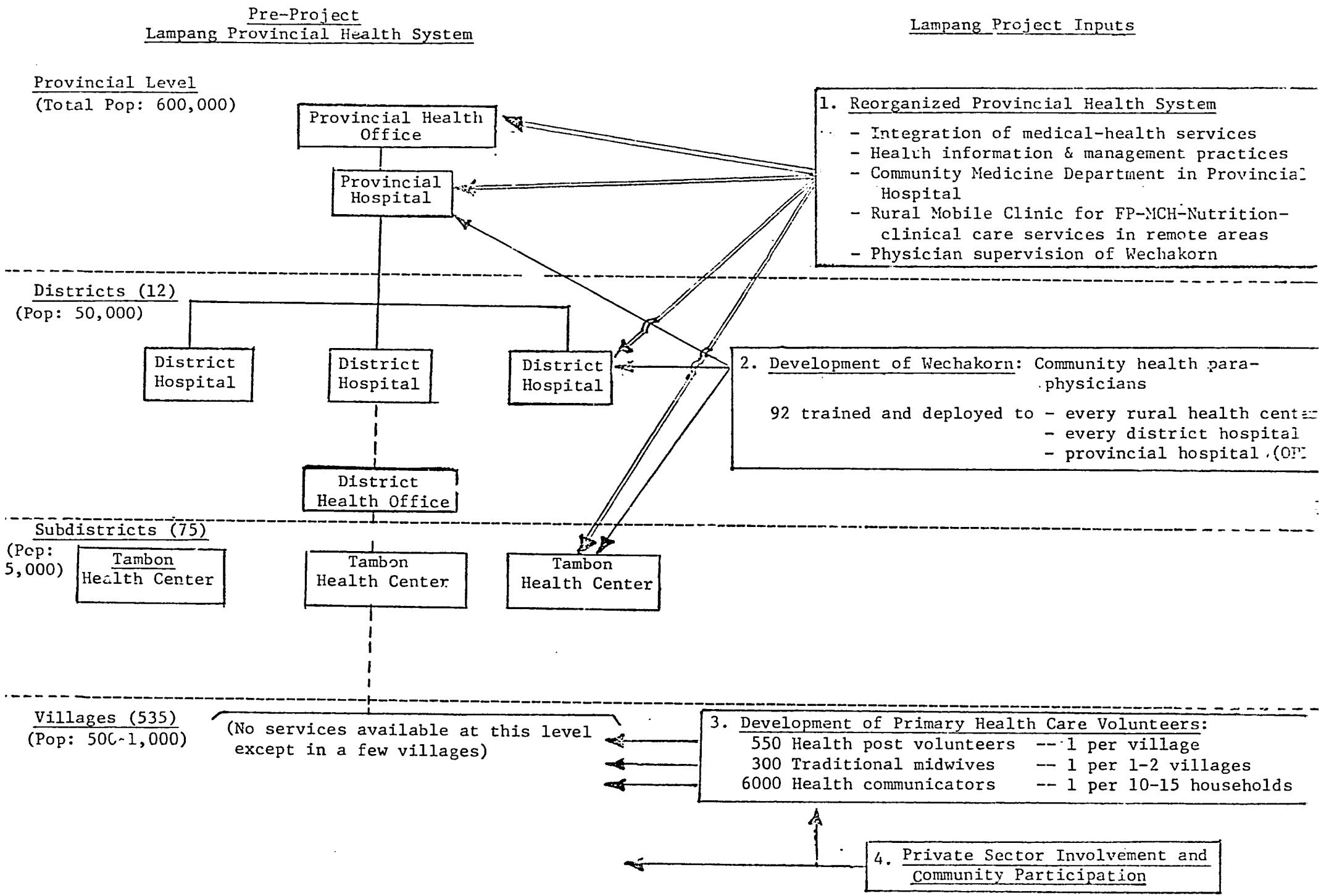
2. Development of community-health paraphysicians, called wechakorn in Thai, to overcome the lack of skilled curative services available at the periphery. Ninety-two wechakorn, recruited from among nurses, midwives, sanitarians, and nurse aides have been trained for one year in the provincial and district hospitals, after which the majority return to assignments in sub-district health centers.
3. Deployment cadres of community health volunteers in every village of the province. At least one Health Post Volunteer, and, where available, one Traditional Birth Attendant, have been trained for each of the province's 545 villages, making basic primary health care services and non-prescription drugs accessible to every villagers in the province. To assist the health post volunteers, groups of Health Communicators are also trained, one for every ten families, to provide a network of advice, referral and health information to every household. By 1979, 650 Health Post Volunteers 350 Traditional Birth Attendants, and 6,000 Health Communicators will have been trained.
4. Stimulating community and private sector involvement. This is a major emphasis in the development process. Community support has been actively sought through the formation of village health committees, which select the volunteers and provide local support once the volunteers are in place. Along with village level preparations have been efforts to involve private health care providers, such as druggists and private clinics, private sector organizations (such as Rotary and Lions Clubs) and others with important roles in village health care and development. Figure 7 summarizes the Lampang Project approaches.

II. THE LAMPANG SETTING

A. Area Background

Lampang is one of 16 provinces in the North of Thailand, located centrally within the region. Lampang has a population estimated at about 660,000 in 1978 in an area of 12,518 square kilometers (4,890 square miles). The population growth since 1970 has averaged 1.8% per year. The province has 12 districts,

FIGURE 7: LAMPANG PROVINCIAL HEALTH SYSTEM AND THE INPUTS OF THE LAMPANG HEALTH DEVELOPMENT PROJECT



75 sub-districts, and 538 villages. The provincial center, Lampang town, has a population of 50,000.

Lampang is located on the railway line between Bangkok and Chiengmai, and on the main highways linking Bangkok with Chiengmai and other major points in the northwest. The population is predominantly Buddhist and rural, the economy agricultural. Glutinous and non-glutinous rice are the main crops, along with other cash crops such as peanuts, pineapple, and sugar cane. Because of its location along communication arteries, processing plants related to agricultural production have also been established. There are major canning facilities for crops such as pineapple, and sugar processing plants. Another source of Lampang income comes from extractive industries such as timber, wolfram, tin, fluorite, and lignite. In one district of the province, a lode of lignite has been discovered, stimulating the development of a large power generating plant which uses the lignite supply as a source of fuel for running steam generators. There are also a variety of cottage industries producing wood carving, decorative weapons, and pottery.

B. Pre-Project Health Services

When the Lampang Project began field operations in late 1974, the provincial hospital had 300 beds, a staff of 22 physicians and 58 nurses, an average daily occupancy rate of 100%, and a daily out-patient load of from 300 to 500 patients. During the period of Project operations, a new, expanded Out-patient Department has been completed. As the Project started, there were district hospitals (previously called "first class health centers" and "district medical and health centers") in only three of the province's 12 districts, and only two of these had a physician in attendance. By 1978, there were five district hospitals, all with doctors and wechakorn assigned, and one more scheduled for completion in 1979. Twenty six of the province's 75 sub-district had a health center, staffed by a sanitarian and a midwife. In addition, there were midwifery centers located in 33 of the province's 538 villages. Within the provincial health office, there are also units for communicable disease control, venereal disease control, and epidemiology. There are also a malaria control unit, a regional sanitation center, a leprosy control center and a regional midwifery school also located in the health services complex. In addition to government-sector health services, there are at least 20 private MD clinics in Lampang town (staffed mostly by

hospital physicians in non-officials hours), and two private hospitals of 25-50 beds each. In the rural areas, there are a variety of indigenous practitioners, such as herbalists, injectionists, traditional birth attendants, magical and spirit doctors.

The services provided by each type of government health facility mentioned above can be summarized as follows:

1. Provincial Hospital: Basically curative health services are available with the primary specialties and a few subspecialties represented. Patients requiring more sophisticated care are referred to the teaching hospitals in Chiengmai or Bangkok. Male and female sterilization, as well as IUDs, birth control pills, and Depoprovera injections are available in the hospital's family planning unit.
2. District Hospital: Clinical care is provided for most acute illness and trauma episodes, minor surgery, along with short-term, acute inpatient care. It also provides the full range of maternal child health and family planning services, including vasectomy (in one district hospital), IUD insertion, pills, and Depoprovera injection.
3. Sub-district Health Center: Provides first-aid and emergency treatment for minor illness and injury, pre- and post-natal care, deliveries, child and school health, nutrition center services, family planning services, including pill and condom distribution, sanitation and environmental health (privies and small water supply).
4. Midwifery Center: Offers pre- and post-natal care, deliveries, family planning services, including pill and condom distribution.

C. Health Status of the Population

The community health survey conducted in 1975 established a baseline against which many of the objectives of the Lampang Health Development Project (LHDP) will be measured. It also provdes a picture of health status in the first experimental area brought into the LHDP (Hang Chat - E_1) and its two control areas (C_1 and C_2). One of the control areas (Mae Tah - C_1) is in

Lampang Province, the other, C_2, is in an adjoining province and will not be considered further here (see following Figure 8). About 20% of households, or 1,500, in E_1 were sampled. The comparable figure for C_1 was 10% or 1,100. The data to follow characterize some 100,000 people, or about 15% of the estimated 1975 population in Lampang Province.

Households in the two sampled areas were predominantly rural and mostly engaged in agriculture. Only 20-25 per cent were considered poor. Almost half the households had access to a water-seal latrine. Most families obtained their drinking water from shallow wells, half of them within their own compounds. Only 10 per cent took further steps to boil or filter their drinking water.

1. Illness

In the two weeks before the survey, 9 per cent of the sampled population claimed to have been ill. The most common symptoms were diarrhea, shortness of breath, painful or cloudy urination, stomach ache, fever, headache, cough and vomiting, in that order. Fifty-five per cent of illnesses did not last over 6 days. Fifty to 60 per cent purchased medicine directly, and only 27 per cent went to Government health facilities for diagnosis and treatment. The following table compares utilization data from a national sample in 1970 with areas E_1 and C_1 in 1975.

While much illness is self-limited, prolonged self-treatment or reliance on traditional healers, at times, may lead to more serious disease and disability by delaying the application of more appropriate medical care. While Government health services may be utilized more in area E_1, as compared to the 1971 national survey results, the absolute figure remains low. The finding that relatively few individuals sought care in the more expensive private sector suggests that the population in area E_1 has less access to this sector (confirmed by local observers) but also, as compared to the national sample, is less able to afford such care when ill.

FIGURE 8: GEOGRAPHICAL PHASING OF PROJECT IMPLEMENTATION

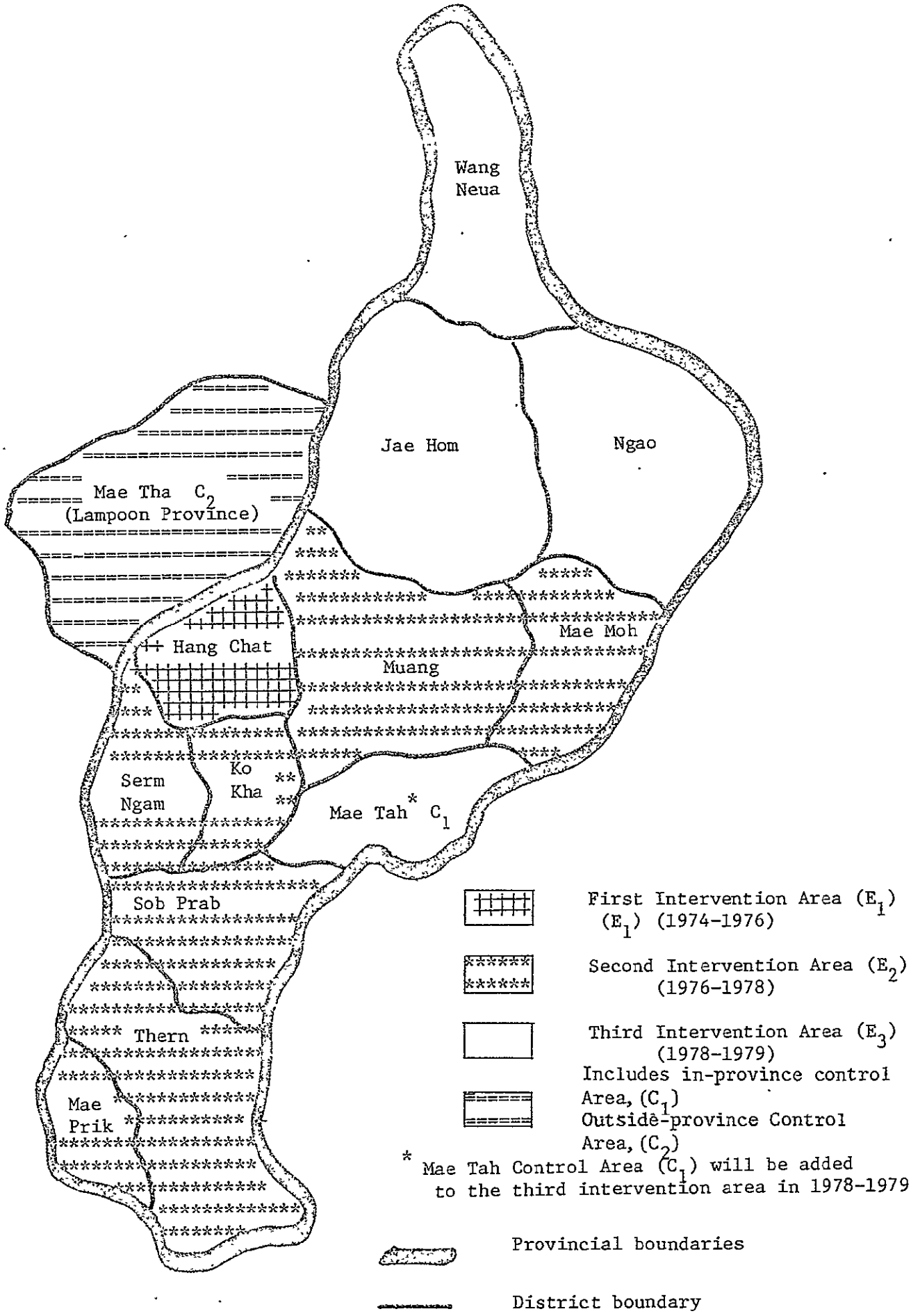


TABLE 1

Baseline Utilization of Health Services

First Place/Practitioner Chosen When Ill	% of Ill Persons Choosing			
	National Survey, 1970	Rural[a] North, 1970	E_1[b]	C_1[b]
- Purchased own medicine	51.4	52.7	50.5	61.0
- Private hospitals/clinics	22.7	7.1	8.7	7.3
- Government hospital	10.5	13.9	12.7	7.1
- Herbalists, injectionists traditional midwives and other local healers	7.8	17.4	8.8	10.9
- Government health centers/ midwifery centers/ clinics/other	4.9	6.5	14.2	10.7
- No care sought or no response	2.7	2.4	5.1	3.0
	100.0	100.0	100.0	100.0
All Government Health Facilities	15.4	20.4	26.9	17.8

Footnotes:

[a] Part of National Survey

[b] E_1 and C_1 data are from Community Health Survey, 1975.

2. Maternal and Child Health

Slightly over 75 per cent of all deliveries were supervised by trained personnel, although 45 per cent of these were at home. The majority of these women had had at least one pre-natal contact at the hospital or health center, but less than 10 per cent went for a post-natal examination. Sixty per cent underwent the traditional practice of post-partum "roasting"*, or lying by the fire,

*Roasting has been a traditional practice in which the mother and child are confined to a room for about a month, kept warm by a brazier of coals, and given an extremely limited diet - mostly rice-gruel and pickled vegetables. The practice is thought to hasten uterine involution and enable the mother and child to overcome the adverse effects to delivery.

and almost all went without vegetables or meat for the first post-partum month. It is widely believed that the post-partum mother should refrain from eating a variety of (frequently nutritious) foods in the belief that it will protect the health of suckling infants. Salted baked rice and pork-skin are the main foods permitted. While there is difference of opinion over some foods, some restriction of food is the practice even among younger mothers.

Analysis of the pregnancy history data revealed a 1974 infant mortality rate of 53.6 in area E_1, and 74.2 in C_1. Although the official national rate from reported deaths is 25, independent estimates from the Survey of Population Change, believed to be more accurate, suggests a rate between 75-80. Nutritional surveillance information for children under 6 indicates that 13-15 per cent may be second or third degree malnourished against a Thai weight-for-age standard. These findings in area E_1 are supported by independent data from other districts in Lampang Province.

3. Fertility and Family Planning

It is clear that fertility in Lampang has been falling rapidly since the late 1960s, well ahead of the rest of Thailand. Contiguous provinces, probably in response to vigorous family planning efforts, have shown an even more rapid fertility decline. All sources indicate crude birth rates in the vicinity of 20 per 1,000 and confirm that population age structure and changing marital patterns do not explain the decline in both E_1 and C_1. The national rate is currently estimated at 32. Over 50 per cent of eligible married women were currently using a method, most often the pill, in E_1 and C_1 in 1975. It is important to note the likely role of family planning in bringing married women in contact with government health services. As shown in Table 2, a much larger proportion of women used services than did children under 6, although both rates are relatively high.

Since it seems likely that other maternal and child health services are promoted through the strong interest in family planning,

integration of these services can further activate and extend the benefits to children.

TABLE 2

Proportion of Women (Age 15-44 years) and Children (Age under 6 years) Using Government Health Services in Areas E_1 and C_1

Target Population	E_1	C_1
Married women 15-44	54.6%	53.8%
children under 6	31.1%	31.1%

Date Source: 1974 Community Health Survey, LHDP.

D. Geographical Phasing of Project implementation

Project implementation was planned in three stages: the first phase (October 1974 to October 1976) covered one district (E_1), Hang Chat; phase two (October 1976-78), the seven districts of the sourthern part of the provinice (E_2) - Muang, Mae Moh, Ko Kha, Serm Ngam, Sob Prab, Mae Prik, Thern; the third phase covers in the remaining districts (E_3) - Wang Nua, Jae Hom, Ngao, and Mae Tah (C_1). E_1 contains about 7% of the province's population, and E_2 and E_3 contain about 60% and 33%, respectively.

The Project design is basically a quasi-experimental pre-test post-test type, with two control areas. In the Lampang operational area, there are three sequentially-phased experimental areas designated E_1, E_2, and E_3 for implementation, corresponding to the districts listed above. E_1 is a single district, E_2 comprises seven districts, and E_3 has four districts. Mae Tah is one control district (C_1) within Lampang Province (which will be the last district for implementation of Project interventions), and another control district (C_2) is in Lampoon Province adjacent to Lampang. The preceding map (Figure 8) shows the phased intervention areas and the two control areas.

III. ORGANIZATION, PERSONNEL, AND MANAGEMENT

A. Project Organization

To describe the Lampang Project organization is a complex task because Project personnel include existing staff members from the provincial health

organization, professionals assigned from other units within the Ministry of Public Health and other government agencies, as well as other technical and administrative staff hired specifically for the Project. Project field operations - delivery of services, training, supervision, management - are carried out by resident provincial health staff. Those who have come to the Project from the outside act as planners and stimulaters, helping to introduce and evaluate the new approaches that are the heart of the Lampang Project. In the final analysis, it is the provincial health organization that must deliver health services to the population of Lampang. The Project aims to make this process more pervasive, more efficient, more integrated, more community-oriented, and more affordable.

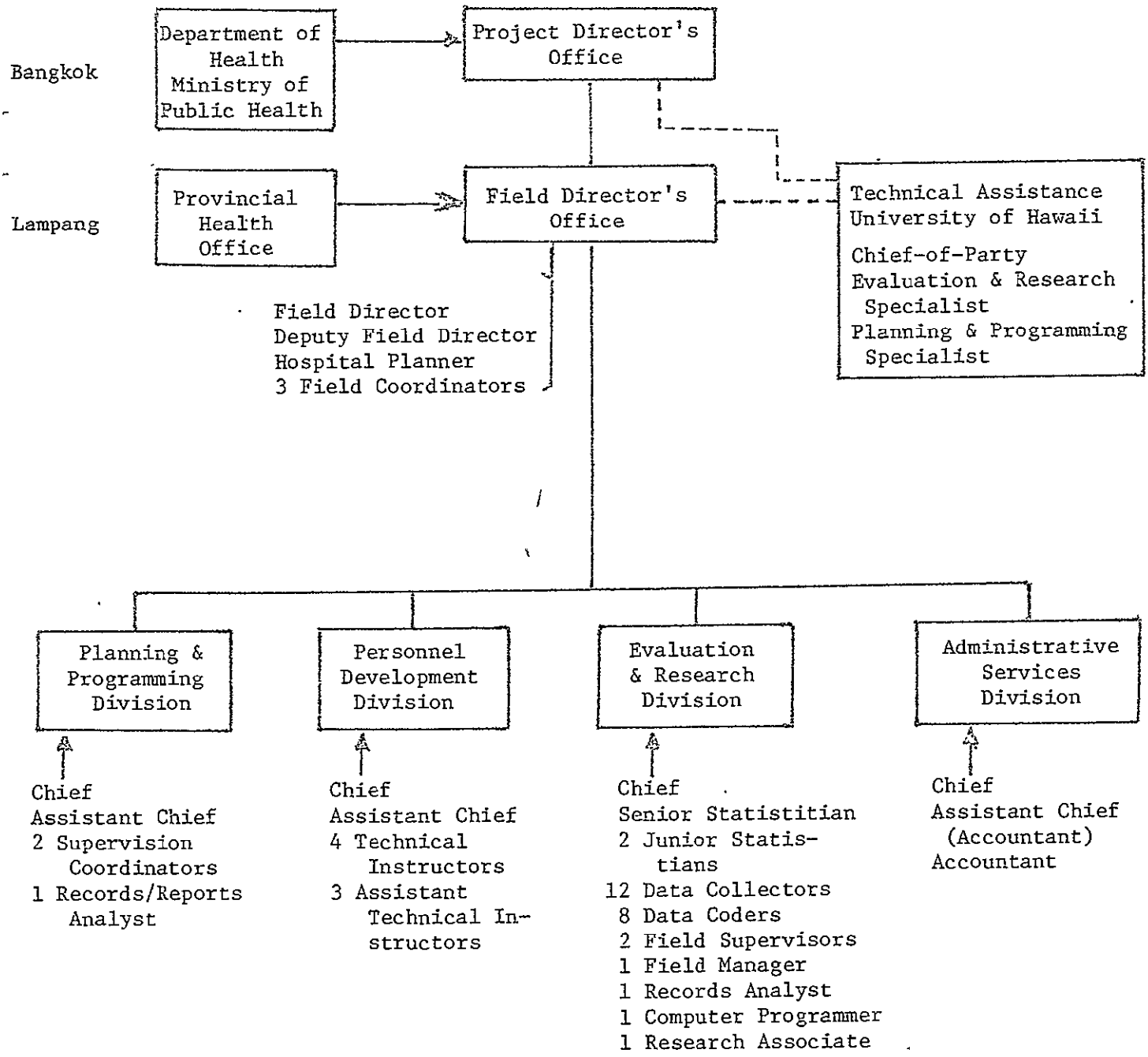
Once activity which is not normally a responsibility of the provincial health organization (and one for which it is not equipped) is project evaluation. Evaluation activities - surveys, data processing and analysis, etc. - are carried out by special evaluation staff with necessary coordinating support from the province. Project evaluation staff assist the provincial health staff in strengthening its own information and analysis systems.

The Lampang Project has been organized into a number of components to assist in Project implementation at the provincial level, and to coordinate support from the central ministry in Bangkok. Figure 9 outlines the general Project organization and staff. The Project Director is the Director-General of the Department of Health, one of the five departments within the Ministry. The Project Director takes responsibility for coordinating all support with the various agencies within and outside the Ministry of Public Health, and he has established a Project office within the Department of Health. In Lampang Province, the Project Field Director oversees Project operations at the provincial level, and all Project division chiefs report to him. Because the heart of Project operations is improved coverage and delivery of health services within the province, it was recognized from the outset that the Field Director must also be a senior provincial health official. Consequently, the Project Field Director has been the Provincial Health Officer from the outset of Project operation.

Under the Field Director are four Project Divisions: the Planning and Programming Division, the Personnel Development Division, the Evaluation and

FIGURE 9

Lampang Project Organization and Key Personnel



Research Division, and the Administrative Services Division. The Planning and Programming Division has responsibility for assisting the provincial health staff in planning and implementing the various modifications and innovative approaches in the Project. The small staff of five professionals have assisted health staff at all levels of the province in the selection of the paraphysician wechakorn, in organization of the village committees, in selection of village health volunteers, in stimulating participation from private sector groups, and in organizing programs of special emphasis, such as nutrition surveillance and services, and expanded family planning services. In short, the Planning and Programming Division has been responsible for assistance in planning all activities related to service delivery.

The Personnel Development Division, with a staff of training specialists, has responsibility for planning and implementing all training and orientations required to implement the various project approaches. This includes the design and development of the wechakorn paraphysician curriculum, organizing the training schedule in cooperation with the provincial hospital and other health facilities, and preparing all related training materials. It also includes developing a two-week training curriculum and field training programs for the health post volunteers and traditional midwives, and the two-day training sessions for the health communicators. In addition, the division organizes orientation programs for the various service and supervisory personnel at the provincial level, and implements a training-for-trainers program for those provincial staff who carry the burden of field training. The Personnel Development Division prepares all teaching materials and aids needed for each of the training programs, and draws on a wide range of experience available at other training institutions for assistance.

The Evaluation and Research Division has responsibility for monitoring Project progress and for measuring its impact on service delivery and on the health status of the target population. Because the demands of the evaluation process are unique and outside of the normal range of provincial health service activity (and will not be continued at the end of Project), the Evaluation Division has carried out its activities with its own personnel. Given its wide range of activities, the Evaluation Division has the largest staff of all Project divisions.

The Division of Administrative Services was set up to administer financial and administrative services. The Administration Division prepares the Project budget, oversees Project expenditures, controls fiscal and administrative procedures, and prepares all financial reports required by the donor.

In addition to the Project divisions, a technical assistance staff of three persons has been provided by the University of Hawaii School of Public Health. Three University of Hawaii faculty members work as integral members of the Project staff, providing technical consultation in the areas of planning and management, manpower development, evaluation and research. They also provide assistance in coordinating activities with other international agencies. The American Public Health Association has been assigned responsibility by the U.S. Agency for International Development for middle-level Project management and monitoring.

In addition to the Project and UHSPH technical assistance staff resident in Lampang, division chiefs may draw on outside consultants for special technical needs when required. The Evaluation and Research Division and the Personnel Development Division in particular have used outside consultants in carrying out their operations. Most of these consultants have come from institutions within Thailand, and, occasionally, consultants from abroad have also been invited.

B. Organizational Change and Integration

Although the Ministry of Public Health has nominally brought together the hospital and rural health services under one administrative unit (the Provincial Health Office), an effective system of cooperation and coordination at the provincial level has not yet been fully developed.

The Lampang Project has sought to establish a closer alignment between the curative hospital services and the preventive/promotive services of the rural health facilities. This process is essential, since the hospital is viewed as the nucleus for medical and health care in the province, providing leadership in training, technical support, as well as service delivery. As part of the design for reorganization, a Department of Community Health - Thailand's first department of this type in a provincial hospital - was established to provide a link between the hospital and rural health centers.

The Community Health Department's Mobile Health Clinic Program offers an illustration of the manner in which the provincial hospital and rural health care infrastructure can integrate their activities. The Community Health Department has established an ongoing program of mobile health clinics for serving remote communities throughout the province. The vasectomy service of the mobile clinic is the spearhead, although the clinic also brings other quality medical and health services to rural communities.

During the mobile clinics, continuing education for peripheral health personnel is provided by the participating hospital physicians. The wechakorn paraphysicians examine patients under the guidance of physicians, and many have improved their surgical skills by assisting physicians to perform vasectomies. The mobile clinics provide peripheral health personnel with opportunities to discuss management of local health problems, since many field supervisors do not have enough clinical experience to offer this type of advice. The hospital staff develop an appreciation of the health needs of rural villagers, and gain an understanding of the constraints under which their colleagues at rural facilities operate.

The training and supervision of the wechakorn paraphysicians has served to improve links between the hospital and the rural health centers. Most of the one-year training period is spent in the provincial hospital, first in the didactic, classroom phase, and then in the clinical preceptorship rotations. During the training period, the wechakorn trainees develop a strong relationship with their physician-instructors. Not all physicians in the provincial hospital accept the idea of training non-physicians in a broad range of clinical care, and some do not accept the added burden of training. However, recognition of the need for, and utility of, the new paraphysician is increasing because of the clear contributions made by the nurse-wechakorn who are assigned to the provincial hospital.

Introducing the wechakorn into the provincial hospital, the district hospitals and the rural health centers has broadened and strengthened the pattern of health care at each of these facilities. In the provincial hospital, nurse wechakorn are utilized in screening patients in the Out-patient Department, relieving the burden placed on the few physicians normally responsible for these services. Wechakorn also assist in the provision of routine care in the wards,

and in providing night call services. In the district hospital, one wechakorn is assigned to assist the physician. Seventy to seventy-five per cent of the wechakorn, however, return to health centers at the sub-district level, where there is no physician available.

The deployment of wechakorn to sub-district health centers seems to have brought the most dramatic change in health care at the sub-district level. Rural villagers previously utilized the sub-district health center minimally, knowing that competent clinical care could be found only at the district or provincial hospital. With the deployment of the wechakorn to the sub-district level, care for illness and other health problems, including expanded family planning services, is now available near the village.

Wechakorn paraphysician candidates are selected from existing health services personnel categories -- nurses, midwives, sanitarians, and nurse aides -- and given an intensive one-year of competency-based training that equips them to deal with most common health problems, as well as to recognize those more complex conditions requiring the attention of a physician. Although wechakorn continue to maintain their former responsibilities after they complete training and return to their assignments, the one year of competency-based training broadens and strengthens their role and responsibilities at their respective facilities. Their training enables them to diagnose and treat a wide range of the common health problems and illnesses found in the rural areas, utilizing antibiotics and other modern treatments. Their preventive and promotive service activities, formerly their main work, have also been expanded with training in insertion of IUDs and injection of Depoprovera, and in organization of community-based nutrition surveillance and service programs.

Another responsibility that has been added to the role of the wechakorn and other sub-district health center workers is supervision and technical support for the community health volunteers. At least one Health Post Volunteer is trained in each village to provide primary health care to his fellow villagers. For each Health Post Volunteer, there are approximately ten Health Communicators in a village. There is one Traditional Birth Attendant in approximately every two villages. The training and deployment of these three types of community

health volunteers is one of the Project's major thrusts in strengthening health care coverage in the rural areas, and in enabling the villagers to help themselves.

The important task of maintaining the morale and motivation of the volunteers, and of providing adequate technical and logistical support, belongs to the sub-district health center staff -- the midwife, the sanitarian, and the wechakorn. In an average sub-district, the health center has responsibility for 5 to 10 Health Post Volunteers, 50 to 100 Health Communicators, and about 5 Traditional Midwives. Each Health Post Volunteer should be visited, at a minimum, once a month to gather information on the volunteer's activities, to assist in solving any problems that may have come up, and to facilitate the resupply of household drugs. Although village volunteers are a promising path to improved health care at the village level, and represent better use of scarce health manpower resources, their required supervision and support adds new burdens to the role of local health workers.

The primary health care network of village volunteers is, on one hand, an extension of the government health care system, but on the other hand, is a community-based, private sector system organized to blend as smoothly as possible with the values, traditions, and lifestyle of rural villagers. There are important reasons for this approach. Not only does the Government currently lack the resources to bring health services to every village, and cannot do so in the near future, it appears that it is not necessary for the Government to reach every village itself. Recognizing that villagers in Thailand have a long history of reliance on their own ingenuity and resources without outside assistance, it seems reasonable that given some stimulation, direction, training, simple medical supplies, and reassurance, villagers can build on past tradition in meeting their basic health needs.

C. Community Support

To establish and maintain such a network of village health care requires a foundation of community support and participation. In the early planning stages, Project staff proposed that several types of committees be formed, or, if already existing, oriented to generate support at all key levels. The committees proposed were:

1. Village Health Committees
2. Sub-district Councils
3. District Advisory Committee
4. Provincial Advisory Committee

The Village Health Committee is one of the most important of the community groups. In each village, the former health committee, originally established to improve sanitation and water supply, has been reorganized, or a new committee has been formed. In practice, the village committee usually includes the village headman and other influential members of the village. The first step in the community social preparation process is establishing the committees as a means to provide initial orientation about the objectives and approaches of the Project, to learn of the community's health concerns, and to elicit their support and active participation. Local health center workers, in cooperation with Project staff, visited every village to organize the committees.

Once the committees were established, their first task was to identify and select the village health volunteers for their area. In the very early stages of Project operations, a sociometric survey method, was used to identify the volunteers, but though effective, it was found to be time-consuming, costly, and, therefore, too impractical for large-scale implementation. When given a specific task, such as volunteer selection, the village committees have been eager and cooperative. However, once the volunteers were trained and returned to the village, the continued role of the committee became less clear, and they became relatively inactive. Since the committee's continuing role has not been well-defined, committee members in more-recently intervened areas have been trained as Health Communicators, rather than selecting a separate group of villagers to carry out this function. This provides committee members with a clearer role, and draws more directly on their special influence in the community.

Sub-district Councils are a normal coordinating group established by the Government for the purpose of local administration. A Sub-district Council is made up of heads of Government units at the sub-district level, as well as influential citizens from the communities. Sub-district Councils are oriented by the Project, and have been instrumental in coordinating support from other Government sectors.

District Advisory Committees are made up of the local district officer and all heads of Government units, such as agriculture, community development, etc.. District Advisory Committees are crucial in coordinating Project activities in the respective districts. All health workers fall under the authority of the district officer, and clearance of the district officer and his staff is require before the Project can move into any given area. The District Advisory Committee's support for the Project is crucial, because it provides official sanction and needed cooperation for Project activities. The district officer and district facilities have been involved in training village health volunteers, and through the Committee, cooperation in programs such as nutrition have been secured from other key Government units, including agriculture, community development, and education.

The Provincial Coordinating Committee, headed by the governor and composed of all the heads of provincial Government agencies (including the Provincial Chief Medical Officer) and district officers, has been a mechanism for informing all Government units of the Project's goal and activities, as well as to seek advice in dealing with problems involving new approaches. Both governors assigned to Lampang during the Project's period of operations have been strongly supportive, and the Coordinating Committee has been a means for the governor to express and extend his support.

The clearest expression of community support is the participation of village volunteers themselves. Volunteers receive minimal incentives, and yet contribute their time and space in their households to serve their neighbors. The contribution must be both recognized and nourished by the Government health services.

Experience in the Project has indicated that the key elements in maintaining the volunteer contribution are regular supervision by local Government health workers and timely maintenance of the Health Post Volunteers' household drug supply. Where these two elements have lapsed, volunteer morale and performance have declined.

Finally, in the interest of mobilizing all available health resources, the Project has sought to involve private sector groups and individuals to the greatest extent possible. Traditional Birth Attendants have been utilized in every village where they are active. A number of the Health Post Volunteers

have previously been herbal practitioners, injectionists, or malaria volunteers. Many druggists - both in the village and urban areas - not only sell medicine, but also provide advice on diagnosis and treatment to their customers. The Project has secured the cooperation of many of the druggists in monthly reporting to the Provincial Health Office of certain specific illnesses they observe and their level of drug sales. In return, the Project has provided short training sessions for the druggists in appropriate prescription of the medicines they sell.

Recently, a Thai private sector organization, Community-Based Family Planning Services (CBFPS) has established a network of village volunteers, who primarily distribute contraceptives (oral pills and condoms), but who now also provide anti-parasite medications and some primary health care services. Community-Based Family Planning Services has paid particular attention to developing an effective management system, based on a paid district coordinator who works closely with the local district health officer, and a simple, rapid feedback reporting system. Their success in management has prompted the Project to invite CBFPS to implement its approach in one district of Lampang Province, to compare its results with the Project-implemented areas.

D. Management, Information, and Supervision

As the Lampang Project began operations, it had to grapple with the problems of inadequate management practices and a cumbersome information system within the provincial health organization. From the provincial to the district level, and from the district level to the sub-district health center level, supportive supervision - routine visits for problem-solving, on-the-job training, and feedback on performance - are infrequent and inadequate. Moreover, the provincial information system - including more than forty individual reports and records - is an unnecessary burden at all facility levels, and generates a huge amount of data which, even if up-to-date and accurate, seldom reaches decision points in a timely or useable form. As a result, information on performance of facilities and personnel is not often incorporated into the management decision process, and is not disseminated to appropriate decision points. At the same time, the flow has been generally uni-directional, with little feedback to the units generating and needing the information.

Although one aim of the Lampang Project is to resolve some of the management deficiencies, several Project features have served to intensify the management

demands on the service system. For example, creation of a new tier of health workers - the village health volunteers - adds a new management burden to the sub-district health center staff. Health center workers must now provide supervisory and logistical support, and gather information on a cadre who were not formerly under their responsibility.

Further, at the sub-district level, the addition of wechakorn paraphysicians introduces new demands for technical supervision and management. Midwives and sanitarians at the health center level are normally supervised and supported by senior sanitarians and midwives from the district and provincial levels. With their new clinical skills, however, wechakorn clearly require a different type of technical support than formerly provided. Specifically, they need technical guidance and continuing education from skilled clinical practitioners such as the doctor at the district health center, from physicians who trained them in the provincial hospital, or - at a minimum - from an experienced and skilled wechakorn.

The health center normally has a limited range of drugs, medical supplies and equipment, but to practice their new clinical skills, wechakorn must have a broader range of drugs, medical supplies, and equipment. This has placed new demands on the district and provincial logistics system. The wechakorn's expanded role in clinical care has also prompted improvements in the medical referral system from the sub-district health center to the district hospital, and from the district hospital to the provincial hospital.

Each sub-district health center staff assumes responsibility for overseeing the activities of six to eight Health Post Volunteers, two to three Traditional Midwives, and 50-80 Health Communicators in the area. A number of sub-districts do not have health centers, however, so that some health centers (in an adjacent sub-district) may have to assume responsibility for two sub-districts. In order to make the work more manageable, two or three health center workers divide responsibility for supervision geographically so that each may visit regularly only two or three volunteers. Health staff are expected to visit the volunteers at least once a month, when they review the Health Post Volunteer's log book and fill out a volunteer performance summary extracted from the daily log book.

The logistical mechanism for supplying the Health Post Volunteers with household drugs has changed during the course of the Project. Initially, Health

Post Volunteers were given a supply of the drugs from the health center which they could sell at a slight profit, using the returns to purchase resupplies. The local health worker was assigned the task of collecting the money and coordinating orders for resupplies through the Provincial Health Office, which in turn ordered supplies from the Government Pharmaceutical Organization. After the first year, it became apparent that the Government drug supply network was less effective than expected: health workers found it inconvenient to collect the funds and deliver the drugs, particularly when volunteers often did not have money available to repay the initial credit. At the same time, health workers did not always visit volunteers with sufficient frequency, due to seasonal communication difficulties, or other more pressing activities. These factors contributed to decreased volunteer performance.

To improve the supply network, the Project established an agreement with one of the major pharmaceutical suppliers in Lampang to order the household drugs directly from the Government Pharmaceutical Organization and take responsibility resupplying the volunteers through local drug outlets at the sub-district level. This arrangement has relieved the sub-district health workers of the burden of money collection and supply, but has not completely resolved the inconvenience for the Health Post Volunteer. He must now come to the sub-district to pick up his drug resupply. Transactions are on a strictly cash basis, which may be an obstacle to regular resupplies being purchased. With experience, managerial solutions have continued to evolve. Most recently, the Project added a district coordinator to assist the District Health Officer; one of his major responsibilities will be to support village health volunteers.

Support for wechakorn in the district and provincial hospitals present minimal problems, as the wechakorn work in close proximity to their physician supervisors, and can consult with them and receive in-serving training regularly. However, for wechakorn located in the more distant sub-district health centers, technical support is a crucial need. In districts that have physicians at the district hospital, clinical conferences are held when the helath center workers come to the district for the monthly staff meeting. It has been less feasible for the district hospital physicians to travel around to the sub-district health centers to provide on-the-job supervision and instruction, in part because of the demands on the physician at the district hospital, and also because the

district hospital has no officially-defined role in supervising sub-district health center activities. Another mechanism for providing technical supervision to the health center wechakorn has been the organization of provincial hospital clinical conferences each month by doctors who formerly trained the wechakorn. These have been useful in the early stages when the number of wechakorn was small, but as more wechakorn complete training, the increasingly larger number will make such conferences less convenient to hold. There is a clear need - and an expressed request from the wechakorn themselves - for individualized, extended technical supervision at their work sites, but this need has not yet been adequately met on a routine basis. A number of former wechakorn instructors, hospital staff from the Community Health Department in the provincial hospital and Project trainers, have made sporadic but useful follow-up visits to health center wechakorn. A more formal supervision system is under consideration, perhaps using a senior, skilled wechakorn.

Supplies and equipment needed by the wechakorn at their health centers was a problem for first group of wechakorn, because, as former midwives and sanitarians, they had not been authorized to order to use, for example, antibiotics or insert IUD's. Although there had been an orientation for provincial senior staff concerning the role of wechakorn, when the first group completed its training, there was still some confusion about what they were authorized to do. For example, a few provincial staff members questioned supplying the wechakorn at the health centers with a new line of drugs and equipment. This problem has, for the most part, been resolved through continued discussion and clear demonstration of competency by the wechakorn.

In order to facilitate the management process and monitor Project progress, Project and provincial staff have worked together in an attempt to lighten the burden of the existing information system, and to streamline the information system to make it more useful and effective. Village health volunteers were not previously part of provincial health care, and therefore, a system of reporting on their activities needed to be established. Given the fact that volunteers are not Government employees, only minimal demands for reporting could be made on them. Consequently, each Health Post Volunteer is trained to keep a daily log of service contacts, which includes information on the contact's name, age, sex, reason for the contact, treatment prescribed, and payment for any drugs dispensed.

The health worker from the local sub-district health center visits the volunteer each month and abstracts data from the daily log for use in a monthly volunteer activity reporting sheet, which is then compiled for each district. The monthly district report summarizes the total number of services contacts for illness care, total family planning acceptors and contacts, the number of family planning supplies distributed, and the amount of money collected for drug sales. The volunteer reports are then sent to the Provincial Health Office (and to the Lampang Project Evaluation and Research Division) for routine monitoring. The Evaluation and Research Division periodically analyzes and summarizes volunteer performance and distributes a report to the Provincial Health Office and related Project divisions. Information on the performance of the traditional midwives and village health communicators is not routinely gathered.

The Project has made efforts to streamline the routine reporting system by deleting items that are of marginal use, but there has been considerable resistance to these attempts both in the provincial health office and at the Ministry level. The Programming and Planning Division, along with the Evaluation and Research Division, have routinely reviewed the monthly reports coming in from the various rural health facilities, and have extracted data which are relevant to routine monitoring. These data, which summarize performance of the various health facilities by category of activity (e.g. family planning, maternal child health, nutrition, and illness care) are distributed to Project and provincial health decision makers. The burden of reporting on peripheral health staff has, therefore, not been reduced substantially, but specific information items from these reports have been selected to make relevant information easily accessible to Project and provincial staff for management decision making.

In addition to information from routine reporting mechanisms, the Evaluation and Research Division, as part of its overall project assessment and evaluation function, has carried out a number of surveys which provide baseline information on health status and health service utilization. These data have been useful in identifying the level of health status and health service problems, in pinpointing their location, and in identifying where program emphasis should be placed. For example, one important result of baseline surveys was the recognition that the nutrition problem in Lampang Province is more serious than had been originally assumed. The Community Health & Nutrition Survey detected high

levels of malnutrition and also identified the areas of greatest prevalence. Figure 10 outlines the various information sources and channels of flow.

VI. EDUCATION AND TRAINING OF HEALTH PERSONNEL

Under the overall planning and supervision of the Project Personnel Development Division, pre-service, in-service, and refresher training and education have been provided for a variety of Government health personnel and Government health volunteers. These programs are the following:

- Training of Wechakorn
- Training of Health Post Volunteers
- Training of Health Communicators
- Training of Traditional Midwives
- Training of Trainers
- Training of Administrators and Supervisors
- Training of Service Personnel

TABLE 3

Summary of Lampang Project Training Activities

Training Category	Length of Training	Number Trained as Of August 1978	Estimated Number yet To be Trained	Total Trained at End of Project
Wechakorn	1 year	96	30[a]	94
Health Post Volunteers[b]	2 weeks	572	100	672
Traditional Midwives	2 weeks	244	100	342
Health Communicators	2 days	4,846	1,000	5,846
Trainers	2 weeks	133	--	133
Supervisors and Communicators	1 week (half days)	72	--	72
Service Personnel	1 week	195	75	270

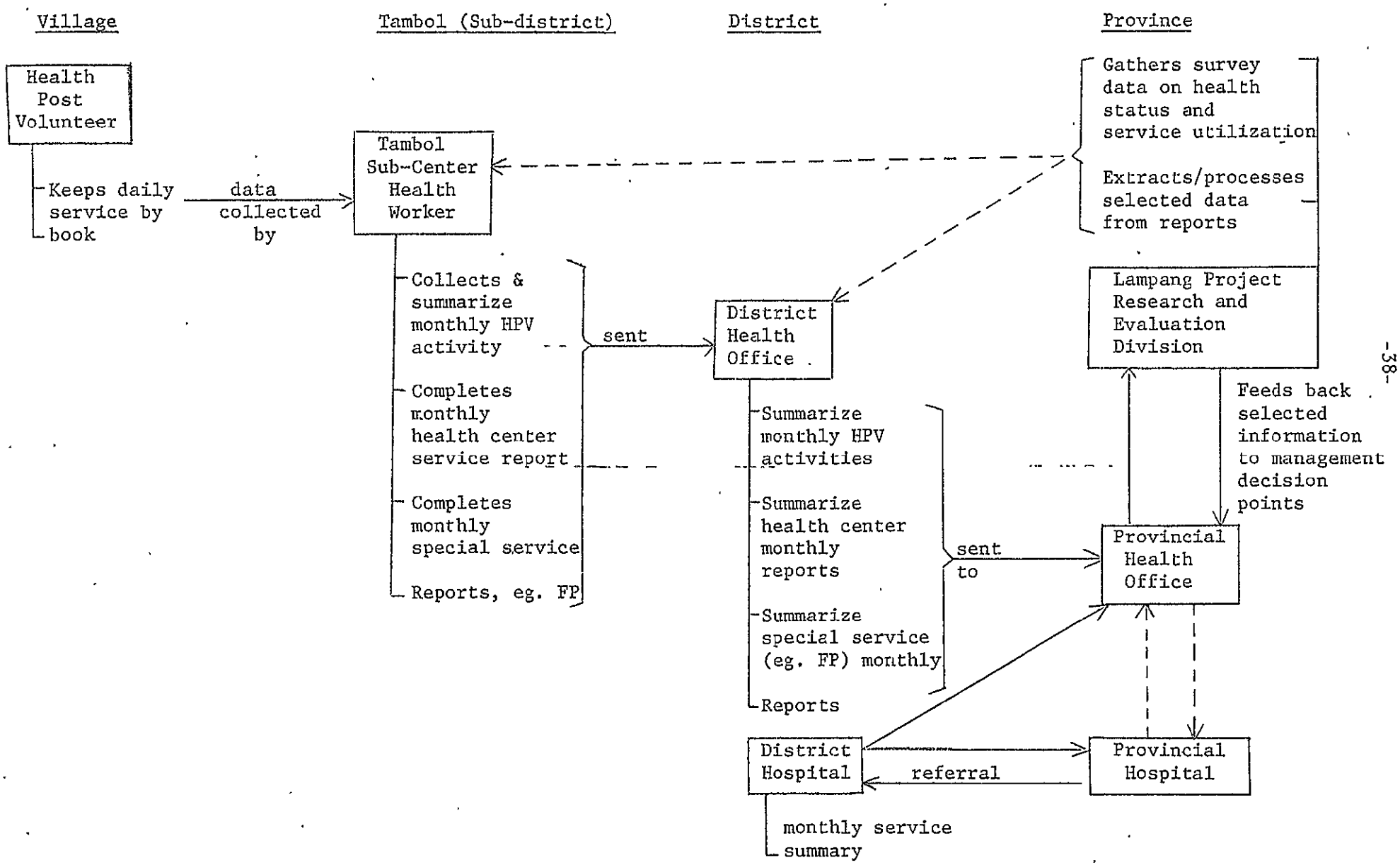
Footnotes:

[a] The fourth group of 30 began training in 1978 and will finish in May, 1979.

[b] Includes 50 volunteers trained by Community-Based Family Planning Services in Ngao District.

FIGURE 10

HEALTH INFORMATION SOURCES AND CHANNELS OF FLOW



AVAILABLE

A. Wechakorn Training

The role of the wechakorn is to greatly expand the provincial and district hospital's capability of dealing with routine medical care patients, thus giving the physician time for more serious or complicated cases, and to extend competent clinical care to the rural health centers, which has previously been unavailable to the rural population. Along with the greatly expanded curative care capability which they add to Government health care facilities, the wechakorn in peripheral health facilities at the district and sub-district level also have broad responsibility for community health promotion and disease prevention programs. The wechakorn's training equips him/her to take a strong leadership role among the health center team, and to establish a relationship with the village health volunteers that is crucial to providing effective health care coverage in the area. After completion of the one-year training course, the wechakorn is able to:

1. provide medical care for patients suffering from common illness and injuries by using available resources under the physician's overall responsibility;
2. recognize cases that are beyond his capability, refer patients, and consult physicians as necessary;
3. supervise the health center team members;
4. administer the health sub-center and assist in clinical and administrative work in the district hospital; and,
5. promote and guide community health development programs.

The training approach used for wechakorn is problem-oriented and the methods are competency-based. The methods of training wechakorn were adapted from the MEDEX model, which originated in the United States during the late 1960's. The short one-year duration requires that theoretical and classroom material be minimized, and practical clinical experience be maximized. Emphasis is on "learning by doing". As a result, the training course is divided into two major phases: the didactic or classroom phase, which lasts 16 weeks, and the preceptorship, or practical clinical phase, which lasts 36 weeks. The classroom, or didactic phase, is broken up into a series of discrete units, employing problem-oriented modules. Each module is a self-contained learning unit, which includes a pre-test and post-test, learning objectives, and the substantive materials

that the trainees must learn before successfully completing that module. Various modules, which are the basis of the classroom sessions, may require from a day to several weeks to complete. Since the physicians in the provincial hospital have the major role in training wechakorn, they were invited to participate in preparing the modules and other training materials. With initial assistance from the Health Manpower Development (MEDEX) Staff of the University of Hawaii, Provincial Hospital and Project staff worked together to write and refine the modules and the other materials for the training curriculum. The current content of training and time required for wechakorn is as follows:

1. Core Skills:	
1.1 History taking and medical terminology	30 hours
1.2 Physical examination, anatomy and physiology	60 hours
1.3 Laboratory examination	30 hours
1.4 Use of formulary	6 hours
1.5 Introduction to comprehensive health care	6 hours
1.6 How to use protocol	6 hours
2. General Clinics:	
2.1 Skin problems	30 hours
2.2 Ear, Eye, Nose and Throat problems	30 hours
2.3 Chest problems	30 hours
2.4 Abdominal problems	30 hours
2.5 Genito-Urinary/Kidney, Ureter, Bladder Problems	30 hours
2.6 Diarrhea/Vomiting/Dehydration	12 hours
2.7 General problems	30 hours
3. Emergencies	84 hours
4. Maternal and Child Health	
4.1 Maternal and Child Care	
4.2 Family Planning	
5. Community Health and Field Supervision	
5.1 Nutrition problems	30 hours
5.2 Prevention	30 hours
5.3 Vital Statistics	18 hours
5.4 Community Health Education	18 hours
5.5 Supervision	12 hours

Twenty-nine weeks of the 36-week preceptorship are spent in the provincial hospital, rotating among the various departments, both in-patient and out-patient, as well as on night duty. Working under close supervision of physicians in the departments, wechakorn learn to take histories, examine patients, diagnose problems, and prescribe the proper treatment. Protocols guide the learning process for the wechakorn by providing simplified decision chains which systematically present the steps in dealing with a patient presenting a given problem (or set of problems), in order to arrive at a diagnosis and prescribe proper treatment, or to know when to refer the patient to a physician if necessary.

In addition to the 29 weeks of hospital rotations, wechakorn spend four weeks working in community health development at the rural health center level, one week in community health resource planning, and another two weeks for electives in the hospital. At the end of the training program, each wechakorn trainee is given a written and practical test, and faculty members from various medical schools throughout Thailand are invited to act as the examiners. During the practical examination each wechakorn is given a series of patients to examine, diagnose and prescribe treatment, and their findings and actions are judged by the panel of medical school faculty.

Some difficulty was anticipated, and encountered, in jointly training individuals with different backgrounds and educational levels. This was partially overcome by pseical refresher sessions to bring everyone to a standard level. At the end of training, there were no significant differences between the final test scores of the various trainee categories.

Over half of the wechakorn are women -- midwives, nurses and nurse-aids. The following table summarizes the backgrounds and final assignments of the wechakorn.

TABLE 3

Wechakorn Background And Final Assignment

Background	Number Trained	Wechakorn Location After Training			
		Rural Health Center	District Hospital	Provincial Hospital	Other
Nurse	14	--	2	10	2
Midwife	51	49	2	--	--
Sanitarian	25	24	1	--	--
Nurse Aide	4	2	--	--	2
Other	2	--	--	--	--
TOTAL	96[a]	75	5	10	4

Footnotes:

[a] 92 wechakorn are in Lampang Provincial assignments. Two nurse aides and two Border Policemen were sent for training by special requests. The fourth, and last, group of 30 wechakorn are currently in training, scheduled for completion in May, 1979.

B. Health Post Volunteers

The Health Post Volunteer is the focal point of primary health care in each village. One volunteer is chosen in each village, or more than one in large villages that are widely dispersed. The rural volunteer is trained to:

1. provide simple first-aid and illness care to his fellow villagers, using non-prescription household drugs provided by the Government;
2. refer more complicated cases to the local health facilities;
3. support community nutrition surveillance and nutrition service programs;
4. advise villagers about family planning and distribute pills and condoms;
5. inform mothers and children about services provided by local health facilities;
6. distribute (in a few areas) drugs for malaria, tuberculosis and leprosy patients who might be living in the village;
7. support and supervise the health communicators in the village; and,

8. coordinate Government activities with local villagers.

The training course for groups of 25 to 30 Health Post Volunteer lasts ten working days, or two weeks. Through a series of lectures, discussions, and practical activities, trainees are given instruction in the recognition and care of minor diseases; in recognizing which types of people should be referred to other health facilities for care; in recording births, deaths and migration; in making the daily log; and in supervision and community motivation. Training is usually arranged at some facility close to the volunteer's home, normally at a village temple, school, or other Government facility.

Training is carried out by health workers and other Government officials in the area where the volunteers are located, assisted by provincial and Project training staff. The materials used are prepared by the Lampang Project training staff in the Personnel Development Division, and at the end of training, each volunteer is given a Health Post Volunteer manual which can be kept in their homes for easy reference.

Health Post Volunteers are provided with an initial supply of household drugs on credit, at a discount. They sell the drugs at a slight profit, then pay back the cost of the consignment and purchase a new supply. Thus the Health Post Volunteers gain a small amount of income from their work, but it is usually quite nominal ($5-10/month only). In addition, the Health Post Volunteer and his family are provided with free medical care at the health center and provincial hospital. To date, 572 of the approximate total of 670 have been trained.

At least once each month, the local health worker visits the volunteer to help in problem solving, technical and logistics support, and to gather information from the daily logbook for inclusion in the monthly volunteer performance report. One day of on-the-job refresher training is provided each year for Health Post Volunteers, the village committee, and local health personnel so that problems can be dealt with jointly.

C. Traditional Midwives

Traditional Birth Attendants, or "granny" midwives - almost all women - still deliver a majority of the children born in rural areas and attend to pre-

and post-natal care. Because they are usually older and closely involved in family affairs, they have great influence in the village. Traditional midwives are selected in every village where one is present if they are not over 60 years of age. In some areas that are well-served by Government health facilities, the number of traditional midwives has been decreasing, with the result that only one midwife could be identified and recruited to serve two villages. In groups of about 25 trainees, the traditional midwives are trained at the Lampang Regional Midwifery School for a period of two weeks. During the course of the training, which is carried out by Project and Midwifery School staff, the trainees learn to:

1. give advice to mothers and children in using health services from local health facilities;
2. detect abnormal pregnancies and refer them to health centers, or the district or provincial hospital;
3. do normal deliveries using aseptic technique;
4. advise mothers and children about good nutrition;
5. give minor medical care using household medicines;
6. distribute pills and condoms and encourage villagers to practice family planning; and,
7. record births and report them to the Health Post Volunteer or village headman.

The content of the two-week curriculum is as follows:

Introduction of participants	1/2 hour
Pre-test (question and answer method)	1/2 hour
Introduction to Lampang Project	1 hour
Sanitation and personal hygiene	1 hour
Mother and child health	25 hours
Family planning	4 hours
Household medicines	1 hour
Recording of births	1 hour
Integrated health service in the district and role of the Traditional Birth Attendants	2 hours
Sterile technique	3 hours
Nutrition for mothers and children	3 hours

Patient referral system	1 hour
Introduction to Child Nutrition Center	1 hour
Post-test (question and answer method)	1 hour
Observation at antenatal clinic, well baby clinic and obstetric ward at Lampang Hospital	9 hours

The general content of the training is presented in demonstrations, role playing, and lectures incorporating the use of models, pictures, movies and slides.

Traditional midwives are entitled to free medical care at the local health center, district and provincial hospital. They are normally supervised by the Government midwives in the local health center, and receive refresher training once a year. Two hundred and forty-two traditional midwives have been trained by the Project as of mid-1978, and it is expected that approximately 100 more will be trained by the end of the Project.

D. Training of Health Communicators

Health Communicators are the third type of village health volunteer developed by the Lampang Project. One Health Communicator is chosen for about 10-15 households, making a total of about 10-15 communicators for each village. The role of the Health Communicator is to promote the services of the local Health Post Volunteer and the local health center. They also receive and disseminate health information among the households which are assigned to them, under the overall supervision of the Health Post Volunteer.

The Health Communicator candidates are selected by the Village Committee, and sent to a training center near their home, usually a temple, a school, or other local public building, in groups of 50-75. They receive two days of training, which includes the following topics:

Introduction to Lampang Project	1/2 hour
Functions of the Communicator	1/2 hour
Nutrition	1 hour
Maternal and child health	1 hour
Family Planning	1 hour
Observation of the occurrences of common communicable diseases	1 hour

Local health service system	1 hour
Household medicine	1 hour
Human relations	1 hour
Receiving and disseminating health information in a village	1 hour
Sanitation	1 hour
Child Nutrition Center	1 hour
Cooperation with the Ministry of Interior	1 hour

Teaching is done through small group discussions and lectures, supplemented with handouts, posters, models and slides. Although communicators receive no monetary incentives for their work, free medical care is provided for the communicator at the health center and district hospital. Each year, Health Communicators receive one day of refresher training. As of mid-1978, 4,846 communicators were already trained, and about 800-1,000 more will be trained before the Project is completed.

E. Training for Administrators and Supervisors

All administrators and supervisors from the Provincial Health Office and the provincial hospital, including physicians, chief nurses, dentists, pharmacists, district health officers and supervisors of the Provincial Health Office received one week of orientation training to:

- understand the Project goals and approaches;
- orient them to the operation of integrated health services, and indicate how this will effect them;
- orient them to the importance of their roles and of others on the health team.

The training is completed in five half-day sessions to reduce the time that senior staff must be away from their responsibilities. Follow-up on-the-job training for one day is also provided twice each year.

F. Training for Service Personnel

All staff who provide services at the provincial hospital and district hospital, health centers and midwifery centers are given one week of training to orient them to the Project's goal and methods, and to demonstrate how the

Project approaches will affect them in their individual jobs. Most of the people who receive the training are nurses, laboratory technicians, dental hygenists, junior health workers, midwives and practical nurses. On-the-job training is provided, in addition to routine supervision.

G. Training for Trainers

A two-week training program was organized for all provincial health staff who assist in training village health volunteers and in orienting service personnel. Trainer trainees learn classroom teaching methods, curriculum and lesson plan preparation, use of teaching and audio-visual aids, and organization of training programs. The course is held at a teacher training college in a nearby province, and was run by the college staff and Project staff. The content of the training is as follows:

- Orientation
- Principles of Teaching
- Psychology in Rural Health Development
- Sociology and Human Relations
- Public Speaking
- Technology of Teaching
- Good Community Teacher
- Role of Mass Communication in Public Health Work
- Teamwork of Group Process
- Organization of Training Programs
- Practice for Teaching
- Evaluation for Training Programs

H. Project Advisory Committees and information Dissemination

In order to orient and publicize the approaches and methodologies of the Lampang Project, and to gain support in problem solving and resource assistance, several advisory committees have been established within the Ministry of Public Health and in other sectors of the Government. The first of these committees is the Lampang Project Policy Committee, composed of high-level Government policy-makers and planners from a variety of relevant ministries and agencies. The Policy Committee, chaired by the Under-Secretary of State for Public Health, reviews Project progress and current constraints about twice yearly, and provides advice and assistance in facilitating Project operations. Members of

the Policy Committee include representatives of the National Economic and Social Development Board, Department of Technical Economic Cooperation, Civil Service Commission, Bureau of the Budget, Ministry of Interior, Ministry of Public Health, Bureau of State Universities, and various faculties of medicine and public health.

Another high-level advisory committee is the Lampang Project Executive Committee, composed of representatives from various departments and divisions within the Ministry of Public Health. This committee, chaired by the Project Director (Director-General, Department of Health), provides technical advice and support to Project staff in resolving issues that can be dealt within the Ministry of Public Health. It is also a mechanism for keeping various units within the Ministry informed of Project progress.

At the provincial level, the Provincial Coordinating Committee mentioned earlier, chaired by the Governor of Lampang Province, and comprising the heads of all Government departments in the province, along with all district officers, coordinates support at the provincial level, and is a vehicle for keeping all provincial units posted on the progress of the Project.

In each district, a District Coordinating Committee, chaired by the District Officer, and participated by heads of all district government units, performs advisory and coordinating functions at the district level.

All of these committees serve to publicize Project activities to the widest possible audience. Another major vehicle for reporting the Project's progress, and for gaining advice and recommendations from a wide variety of interested parties, is the Project's Annual Review. Annual Reviews have been held each year since 1975, serving as a forum for presenting Project progress to date, discussing problems encountered, seeking effective solutions, and for productive discussions in dealing with salient issues. The Annual Review is attended by representatives from most Government and non-Government agencies with an interest in health and rural development, including agencies represented in the Project Policy Committee and Executive Committee, and other Government and international agencies.

Another important vehicle for Project information dissemination is the exchange visits that have occurred since the beginning of the Project and which continue with increasing frequency. A number of Project staff have been requested as consultants to other projects and programs within and outside of Thailand. Project staff have assisted the government of Korea and the government of Pakistan in their efforts to build basic health care programs similar to that of the Lampang Project. A number of Project staff have attended international and domestic workshops, seminars, and meetings to make presentations related to the Project. The Lampang Project is now receiving several hundred visitors each year, from nearly every continent, and representing a wide variety of government, non-government, and international agencies. The large number of visitors have been useful mechanism for generating interest and support for the Project around the world.

V. SERVICE COVERAGE

The Lampang Project, as described earlier, has grafted new health services onto an existing health network. In 1974 this system in Lampang consisted of a provincial hospital, 5 first class health centers (now district hospitals), 26 sub-district health centers and 33 village midwifery centers. Compared to average national population coverage, Lampang has been relatively deprived. Figure 11 shows 1978 coverage.

TABLE 5

Geographic and Population Coverage by Government Health Facilities and Service Personnel in Thailand and in Lampang Province

Health Facilities and Personnel	Thailand (1973)	Lampang (1972-3)	Lampang (1978)
Health Centers			
Districts covered	45%	33%	64%
Sub-district covered	57%	35%	74%
Village covered	4%	6%	
Hospital Beds	91/100,000	48/100,000	45/100,000
Personnel			
Physicians	9/100,000	3/100,000	NA
Nurses	20/100,000	9/100,000	NA
Midwives	9/100,000	10/100,000	12/100,000
Sanitarians	7/100,000	5/100,000	7/100,000

Since 1972-3, major changes in coverage have occurred in Lampang Province through support of the Ministry of Public Health. Two additional district hospitals have been built and all 5 district hospitals are now staffed with physicians and wechakorn. There are now 61 sub-district health centers, all staffed with wechakorn, increasing geographic coverage to 74 per cent of sub-districts. Concomitant increases in personnel have followed this new construction. Finally, the provincial hospital will soon acquire regional status, thus doubling its bed capacity and increasing greatly its staff. Table 6 shows the change occurring between 1974 and 1978.

In general preventive care has been emphasized at the peripheral units (village and sub-districts) and curative care at the center (district and provincial capital). Figures 2 & 3 illustrated the existing geographic mix of disease prevention, health promotion, and illness care services, and the integrative changes instituted by the Lampang Project. A clear aim is to bring curative services closer to the villages. The main approaches are the development of wechakorn and the development of village health volunteers.

Wechakorn are prepared to offer a variety of preventive and curative services, including treatments for wounds, infections, and common diseases of the skin, respiratory, gastro-intestinal and genito-urinary system. The wechakorn is responsible for carrying out immunizations and nutrition surveillance of pre-school children in the villages of their areas.

The wechakorn, as well as the rural health center midwives, sanitarians, and the new assistant district health officer, are expected to support the village health committees and village volunteers. The Health Post Volunteer is prepared to provide general advice, simple first aid, and a limited supply of medicines. The Health Post Volunteer also carries a stock of oral contraceptives. A small profit is allowed from the sale of medicines as an incentive. The Traditional Birth Attendant (TBA) is expected to improve her delivery service (with a higher skill level after her two week training course) and to send referrals to the Government midwife when necessary. She is asked to report births to the HPV and is trained to offer advice in nutrition and family planning. The Health Communicator is intended to function as a family advisor in health matters and to report to the Health Post Volunteer as prescribed. Health

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TABLE 6

Numbers of Government Health Service Units and Government Health Personnel

1974 and 1978 [a]

Year	Number of			Number of Service Units			Number of Government Personnel					Personnel added by Proj. Implementation			
	Dis-tricts	Sub-districts	vil-lages	District Hospitals	Health Centers	Midwifery Centers	MD	N	NA	MW	S	W	HPV	VHC	TBA
1974	11	75	538	3	26	33	2	3	–	58	30	–	–	–	–
1978	12	75	538	5	61	26 [b]	5	7	17	78	44	47	572	4846	244
1979 [c] (est.)	12	75	538	6	65	NE	6	NE	NE	NE	NE	75	672	5846	342

[a] Does not include provincial hospital

[b] A number of midwifery centers have been upgraded to health centers

[c] Completion of Project installations

MD = physician N = nurse NA = Nurse Aide MW = midwife S = sanitarian

W = wechakorn HPV = Health Post Volunteer VHC = Village Health Communicator

TBA = Traditional Birth Attendent

NE = No Estimate Available

communicators have also proved useful in recruiting villagers to attend the mobile clinics of the Community Health Department. At the village level, however, simple preventive and curative care are not partitioned as sharply as this account might suggest.

The Community Health Department has provided mobile health service in Lampang Province since October 1977. Although this service was not envisioned in the original Project plan, it is an outgrowth of the Project's philosophy of integrating health services and this contributes to Project coverage and impact. While the main emphasis is performing vasectomies, the mobile team also conducts a general out-patient clinic and provides immunizations at its bi-weekly sessions

Mobile Clinic Services (October 1977-August 1978)

- Vasectomy, 950, mean number of living children 3.1
- Immunizations, 3,600; mostly cholera and typhoid
- General out-patient visits, 6,500 (women > men 2:1, 28% women 15-44, 17% children 0-6)

Provincial Hospital Well-Baby Clinic (June-August 1978)

- 1,217 children < 6 (2,100 immunizations, mostly OPV and DPT)

Physicians from the provincial hospital and senior wechakorn travel with the mobile team to provide clinical services, and to give supervision to rural wechakorn who join the mobile team in the field. The village volunteers have been mobilized to assist mobile clinic services with particular reference to vasectomy services. It is clear that the mobile clinic has improved the quality of contraceptive practice by promoting vasectomy acceptance in rural areas. Most of the patient visits are by women for common, mild ailments. These are handled largely by the participating wechakorn. The well-baby clinic at the provincial hospital, under the control of the Community Health Department since May 1978, is now likely to expand and more firmly established disease prevention and health promotion services within the hospital.

VI. IMPACT ON SERVICE DELIVERY AND HEALTH STATUS

The basic evaluation design for the Lampang Project involves sequential implementation of integrated primary health care by area, E_1, E_2, and E_3, with

two control areas, C_1, in Lampang Province, and C_2, an adjacent district in Lampoon Province. The principal means of measuring subsequent changes in health status, in addition to ongoing Ministry of Public Health service statistics and selected other independently-collected data bearing on Lampang, are (1) baseline and follow-up cross-sectional community health and nutrition surveys, (2) separate and periodic analyses of administration, tasks, and costs, and (3) special studies. Evaluation studies of various aspects of impact are scheduled over a seven-year period. Since the Project is now in its fourth year, many of the cross-sectional studies have not been repeated yet. Initial surveys provided a baseline data base and revealed some unexpected findings suggesting the need for certain program changes. They also provided useful checks on the quality of selected service statistics in the early years of the Project. Ongoing longitudinal information suggest some early changes in health care utilization that may be due to the Project.

A. Village-level

Once the Health Post Volunteers were trained and supplied, a pattern that emerged quickly was a surge in service contacts (primarily, distribution of medicines and oral contraceptives pills), followed by a decline and a slowly rising trend. The pattern shown in Hang Chat District (E_1) and Muang District (E_2) in Figure 12 is typical.

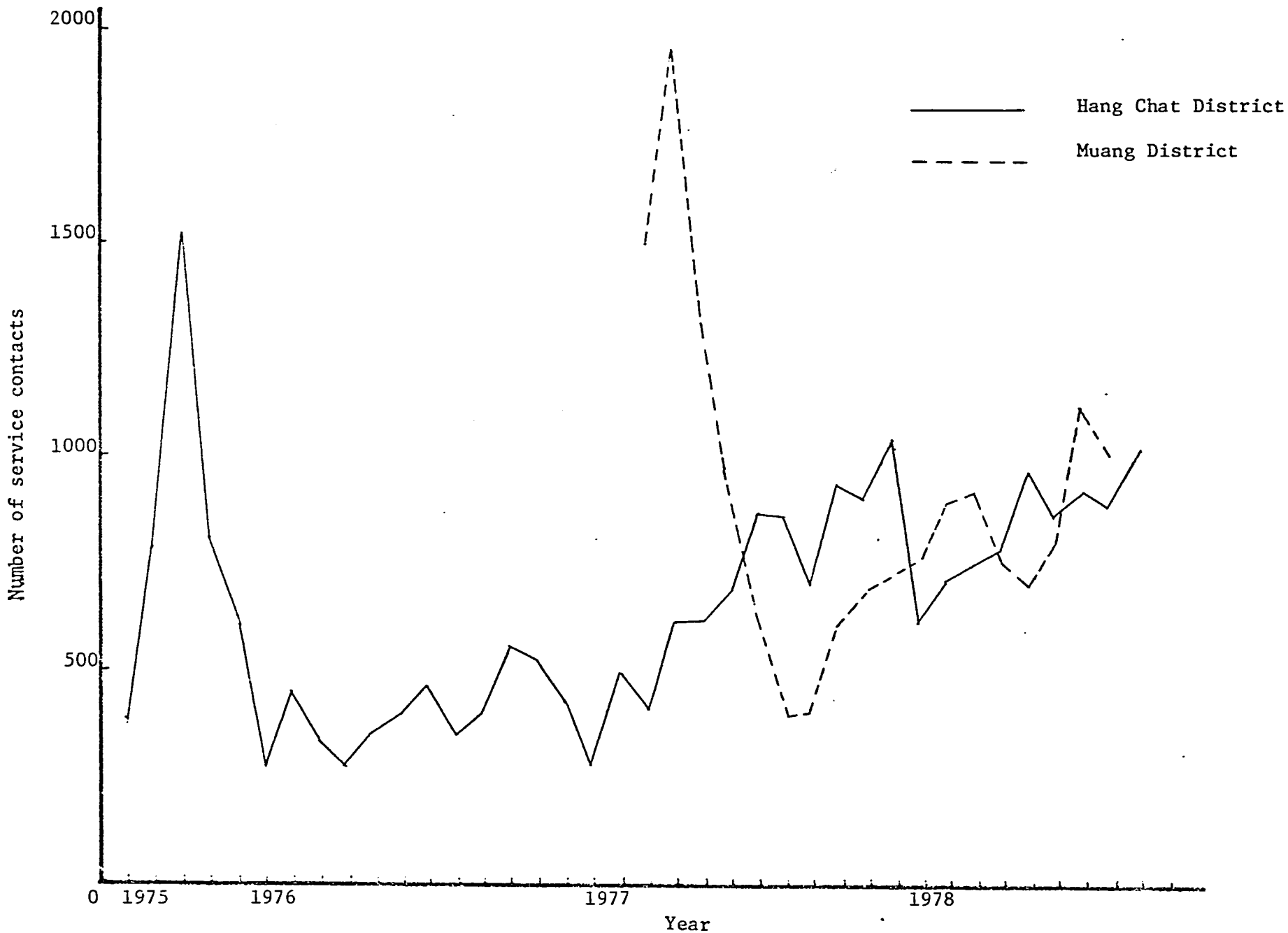
In the first year of deployment Health Post Volunteers in E_1 provided services to 13-38% of all villagers seeking care, a clear gain.

There have been problems in keeping the Health Post Volunteers re-supplied, and in maintaining high morale through routine supervision, but most continue to function even if at a slightly lower level than at first. When supervision has been regular, performance has been good. Some Health Post Volunteers, living in villages near rural health centers, have been by-passed. Other Health Post Volunteers who work away from their houses for most of the day may not be available to provide optimum service. Follow-up studies of Health Post Volunteers indicate their interest in more first aid training and higher monetary incentives.

While data are not routinely collected on communicator activities, the Health Communicators appear to be relatively inactive, possibly because of

FIGURE 12

Health Post Volunteer Service Contacts
in Hang Chat District (E_1) and Muang District (E_2)



uncertainty over their role and lack of clear direction from the village health committees. Beyond the expressed desire for more curative services at the village level, the voice of the village health committee is unclear, perhaps reflecting the historical passivity of villagers in their relationship to Government. While it seems that the Health Communicators will not be useful in improving the reporting of vital events, they have been usefully mobilized in support of the field activities of the Community Health Department, and they may help invigorate child nutrition activities.

The role of the trained Traditional Birth Attendant seems limited to pregnancy (and its prevention), delivery, and post-partum care. Beyond carrying out these activities at a higher level of skill than before, under the wechakorn and/or Government midwife supervision, and accounting for a targetted 35% of all deliveries (see Table 8), they seem relatively inactive. As with the Health Communicators, it is clear that the Traditional Birth Attendants have not been helpful in improving the reporting of vital events.

B. General Health Services

One of the objectives of the Lampang Project is to extend appropriate health services to at least 65 per cent of the target population. Table 7 presents estimates of the distribution of general illness care services by location for residents of Hang Chat (E_1) 1974-77. The targets are estimates of the proportion of total visits that are appropriately handled at the specific levels of the extended health care system. The clear emphasis is in extending care to the village - or near the village - while simultaneously expanding the capacity of the whole system to provide integrated basic health services, including illness care for the approximately 2 illnesses per person reported in the Community Health Survey.

As a new category of worker, Health Communicators contributed no service data for 1974. The fall-off in general medical care visits to Health Post Volunteers from 1975-76 was anticipated by the earlier discussion and figure showing their monthly performance. Similarly, the gain in Health Post Volunteer service contacts is observed in 1977. The sharp gain in health center visits, continuing into 1977, reflects the presence of wechakorn. The targetted 65 per cent Government service utilization should be reached in 1978. A similar gain

TABLE 7

General Illness Care Services to E_1 and C_1 Populations by Location of Serive 1974-1977

	Location of Service	Targets		Visits and Per Cent Distribution							
				1974		1975		1976		1977	
		Visits	(%)	Visits	(%)	Visits	(%)	Visits	(%)	Visits	(%)
A	Provincial Hospital	4,230	5	6,177	7	3,836[a]	4	6,827	8	6,148	6
R	Health Centers	21,149	25	15,968	19	13,011[d]	15	22,168	26	34,672[f]	40
E	HPV	29,607	35	[a]	--	10,103	12	4,872[c]	6	8,387	10
A	Sub-Total	54,986	65	22,137	26	26,950	31	33,867	40	49,207	56
E_1	Others, including Traditional healers	29,608	35	--	74	--	69	--	60	--	44
	Estimated Total Episodes	84,594	100	84,594	100	85,578	100	86,562	100	87,544	100
	Provincial Hospital	5,727	5	NA	--	7,403	7	9,263	8	10,159	9
A	Health Centers	28,637	25	NA	--	7,130	6	10,020	9	11,892	10
R	HPV	40,092	35	NA	--	--	0	--	--	--	--
E	Sub-Total	77,456	65	NA	--	14,533	13	19,283	17	22,051	19
A	Others, including Traditional healers	40,092	35	--	--	--					
C_1	Estimated Total Episodes	114,548	100			115,132	100	115,716	100	116,300	100

Source: All data are from Provincial Service Statistics NA= Not Available

[a] No Health Post Volunteers were in place in 1974.

[b] Based on Community Health Survey, 2 significant illnesses per year were assummed to require attention. The Project target is to attend to 65% of these illnesses with a concentration of care at the village or near village level.

[c] It was observed that (HPV) activity subsided after the first 6 months, but then held steady.

[d] It seems possible that use of the health centers fell in 1975 since many of their key personnel were in training to become wechakorn.

[e] This figure seems too low, perhaps representing an undercount, failure to register addresses at hospital visits, or an artifact of projecting data for the last 5 months of 1975 to a full year.

[f] The newly-built District Hospital was only open for 9 months in 1977.

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should be observed in future years in area E_2 as the services of the new district hospitals attract clients. The C_1 control area does not reflect either the volume or rate of increase in service utilization during comparable periods.

While the estimates of visits to the provincial hospital seems low for 1975, the trend through 1977 indicates a relative and absolute decline in utilization by residents of Hang Chat. Given the nearness of Hang Chat to the Lampang Municipal Area and the projected expansion of provincial hospital capacity, it may be difficult to keep this trend from increasing [illegible] future years. On the other hand, provincial hospital utilization by C_1 residents actually increased in the comparable years for which data are available.

TABLE 8

Deliveries to Hang Chat Women (E_1) by Location of Supervising Personnel, 1974-77

Location of Supervising Personnel	Target Distribution	(%)	Deliveries 1974 No.	(%)	1975 No.	(%)	1976 No.	(%)	1977 No.	(%)
Provincial Hospital	--	25	263	26	296	32	297	33	267	30
Health Centers[a]	--	35	166	18	196	21	176	19	394[e]	44
TBA (trained)	--	35	NA	39[b]	331	36[c]	239	26	204	23
Sub-Total		95		(Est.83)		90		79		97
Others		5	NA	(Est.17)	91	10[d]	191	21[d]	27	3
TOTAL		100	924	100	914	100	903	100	892	100

Footnotes:

[a] Supervision by the trained midwife at the health center or at home.
[b] Community Health Survey, 1975. Proposition of Hang Chat women with 1974 births supervised by Traditional Birth Attendants.
[c] Home births supervised by TBAs trained by the Lampang Project (estimated 75% of total number in villages). Figures for last 5 months of 1975 projected to whole year may be too high.
[d] Calculated by exclusion. Thought to be too low in 1975 and too high for 1976.
[e] Delivery totals for 10 months projected to 12 months.
[f] Birth projected from estimated populations of 42,000 to 43,500 from 1974-77. Birth rates estimated to fall from 22.0-20.5 per 1000 over the same period.

NA = Not available

C. Delivery Services

A close look at available service statistics (Table 8) suggests that the desired target of having 95% of deliveries supervised by trained health personnel was reached shortly after Project implementation began in Hang Chat (E_1). However, the relative distribution of supervised births did not follow the targets.

While there is instability in some of the numbers, and projected births may be incorrect, it appears that the provincial hospital's share of deliveries is unduly high and may not be decreasing significantly. The presence of the wechakorn seems to have increased dramatically the proportion of deliveries supervised by them or the trained auxiliary midwives at home or at the health centers in 1977. The trained TBAs seem slowly to be loosing ground, confirming a trend that has been observed over the past several years.

As mentioned earlier, the expansion of the provincial hospital and also the training needs of the Lampang Midwifery School may make it difficult to restrict access to the provincial hospital to only those women referred in with pre-natal complications. Trainees will need to see normal deliveries in substantial numbers.

D. Nutrition

The emphasis of the Lampang Project in addressing the health needs of pre-school children has been mentioned. Nutritional Status in this vulnerable population group is of special concern, and now more so with the availability of baseline data from areas E_1 and E_2. Despite some differences in research methodology - (1) surveillance in E_1 and part of E_2, Community Health Survey in the E_2, and (2) different weighing scales - the results are remarkably similar in describing the prevalence of more secondary and tertiary undernutrition.

Clearly 10-15% of pre-school children in E_1 and E_2 are moderately or severely malnourished - and another 30-40% milder undernourished. This finding was a surprise. The undernutrition problem was not formerly recognized at the health policy level, as judged by the findings of the Cost and Task Analyses in E_1. There, only 4% of the total budget was spent on nutritional activities in 1975-76. The coverage of pre-school children by the Child Nutrition Centers in Hang Chat (E_1) is estimated at no more than 5%, and many who do attend Child Nutritional Centers may not actually need special nutrition care.

TABLE 9

Nutritional Status of Pre-School Children in Hang Chat (E_1) District and 6 Other Districts (E_2) in Lampang

Nutritional Status Classification[a]	Per Cent[b]		
	E_1[c]	E_2[d]	E_2[c] (Muang District)
Normal	56	45	47
Primary undernutrition	31	44	37
Secondary undernutrition	11	10	12
Tertiary undernutrition	2	1	3

Footnotes:

[a] Gomez weight-for-age against Thai standard

[b] Because of rounding, percents may not equal 100

[c] Surveillance data, N=4,000

[d] Community Health Survey, sample of all six E_2 districts, N=1,500

Having identified a group of severely malnourished children, an effort was made to have HPVs and wechakorn follow these cases and supply regular supplemental food. The results of the first six month followup are shown in the following table.

TABLE 10

Followup of 3° Malnourished Children in Hang Chat (E_1) 1977-1978

Children Identified as 3° Undernourished by Nutritional Surveillance[a]		Number	Per Cent
Misclassified[b]		6	8
Died before followup		3	4
Iproved[b]			
to 2° status	5	20	25
to 1° status	3		
Unspecified	12		
Unchanged		32	42
Unknown[c]		16	21
Lost to followup		0	0
TOTAL		77	101[d]

Footnotes:

[a] Nutrition surveillance in 1977 estimated that 2% of Hang Chat children under 6 were severely (third degree) malnourished on a weight for age basis against a Thai standard.

[b] A minimal estimate of misclassification and improvement. See footnote c.

c It is known that some of these 16 children improved while others were misclassified. The exact numbers are unknown, however.

[d] Due to rounding, may not total exactly 100.

Misclassification was expected considering that much of the weighing was done by less-well trained HPVs. While information is incomplete, it appears that less than half, and possibly as few as one-quarter of the children improved over the period. It should be emphasized that although some improvement was seen, many such children still remained malnourished. A few children died and the largest single group were those whose status was unchanged. The notes of the follow-up workers make it clear that many HPVs were not fully cooperative and some wechakorn were unable to take an active role. Half the children who received supplements did so at home, the balance coming to the health center. In only two of seven health centers was staff performance considered to be satisfactory. Where food supplements were delivered or collected, the child was much more likely to improve.

These results must be judged disappointing. Since the improvement of child nutrition is a priority of the Project, new approaches may need to be devised to stimulate the villages to recognize the problem (perhaps through the dramatic recovery of a severely malnourished child in the village) and to activate the HPVs (perhaps by means of an incentive in selling supplemental food). Ultimately, food supplements should be locally made, pointing to a possible role for the private sector. Finally, the role of health education to train mothers how to prepare local foods properly, and to decrease the role of superstitions, needs expansion through HPVs and HCs, and to be reinforced by restimulated wechakorn. There may well be a role for a trial of mother's clubs in some villages to carry out continuous surveillance and to promote better nutritional practices.

E. Family Planning

The baseline Community Health and Nutrition Survey in E_1 and C_1 indicated very high levels of current family planning practice before Project interventions were introduced. With a current contraceptive prevalence rate at 50% and above, it would be difficult to foresee a large increase in acceptance. Follow-up data on current family planning practice will not be collected until the Community Health and Nutrition Survey is carried out at the end of Project in 1980.

However, family planning service statistics do provide some evidence of how Project activities may be affecting family planning acceptance. Table 11

summarizes family planning new acceptor data for the period of Project operations in E_1, and C_1 areas.

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TABLE 11

New Family Planning Practice Acceptors in E_1 and C_1, 1974-1977

Service Location	Method	1974 E_1	1974 C_1	1975 E_1	1975 C_1	1976 E_1	1976 C_1	1977 E_1[a]	1977 C_1
Provincial Hospital	Sterilization M/F	75	NA	76	72	69	76	37	69
	IUD	127	NA	78	142	66	179	70	125
	Injection	--	NA	1	--	2	--	4	3
	Pill	24	NA	33	65	62	71	32	78
	TOTAL	226	NA	188	279	149	321	143	275
District Facilities	Sterilization M/F	1	NA	--	--	--	--	187	--
	IUD	1	NA	--	--	--	--	10	--
	Injection	--	NA	41	--	207	--	251	--
	Pill	476	NA	574	819	799	791	801	816
	TOTAL	478	NA	615	819	1,006	791	1,339	816
TOTAL - Hospital + District		704	NA	803	1,098	1,205	1,212	1,482	1,191

Footnotes:

[a] Data for Hang Chat District Hospital are for 9 months, the period the facility was newly opened.

NA = Not available

The data show an increase in the overall number of new acceptors in each of the two areas during the four years data are available. However, the proportionate increase between 1975 and 1976 in E_1 jumped to 50% from 19% in 1974, whereas in C_1, the corresponding increase was only 10%.

If the hospital data are separated from the total new acceptors, the pattern of acceptance at the district level is striking. Whereas in E_1, there

was a 49% increase in new acceptors at the district level between 1975 and 1976, and a 33% increase from 1976 to 1977, there was a 3% decrease in the control area for the same period. There was also a slight decrease in hospital new acceptors who came from Hang Chat. Although conclusions must be tentative, the sharp increase in in new acceptance in E_1 seems to correspond with the introduction of wechakorn and community health volunteers. Furthermore, the proportion of new acceptors travelling to the provincial hospital for services has decreased in Project operational areas, but has actually increased in the control area. This suggests that the expanded availability of family planning services at the district level may have attracted the new acceptors, reducing the need to use the provincial hospital.

Another important family planning activity is the mobile vasectomy clinic organized by the Provincial Hospital's Community Health Department. Health professionals in Thailand have commonly assumed that rural men with low income and education are not interested in vasectomy. However, once the mobile clinic began operations in October 1977, there was a surprisingly vigorous response in most of the areas where the service was introduced. In the year since the mobile clinic began, over 1,000 men have received a vasectomy. Another finding of interest is that a majority of the acceptors are poor farmers, with four or less years of education, and with three or less children. The impact of this clinic on the pattern of family planning acceptance can be seen in Table 11. In 1977, sterilization (almost all vasectomy) became a much more important method than in years past - a result of the mobile clinic in E_1.

VI. COSTS AND RESOURCES

A frequent criticism of special demonstration projects is that they produce excellent results and impact, but frequently employ methods that the implementing Government cannot afford to replicate and institutionalize in other parts of the country. As the Lampang Project began, emphasis was placed on analyzing the extent that additional resources would be required for the Government to incorporate the Project's key features into the health structures of other provinces. At this point in the Project, a comprehensive analysis of costs and outputs is not complete. However, some general findings concerning resource inputs and Project inputs can be outlined including:

-- Provincial health system costs
-- Contributions from outside sources
-- Estimate of additional resources required to replicate the Project's key features in a province
-- Cost breakdowns for implementation in a single district.

Table 12 summarizes the provincial health care system costs for the four years the Lampang Project has been in operation.

TABLE 12

Annual Provincial Health Costs 1974-75 Through 1977-78 (in U.S. dollars) By Functional Category

Year	Capital Costs	Operational Costs				
		Personnel[a]	Expendable Supplies	Other[b]	Total operational Costs	Annual Total
1974-75	$ 571,538	$ 425,252	$ 359,730	$ 111,460	$ 896,442	$ 1,467,980
1975-76	822,070	622,731	502,442	111,548	1,236,721	2,058,791
1976-77	2,038,713	658,329	1,545,136	336,598	2,140,062	4,178,775
1977-78	2,285,971	1,040,971	1,321,119	480,778	2,851,664	5,137,635
4 Year Total	$5,718,292	$2,756,079	$3,728,427	$1,040,384	$7,124,889	$12,843,181
Yearly Average	$1,429,573	$ 689,020	932,107	$ 260,096	$1,781,222	$ 3,210,795

Source: Lampang Project Planning and Programming Division for 1974-76
Provincial Health Plan for 1976-78

Footnotes:

[a] Personnel costs include salaries, wages and overtime.

[b] Other costs include travel, per diem, and allowances, matching funds central funds, and miscellaneous.

Table 12 presents the budget figures as they are categorized in the standard Government accounting system. During the period of Project implementation, there has been a heavy capital outlay for the expansion of the provincial hospital and construction of several new rural health facilities. Consequently, about 45% of the total budget for the four years is in the capital costs category.

In order to get a better picture of actual provincial service costs, Table 13 presents only operational costs by service location, i.e. provincial hospital and district health facilities. It can be seen that the bulk of provincial health service costs go to the provincial hospital, and that rural health facilities operate on small budgets. This is understandable, to some extent, because the most highly-trained and highly-paid personnel are concentrated in the provincial hospital, and the types of services available there are more sophisticated, and, consequently, more expensive.

TABLE 13

Annual Operational Costs by Geographic Location (Capital Costs Omitted)

Year	Provincial Hospital	District Health Facility			Total
		E_1 District	C_1 District	Other 9 Districts	
1974-75	$ 642,399	$ 24,601[a]	$ 19,681[a]	$209,761	$ 896,442
1975-76	889,244	31,589[b]	31,589[b]	284,299	1,236,721
1976-77	1,015,109	102,268	102,268	920,416	2,140,062
1977-78	--	--	--	--	2,851,664

Footnotes:

[a] E_1 and C_1 district costs obtained from Cost Analysis Baseline Survey.

[b] E_1 and C_1 figures derived by dividing total rural health budget by 11, the number of districts.

Segregation of individual district costs from the aggregate provincial health budget was done as part of the Project's Cost Analysis Study, but data are only available for the baseline year 1974-75. Therefore, district costs for 1975-78 are not included as such. But since provincial hospital costs and total provincial health costs are known, average district health service costs can be estimated. The average district health service costs for 1975-78 are estimated by dividing the total operational budget for provincial rural health activities by the number of districts (11) in the province. This is admittedly a rough figure since the size and available facilities in the eleven districts are uneven.

To ascertain what additional costs beyond the normal provincial health resources might be required to implement the key features of the Lampang Project, a first step would be to review the level of outside contributions. Table 14 summarizes annual outside assistance to the Project over the past four years. A large proportion of the research and development, demonstration, and evaluation costs are non-repetitive, as are technical assistance costs. For example, almost all of the special evaluation activities, mostly supported by outside resources, are directed at measuring Project results, and would not be continued elsewhere.

TABLE 14

Annual Non-RTG Donor Contributions to Lampang Project
1974-75 Through 1977-78

Source	1974-75	1975-76	1976-77	1977-78	Total
APHA	$366,599	$366,599	$627,000	$627,000	$1,987,148
UHSPH Technical Assistance	114,526	189,589	256,219	260,210	820,544

APHA = American Public Health Association

UHSPH = University of Hawaii School of Public Health

After careful examination of the assistance contributions, approximately 11% of the total, or $298,072, would be required as additional inputs to implement the key features in other provinces. This amounts to an average annual addition to the provincial health operational budget of $74,693 for each of the four years.

For the first four years of the Project, adding the outside inputs mentioned above, or $74,693, would increase the total annual provincial budget by about 2.5%. This would be about 4.2% of the annual operational budget. But these additional resources have brought basic health care coverage to about 70% of the province in the first four years, and has improved the quality of those Government services already available. This increase seems well within the financial capabilities of the province, as the operational budget has been increasing, on the average, 46% annually during the four years of Project operations.

Reviewing overall budget allocations does not give a detailed and accurate picture of what it actually costs to implement the Project key features. A better method would be to examine the costs of developing and implementing major Project components, despite the fact that detailed cost estimates are rought at best.

One important component Project implementation is the cost of training the various personnel categories. In 1976, the estimated costs of training each of the Project's innovative health worker categories were as follows:

Health Post Volunteer	= $124/person
Health Communicator	= $ 17/person
Traditional Midwife	= $112/person
Wechakorn	$2,000/person

These early estimates of training costs for volunteers are probably higher than current costs because the subsequent training for trainers program prepared local health workers to assume volunteer training responsibilities, reducing the higher-cost input of Project Personnel Development Division staff. Training the first group of wechakorn was expensive, with an estimated average cost of over $6,000 per trainee. It is important to recognize, however, when trainee costs for the first group were computed, all of the substantial start-up costs were included. Start-up costs included heavy investments in developing the training, initial purchases of training equipment and supplies, and extensive technical consultant costs for those assisting in developing the program. However, wechakorn training costs have benefitted from economies of scale, leading to a trainee cost that has stabilized at about $2,000. If the training costs in a single district are compiled, and adding the other inputs needed to implement integrated health services, some measure of required additional resource inputs can be estimated. For example, in Hang Chat, the first operational district, implementation costs which have been incurred in addition to the normal Government budget are presented in Table 15.

Since all implementation was done in a two-year period in Hang Chat, training costs are divided between two years. When comparing the total inputs related to Project implementation with the average annual district health budget of about $28,000, the inputs seem very large. But the major portion of the added costs are for training, which would not normally be borne by the district itself.

Furthermore, training costs are an initial ivestment, which, being non-repetitive, are quite small when pro-rated over the life-span of service contributed by health workers.

BEST AVAILABLE

TABLE 15

Two Year Project Inputs in Hang Chat District (1974-1976)

Cost Category	Two-Year Costs	Average Cost/Year
HPV Training		
(a) 75 x $124/trainee = $ 9,300	$ 9,300	$ 4,650
Communicator Training		
(b) 652 x $ 17/trainee = 11,084	11,084	5,542
Traditional Midwife Training		
(c) 44 x $117/trainee = 5,148	5,184	2,574
Wechakorn		
(d) 7 x $2,000/trainee = 14,000	14,000	7,000
Total Training Costs (Sum of above (a+b+c+d)	$39,532	$19,766
Supervision ($5/day x 4 days/month	4,160	2,080
Supplies/Materials ($250 x 7 centers	3,500	1,750
Total Additional Inputs	$47,192	$23,596
Estimated Government District Health Budget	$56,190	$28,095

VIII. CONCLUSIONS AND LESSONS

In the fourth year of the Lampang Project, with interventions well underway but with evaluation activities incomplete, where does the Project stand with regard to achievement of the major objectives? What has been learned? What experience has been translated into Ministry policy and plans for primary health care and integrated health services? Any appraisal must be incomplete and tentative, based only on a baseline survey, fragmentary longitudinal data of uneven quality extracted from routine provincial records, and the qualitative, but

knowledgeable reports of many experienced observers. It must be constantly kept in mind that the Project seeks to expand, permeate and redirect a well-established system of health services and to pioneer a new pattern of relationships rather than organize a self-contained system of health care.

The major goal of the Lampang Health Development Project is to improve the health status of the population of Lampang. It is assumed that the goal will be reached if the Project successfully achieves its specific implementation objectives, which are:

1. To expand health care coverage to at least two-thirds of the rural women in child-bearing years and pre-school children.
2. To establish an integrated model of provincial health service delivery extending to the sub-district level and linked to a village health volunteer network established in every village.
3. To establish an integrated health care system that is "low cost", ie. more cost-effective, the key features of which are within the resources of the RTG to replicate nationally if found effective.

Evaluation objectives include the measurement of consumer accessibility to and acceptance of services in the experimental and control areas, an assessment of the performance of health personnel and the efficiency (through improved management) of the health delivery system, the measurement of the impact of services on the health status of the population over time (as compared to specific targets) and, lastly, an assessment of the financial, social and administrative feasibility of replicating the key features introduced by the Project.

A series of questions bearing on the Project's objectives will serve as a useful frame for this preliminary appraisal:

A. To what extent can integration of illness care, disease prevention, and health promotion services, as well as Government and private health sector health services, actually be attained?

The Lampang experience suggests that more integration can be achieved, despite the historical separation of "medical care" and "public health" services. The administrative reorganization by the Ministry of Public Health in 1974-75

placing all provincial hospital and health services under a Provincial Health Officer helped to expedite the goals of the Project. But even more important, perhaps, in reorienting attitudes are the manpower development and role changes instituted by the Project. While wechakorn training is necessarily mostly clinical in orientation - to relieve the heavy demand for illness care at the hospitals as well as to bring clinical services closer to the villagers - community health skills are also emphasized. The wechakorn typically comes from a rural health center, where the preventive/promotive orientation is strong, and returns after clinical care and community health training with a renewed commitment to the preventive/promotive services stressed by the Project -- maternal and child health, family planning, and nutrition.

In an underserved rural population oriented to episodic, medical crises, the risk is that preventive services will be submerged by the demand for curative care. The risk is clearly lowest for family planning, which, because of the high demand and continuing interest at highest governmental levels, has been well-integrated in the provincial health services for some time. The risk may be highest for nutrition, which is not widely recognized as an important problem by the people, and is confounded, much as family planning once was, by a maze of traditional myths.

A major contribution of the Project to integrated health services is the organization of the Community Health Department at the Provincial Hospital. While this Department is not yet permanently established, there is every indication that it will be soon. Hospital physicians rotating from other departments, go out with the mobile unit into the rural areas to provide curative and preventive services and supervise the work of the rural health centers. This rotating activity will expand in the future. At the central level the Department provides a focus for preventive services at the hospital, and has absorbed a number of preventive functions and staff from the Provincial Health Office.

"Integration" of the private sector in an overall Government-coordinated health care system will be more difficult. Private pharmacists have been cooperative in resupplying medicines to the HPV, but they were approached only when the Government system was unable to provide needed supplies in a timely manner. The private Community-Based Family Planning Services has organized a district (Ngao)

in the northern region of Lampang. Since 1975, Community-Based Family Planning Services has been very successful in organizing private sector family planning services in many parts of Thailand. They are expanding their program on a pilot basis in Lampang to include provision of simple medicines, health education, and perhaps community nutritional surveillance.

B. Can at least two-thirds of the target population be reached with expanded and integrated health services?

The answer is almost certainly "yes" although complete documentary evidence is not available at this writing. Already, a large proportion of eligible women (slightly over 50 per cent in the baseline Community Health Survey) are being reached, with family planning services. There is also evidence, at least in area E_1, that almost all deliveries are now attended by trained personnel. Pre-natal and post-natal services, however, appear to be weak, suggesting the need for improved supervision and followup. A higher level of complete pregnancy care can be achieved only if the wechakorn can galvanize the interest of the villagers and the service efforts of the village-based TBAs and the health center based auxiliary midwives. The same is true for immunizations, but this is compounded by the special requirements of bringing selected biological materials to the village in viable condition. There may need to be special immunization campaigns in Lampang, especially oriented to Diphtheria-Pertussis-Tetanus (DPT) and BCG for pre-school children, and tetanus for the general population (with particular emphasis on women in their child-bearing years). The need to continue giving smallpox vaccinations is highly doubtful. Coverage will be very difficult to measure unless mothers are supplied with cards for themselves and their babies. Cross-sectional surveys can only establish (more reliable for smallpox and BCG) the proportion of children immunized at least once over a reference time period.

Nutritional surveillance and follow-up case work is also a great challenge. Nutrition services have been under-financed (primarily because nutrition is not recognized by the province as a major problem), and services that are available seem not to reach children most in need. As described earlier, the Project has documented that between 10-15% of pre-school children in areas E_1 and E_2 are moderately to severely undernourished. What remains to be done is to systematically identify these children (already accomplished in some areas) and to establish an effective system of followup. Health education at the village level will need to emphasize better selection, preparation, and (within family)

distribution of available foods.

The Project also aims to reach 65 per cent of the total Lampang population with basic health services. In an earlier section of this report it was seen that total coverage is increasing, and although the proportion of care provided by rural health centers appears to be increasing on target, the relative contribution of the HPVs is somewhat below expectations. The proportion of care provided by the provincial hospital has not increased significantly, at least for E_1 residents.

Throughout the implementation period, the number of rural health centers and district hospitals (formerly first class health centers) has been increasing rapidly. Staffing of the district hospitals has also been strengthened; all have full-time physicians, a significant step forward over the incomplete staffing of the early 1970's. The Lampang Provincial Hospital has acquired regional status and is in the process of doubling its bed capacity. All these developments will bear on overall population coverage and its appropriateness. It will be increasingly difficult to tease out the role of the Project in promoting overall coverage, although the expansion of rural coverage, coupled with the growing availability of wechakorn, may be expected to shift the pattern of primary care toward the periphery of the health system. Care within the village may weaken and be by-passed unless more support, regular supervision, and continuing education are provided for the HPVs.

C. Can underutilization of existing Government peripheral health facilities be overcome?

The emerging answer is optimistic. There is little question that the wechakorn have made an extraordinary difference in increasing utilization of rural health facilities, although it is not clear that their activities will reduce or even hold constant the demand for more expensive health care at the provincial hospital. Hospital planners are clearly assuming that there will be more demand.

Wechakorn themselves may be overwhelmed with curative care, and find little time for preventive/promotive activities, unless the village health volunteers become more active and are better supported. To date, the potential

role for planning by the village health committee seems unrealized. It should be kept in mind, however, that villagers are often distracted by the requests of many other Governmental programs to set up various development-oriented committees. Health may not appear to be the most attractive or cogent of these. Moreover, given years of political passivity and the influence of rural Thai culture, villagers are unlikely to make demands or perhaps even requests of the local bureaucracy. The current situation is characterized more by "downward support" than "upward planning."

D. Can the health status of the population - fertility, mortality morbidity - be measurably improved by integrated and expanded health services?

It has been shown that fertility has been declining in Lampang for some time, and baseline surveys indicate that 50 per cent of eligible women in areas E_1, C_1, and C_2 are currently practising family planning. Given the apparent trend and its tempo, it will be difficult to attribute further change to the Project. It should be mentioned, however, that the Project may contribute to greater efficiency in fertility control. The distribution of pills by active HPVs may be expected to improve continuation, and the Mobile Unit's successful efforts to promote vasectomy will release women from the need to take hormones over a long period of time. For many couples, sterilization, especially vasectomy, is the most appropriate and desired method, and the Project has made improvements by offerring a high quality service, supported, in many ways, by village volunteers.

As for morbidity and mortality, the answer will rest on trends to be measured in future Community Health Surveys. Because of the inclusion of two control areas, one of them contiguous, but remote and unlikely to be contaminated by Project effects, the Project is protected against falsely concluding there has been a change attributable to its activities. Clearly, mortality is declining in Thailand, and this may be assumed to be so in Lampang as well. Morbidity is more elastic in nature and thus harder to measure, but, following the definition used in the baseline Community Health Survey, one might reasonably expect a parallel decline in disabling illness. Attribution of such declines to the Project could be overshadowed by the significant expansion of general health service in Lampang since 1974. One anticipates positive effects on morbidity and mortality

from Project activities, but they may be difficult to measure and even more difficult to clearly associate with specific Project inputs.

E. To what extent can management and efficiency of health services be improved?

Changing managment practices is a sensitive area, and is easier to influence at lower levels if the system supports lower-level decision-making. The addition of assistant district health officers may improve supervision and support at the rural health centers, much as the wechakorn should both stimulate and respond to the HPVs. Many management decisions, even within the project, continue to be based mainly on experience and intuition. This is often effective, but tends to underutilize information collected for management purposes. The Project's efforts to collect data, focussing selected information on management decisions, have been impressive thus far, but may need further strengthening. The Ministry of Public Health is currently conducting a series of rural health services management workshops for provincial personnel throughout the nation.

One basis for measuring efficiency has been laid in the Cost and Task Analyses in the hospital and health centers. It is clear that, in the rural health centers, at least, there is a significant amount of "idle" time. If demand for services by villagers increases and the staff capabilities are strengthened somewhat, it seems likely that the slack time may be used more efficiently.

F. Is is possible to replicate the Project's key features in other areas given normally available resources?

The key features to be considered here are the reorganized hospital/rural health service infrastructure, the wechakorn paraphysician, the village health volunteers, the involvement of the community and the private sector, and an improved management system.

Starting with the view of the provincial hospital as the nucleus of health services, at the center of an inter-related network of health centers and peripheral services reaching into the villages, the Department of Community Medicine was established to promote the hospital's community health role. Reaching outside the hospital's compound to support and coordinate a variety of curative outpatient

and preventive services in the larger community is not easily accepted by physicians trained under the Western medical model. Many feel their extensive training is wasted in dealing with the usually mild and often self-limited complaints of rural people. Trained to take care of rare, "interesting cases", they are not eager to move outside the hospital, even temporarily. The Department of Community Medicine in Lampang has grown slowly, gradually winning acceptance in the hospital and at the rural health centers. Soon its small staff will be increased by three wechakorn, greatly increasing its capacity to provide preventive/promotive services at the hospital and curative care and supervision in the rural areas. The usefulness and replicability of such a Department is evident, but although the Ministry plans to establish them in all provincial hospitals, final decisions on their structure, role and activities have not yet been made.

The Ministry of Public Health, in advance of definitive evaluation of the Lampang experience, has elected to train sufficient village health volunteers (HPVs and HCs) for 20 provinces in the Five Year Plan which began in 1977. The MOPH plans to use the Lampang Project training materials and job descriptions. In addition, the Ministry will train 1,400 nurse practitioners for the same 20 provinces. Unlike the wechakorn, all trainees will be nurses, thus avoiding the problem of Civil Service recognition of a new class of health worker. The nurse practitioners will be assigned only to the provincial and district hospitals -- not to the more rural health centers where there is a greater demand and need for illness care. Training will emphasize clinical skills, rather than disease prevention and health promotion for the village level. A plan is also underway to give 4 months of clinical training to midwives. These workers would return to the rural health centers to provide much more limited curative services and support for the village volunteers than is provided by wechakorn.

The supervisory implications of the Ministry's plans for "paraphysician" training will require great attention and effort. While there will be few problems with the nurse practitioner who almost always will work with a resident physician, the issue is how to tie the village volunteers to the specially trained midwife and how to provide logistical support and supervision to both, from the district hospital. The Lampang Project experience suggests how difficult this may be to achieve.

Replication of the management system begins with careful orientation and training of provincial and district level health staff. It means the use of carefully-honed information for decision-making and implies two way communication. It means efficient referral of patients to the most appropriate level of health care. Current plans to further strengthen planning and evaluation activities at the provincial levels will certainly be helpful.

Finally, although the data related to costs of the Lampang Project are preliminary in nature, it seems that replication of the major features are well within the Government's financial capabilities. Most of the Lampang Project's outside resources are non-repetitive, having been applied to development of methodologies and materials, and to evaluation and research. As the Ministry of Public Health implements similar features in other areas of the country, the costs should drop dramatically as economies of scale apply.

Figure 1, shown at the beginning of this paper, summarizes the evolution of integrated rural health care in Thailand, and the Ministry of Public Health's directions for the near future. It seems clear that plans for future implementation have incorporated features similar to those in Lampang, as well as the experience and lessons learned there. The completion of the Project evaluation and documentation process promises to provide further information and lessons which will be of use to the Ministry in implementing expanded rural health care. Consequently, the experience of the Lampang Project seems very likely to achieve its potential to serve the mainstream of Royal Thai Government health policy formulation, health planning and programming.

ABBREVIATIONS AND ACRONYMS

ADHO = Assistant District Health Officer

APHA = American Public Health Association

C_1 = Control Area, within Lampang Province (Mae Tah District, will convert to join E_3)

C_2 = Control Area, outside Lampang Province (in Lampoon Province)

CBFPS = Community-Based Family Planning Services

CHMU = Community Health (Department) Mobile Unit

CNC = Child Nutrition Center

DEIDS = Development and Evaluation of an Integrated (Health) Delivery System

E_1 = First Intervention Area, Hang Chat District

E_2 = Second Intervention Area, Southern District (including capital district)

E_3 = Third Intervention Area, Northern District (including, C_1)

HC = Health Communicator

HPV = Health Post Volunteer

LHDP = Lampang Health Development Project

MD = Medical Doctor

MOPH = Ministry of Public Health

MW = Midwife (TBA)

PCMO = Provincial Chief Medical Officer, now called Provincial Health Officer

PHO = Provincial Health Officer (formerly PCMO)

RTG = Royal Thai Government

TBA = Traditional Birth Attendant (Traditional or "Granny" midwife)

UHSPH = University of Hawaii School of Public Health

USAID = United States Agency for International Development

VHV = Village Health Volunteer, same as Health Post Volunteer (HPV)

WK, W = Wechakorn = Thai word for Community Health Paraphysician, an intermediate clinical care and basic health service provider (similar to "Medex" in the U.S.)

VHC = Village Health Communicator (or HC)

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