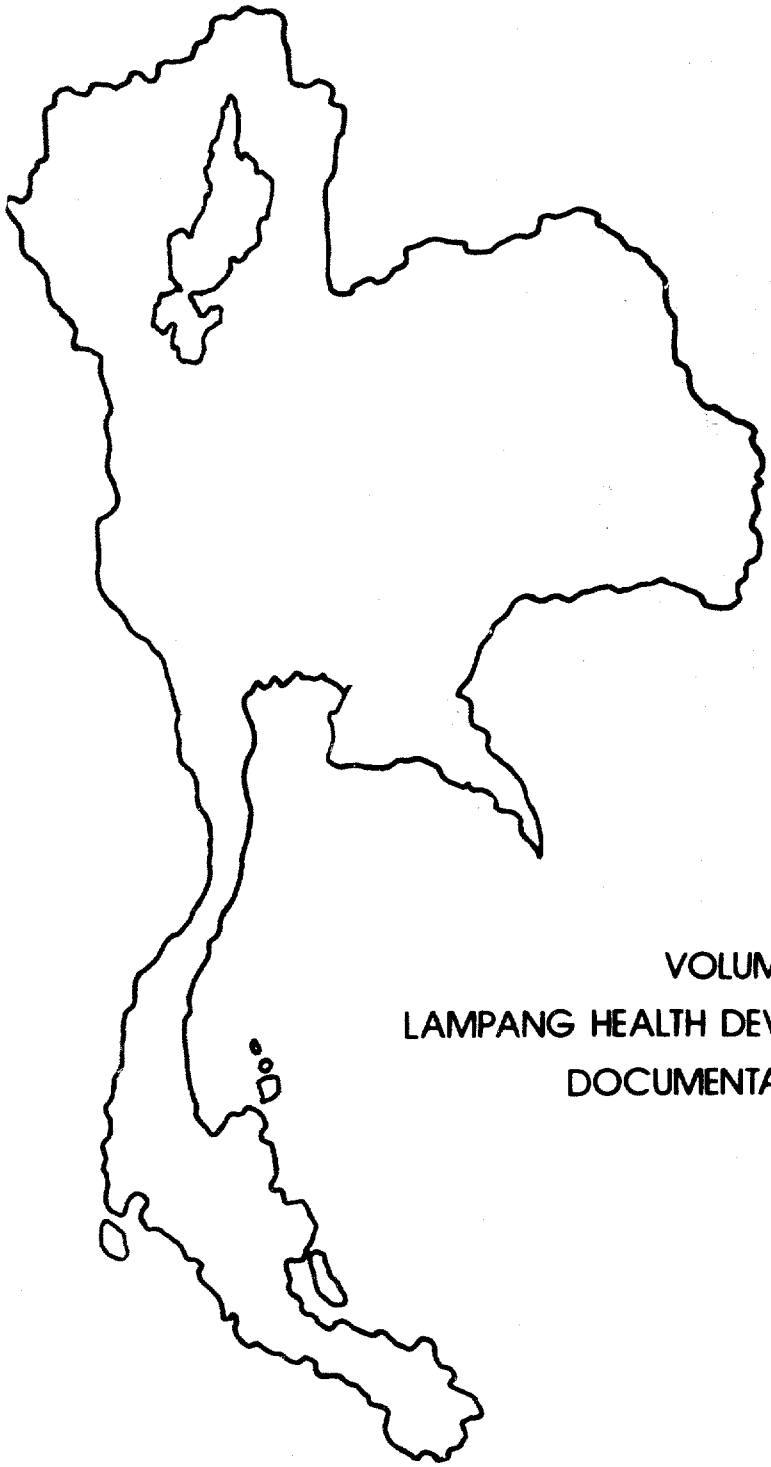
# EVALUATION OF THE LAMPANG INTEGRATED RURAL HEALTH SERVICES AND PRIMARY HEALTH CARE SYSTEM



VOLUME III

LAMPANG HEALTH DEVELOPMENT PROJECT

DOCUMENTARY SERIES

MINISTRY OF PUBLIC HEALTH THAILAND 1981

LAMPANG HEALTH DEVELOPMENT PROJECT

DOCUMENTARY SERIES

VOLUME III

# EVALUATION OF THE LAMPANG INTEGRATED RURAL HEALTH SERVICES AND PRIMARY HEALTH CARE SYSTEM

Ministry of Public Health
Thailand
1981

The Lampang Health Development Project Documentary Series

Is Dedicated To

DR. SOMBOON VACHROTAI

(1924 - 1980)

Project Director

1974 - 1980

# ACKNOWLEDGMENT

The Lampang Health Development Project, a collaborative effort of the Royal Thai Government, the University of Hawaii, and the American Public Health Association, was supported partly by the Royal Thai Government and partly through the following contracts of the U.S. Agency for International Development:

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# CONTENT OF THE LAMPANG HEALTH DEVELOPMENT PROJECT DOCUMENTARY SERIES

The documentary series comprises six volumes. Volume I summarizes the development, evaluation, conclusions and recommendations of the Project. Volume II describes the development of the Project, focussing on its key features, and Volume III presents the Project's evaluation, results, conclusions and recommendations. The remaining three volumes present translations of materials used in developing community health volunteers and paraphysicians, key manpower of the Lampang rural health care system.

VOLUME I: SUMMARY FINAL REPORT OF THE LAMPANG HEALTH DEVELOPMENT PROJECT (Monograph #12)

VOLUME II: DEVELOPMENT OF AN INTEGRATED RURAL HEALTH SERVICES AND PRIMARY HEALTH CARE SYSTEM IN LAMPANG THAILAND

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Monograph #2 - Developing Community Health Volunteers and Primary Health Care

Monograph #3 - Developing Community Health Paraphysicians (Wechakorn)

Monograph #4 - Expanding the Community Health Role of the Provincial Hospital

Monograph #5 - Strengthening Management, Supervision, and Support for Rural Health Care

Monograph #6 - A System of Evaluation and Management Information for Rural Health Care

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Monograph #7 - Evaluating and Monitoring Integrated Rural Health Services: Lessons from the Lampang Experience

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Module 14 - Public Health Administration and Primary Health Care
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Module 16 - Maternal and Child Health Care
Module 17 - Family Planning
Module 18 - Nutrition
Module 19 - Dental Health
Module 20 - Environmental Sanitation
Module 21 - Statistics
Module 22 - Epidemiology
Module 23 - Communicable Diseases Control
Module 24 - Health Education

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# FOREWORD

From 1974 to 1981 the Ministry of Public Health implemented the Lampang Health Development Project, a seven year effort to pioneer and research many approaches for integrating and expanding medical and health service coverage and for creating village-based primary health care services. During this period, I followed closely the reorganization of the provincial health administration, the integration of medical and health services, and the creation of the Department of Community Health in the Lampang Provincial Hospital with its outreach programs in rural health and medical care delivery. The major thrust of the health manpower development effort involved the training of three types of government health workers to serve as wechakorn paraphysicians in all subdistrict health centers and district hospitals, the training of thousands of villagers to serve as health volunteers and health communicators, and the training of hundreds of traditional birth attendants. The effort included the organization and orientation of village health committees, and stimulating contributions by the private sector and by the communities themselves. Beyond the increased demand for health services which resulted, I also noted with great interest evidence of village-based health activities supported by villagers in many localities: improvements in community water sources, installation and maintenance of handpumps for the newly improved and covered wells, nutritional surveillance, family planning supply distribution, and so on. The focus of the Lampang Project was primarily on the district, subdistrict and village levels.

In 1977 and 1978 the Ministry of Public Health drew upon the personnel and experience of the Lampang Project to help plan and conduct two national primary health care seminars. In March, 1979, the Cabinet of the Royal Thai Government approved primary health care as a National Health Development Policy. The Ministry drew heavily from the Lampang Project again in 1979 as it planned with the WHO and UNICEF a biregional primary health care workshop, with participation by nine countries of the south East Asia and Western Pacific regions. The first workshop was conducted in 1980, and we are currently planning with WHO and UNICEF for the next biregional workshop. The aim of these national and inter-regional activities is to rapidly feed back to planners and health leaders the field experience that is accumulating in Lampang and in similar efforts. One result, at the Thai national level, is the adoption of primary health care program implementation as a high priority in the National Social and Economic Development Plan.

The lessons and experience coming from Lampang over the past seven years have been quite useful to the Ministry of Public Health in planning and implementing

similar approaches for nationwide coverage. In a similar manner, the Lampang experience may be useful to others and this is one of the major aims of the documentary series that is presented herewith.

I wish to take this opportunity to express my gratitude and thanks to all institutions and agencies in Thailand and abroad that have contributed to the Lampang effort. While all the organizations in Thailand that have made contributions are too numerous to list here, two deserve special recognition for their longstanding support: the Chiang Mai University which provided two senior professionals to the Project who served as Chiefs of the Project's Division of Personnel Development and Division of Research and Evaluation, and the National Institute of Development Administration which played a key role in the research and evaluation effort. Special acknowledgement and appreciation is expressed for the contributions of the University of Hawaii which provided technical and managerial assistance throughout the seven year period, the American Public Health Association for its five year role in project management and liaison, and the U.S. Agency for International Development which was the major source of outside funding. We also appreciate and acknowledge the special purpose contributions of the U.S. Information Service Agency, the Asia Foundation, the World Health Organization, and the U.N. Children's Fund.

As Thailand enters the 1980's, the greatest aim of the Ministry of Public Health is to extend basic health services and to achieve health for all Thai citizens, if possible, by the turn of the century. The success of this effort will depend on three major factors: the seriousness and commitment of the Royal Thai Government in implementing its new Health Development Policy, the seriousness of health workers at all levels in serving those in need, and the ability and willingness of health workers to teach and guide villagers in matters of health and development, helping them to help themselves. Through continued effort and collaboration, like that of the Lampang Health Development Project, we have good reason to be optimistic.

May, 1981

Sem Pring-puang-geo

Dr. Sem Pring-puang-geo
Minister of Public Health
Royal Thai Government

# PREFACE

The Lampang Health Development Project, originally called the "DEIDS/Thailand Project" to singnify the development and evaluation of an integrated health care delivery system, was conceptualized, planned, implemented and evaluated by the Ministry of Public Health, Royal Thai Government, through shared commitment and colleaguial collaboration with the University of Hawaii and the American Public Health Association.

Health professionals and leaders from these institutions recognized that conventional approaches to health care delivery were not reaching those most in need -- underserved rural villagers who comprised the majority of the population. Further, new approaches had to be conceptualized and tested in the context of Thailand's health care system if basic health services were to become available to and utilized by rural villagers.

Project planners hypothesized that basic health services could be delivered more cost-effectively if integrated; that the demand for medical care services could be met, to a great extent, by upgrading existing health personnel to be clinically competent paraphysicians; and that the need for health promotion and disease prevention services could be more broadly and effectively extended through community participation. This participation could be achieved by training community health volunteers -- health post volunteers, traditional birth attendants and village health communicators as well as involving the private sector. Some elements of these approaches had been implemented in Thailand on a small (district-level) scale in earlier projects, but they had not been adequately evaluated. The Ministry of Public Health, already committed to the concept of integration of health promotion, disease prevention and medical care services, was ready to embark on a major effort to test this approach, and to find ways to broadly extend integrated basic health services to all rural villagers in Thailand.

Lampang Province in northern Thailand (see Figures 1 and 2) was selected as the project area because it had a population of over half a million people, fair communications, moderate economic status, minimal security and insurgency problems, and the endorsement of provincial authorities. While the overall and longterm goal of the Project was to improve the health status of the rural population of Lampang, the <u>specific objectives</u> of the Project were:

(1) to expand health care coverage to at least two-thirds of the rural population, particularly women in their child-bearing years and preschool-age children, with an emphasis on family planning, nutrition and other maternal and child health services;

(2) to establish an integrated provincial health care services delivery system with the capacity to extend integrated medical, health promotion and disease prevention services to every subdistrict health center, and to establish simple medical care, health promotion and disease prevention services in every village through community participation and private sector involvement; and,

(3) to establish an integrated provincial health care services delivery system that is more cost-effective, meaning lower cost per service unit, the key features of which could be replicated nationwide within the limitations of resources available to the Royal Thai Government.

Given these objectives, Project planners and personnel developed a number of innovations and modifications of the existing health system which constituted the key features of the Project, as viewed in Figure 3 and as summarized below.

(1) Reorganization and Strengthening of the Provincial Health Service Infrastructure by:

- Integrating the curative, disease prevention, and health promotion services by coordinating and administering them under a single provincial health administration;
- Establishing a Department of Community Health within the Provincial Hospital, and
- Improving management and supervisory practices, in part by developing a practical management information system;

(2) Development of Community Health Paraphysicians (Wechakorn) from existing health service personnel to be deployed to every district hospital and subdistrict health center;

(3) Development of Community Health Volunteers in every village, including training of a village health volunteer (health post volunteer) in every village, training of traditional birth attendants in every village where qualified candidates could be identified, and training of village health communicators for every 10-15 households in every village; and,

(4) Stimulating other Community and Private Sector Involvement by establishing health committees in every village and at every administrative level, and by eliciting the interest and support of other private sector groups.

The Ministry of Public Health and other agencies of the Royal Thai Government gan planning nationwide programs that would carry these approaches and key atures, as modified, to the whole of the country during implementation of the 77-1981 and 1982-1986 National Economic and Social Development Plans.

Several notable characteristics of Project development, planning and implementation had a bearing on the progress of the Project and on the acceptance of its proaches and key features:

* The Lampang Health Development Project was viewed from the beginning as a Thai project: Project planners, Project promoters, and Project leaders and decision-makers were predominantly Thai.

* The Project was established and directed by the Thai Ministry of Public Health, the official RTG authority that would be responsible for nationwide implementation if the approaches and key features were found to be worthy of "replication".

* Project and Ministry leaders developed and maintained a broad base of involvement of Ministry of Public Health personnel and other Royal Thai Government officials in all phases of Project development, planning, implementation, and evalustion.

* The Project maintained a continuing dialogue on Project approaches and progress with both Thai and international health agencies by providing Project information through periodic progress reports, organizing annual reviews and by conducting special workshops and seminars for review and refinement of Project approaches and key features.

* Project administrative, managerial, and technical assistance from the University of Hawaii and the American Public Health Association was characterized by a spirit of mutualism, a shared commitment, and a colleaguial collaboration. Technical assistance was not limited to one institution, but involved a number of international organizations, U.S. and Thai institutions and agencies. Project leaders recognized that the Project was dealing with a universal problem of how to achieve "health for all", and that this problem was best approached through broad collaboration and solid commitment, based on a spirit of mutualism and learning together.

This Lampang Health Development Project Documentary Series serves to comprehensively document the planning, implementation and evaluation processes, and to present the major findings and evaluation results of this seven-year effort. Volume I summarizes the Project's approaches and key features, evaluation and research findings, conclusions and recommendations. Volume II is comprised of six monographs which describe in detail the development and functioning of the Project's major approaches and components. Volume III is comprised of six monographs on evaluation findings, and discusses the Project results, conclusions and recommendations, based on the broad array of survey data, service statistics and other operational data that have been collected and analyzed. Volume IV presents the English language translations of Thai language materials used in developing and supporting community health volunteers -- health post volunteers, health communicators, and traditional birth attendants. Finally, Volumes V and VI comprise English language translations of the twenty-four Thai language training modules used in the development of wechakorn, community health paraphysicians.

It is the sincere wish of Ministry of Public Health and Lampang Project leaders, and of the authors, contributors, and editors of the Lampang Health Development Project Documentary Series, that readers of these materials will find the lessons learned and experience gained in Lampang useful in their own work.

Prakorb Tuchinda

Dr. Prakorb Tuchinda
Under-Secretary of State
for Public Health
Ministry of Public Health

July 1981

P. Ningsanonda

Dr. Pirote Ningsanonda
Deputy Under-Secretary of
State for Publid Health
and
Project Director
Lampang Health Development
Project

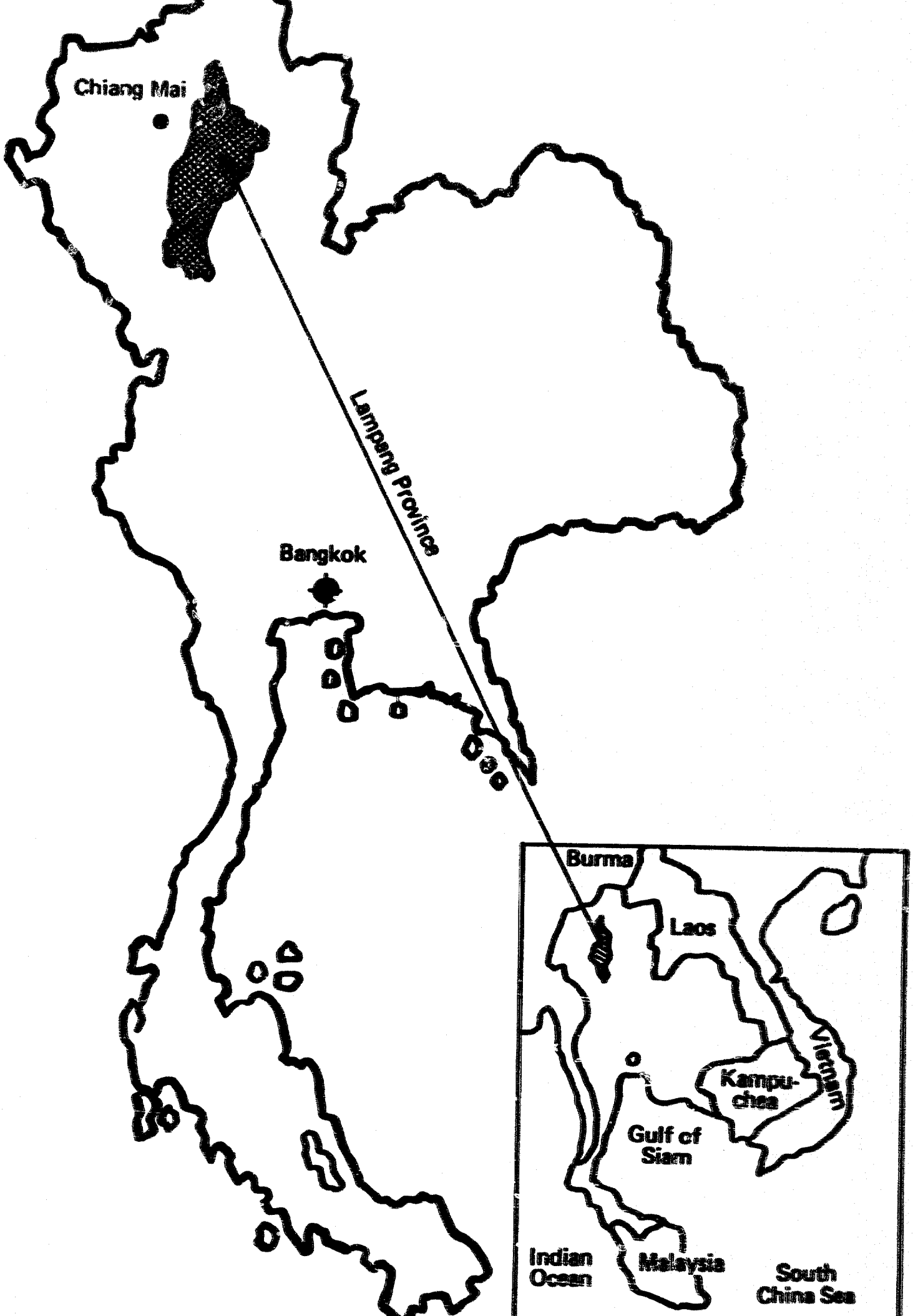
Chiang Mai
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Figure 2 Map of Lampang Province with Project Intervention Areas, Control Area#1, and Control Area#2 in Adjacent Lampoon Province

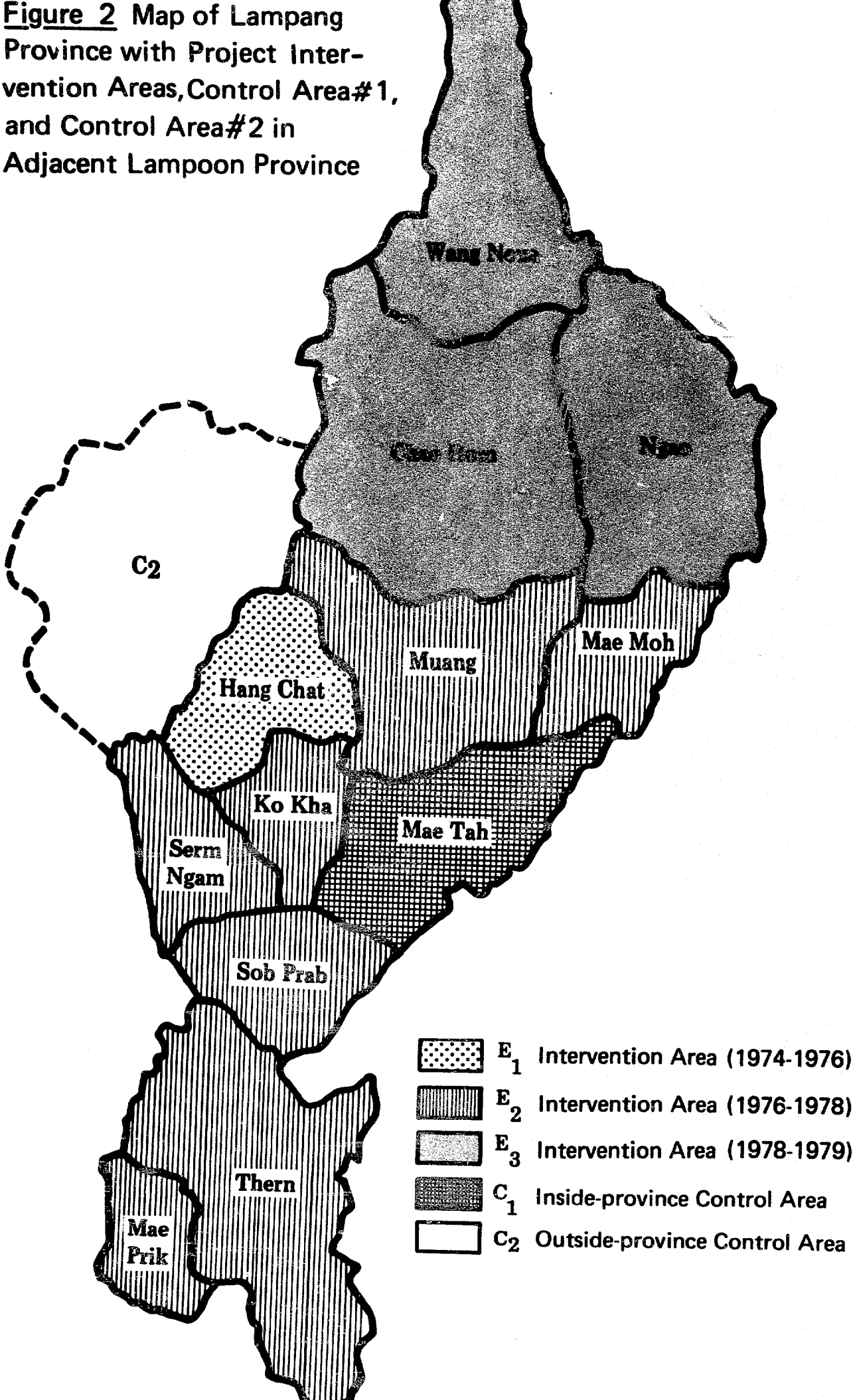
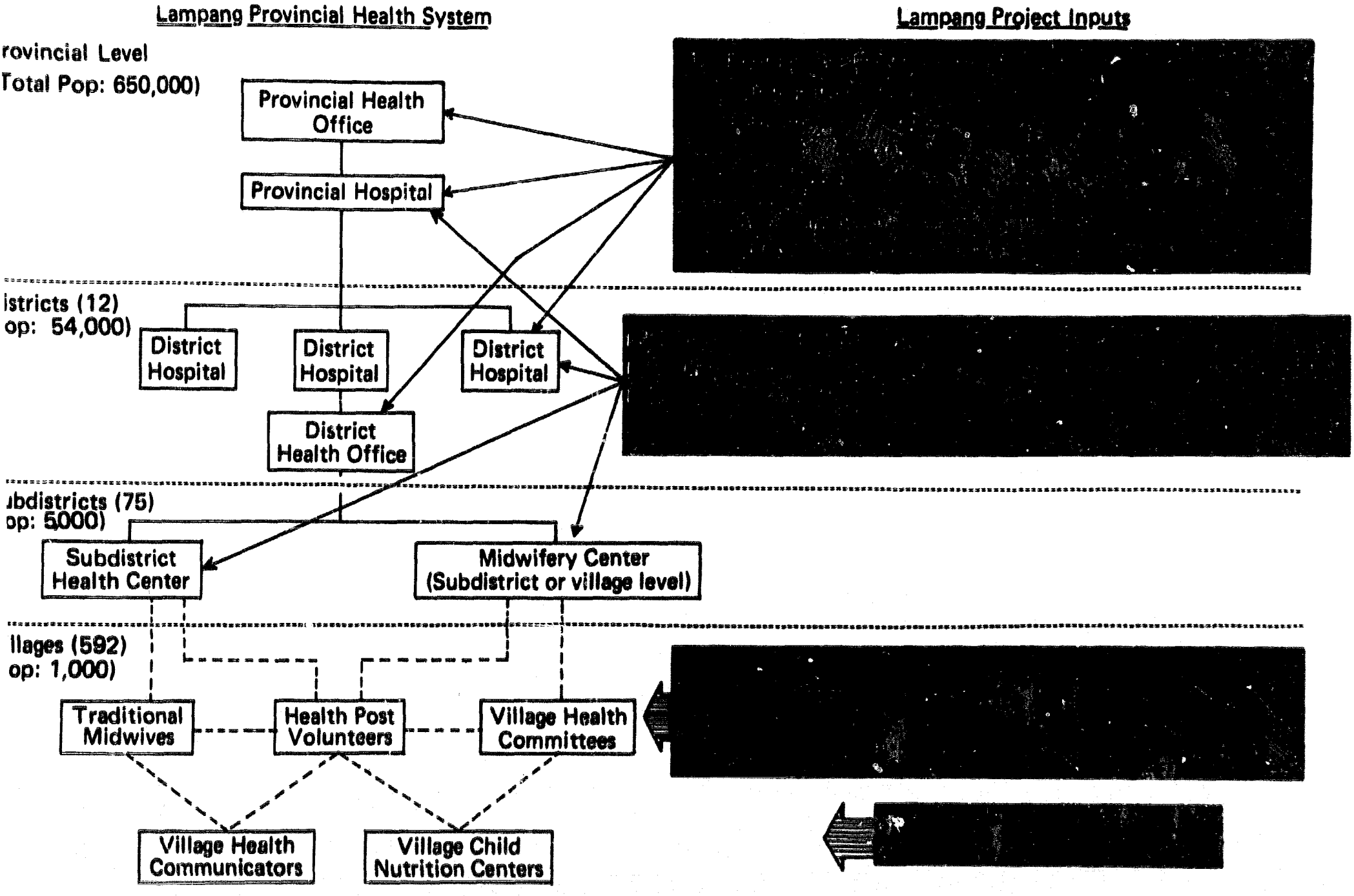


**Figure 3** Lampang Provincial Health System and the Inputs of the Lampang Health Development Project



# ACRONYMS AND TERMS

| | |
|---|---|
| AID/W | U.S. Agency for International Development/Washington |
| APHA | American Public Health Association |
| BAHT OR ฿ | Thai unit of currency (about 5 cents, or U.S.$ = ฿20) |
| CBFPS | Community-Based Family Planning Service |
| CHD | Community Health Department (Provincial) |
| CHV | Community Health Volunteers (HPV or VHV, VHC, and TBA) |
| CNC | Child Nutrition Center(s) |
| DEIDS | Development and Evaluation of an Integrated Health Delivery System (Project title during planning phase) |
| DISTRICT | A subdivision of a province (population of district about 50,000) |
| DOH | Department of Health (Ministry of Public Health) |
| FP | Family Planning |
| H/A | Height for age |
| HC | Health Center |
| HPV | Health Post Volunteers (or, Village Health Volunteer) |
| H/W | Height for weight |
| ICED | International Council for Educational Development |
| LHDP | Lampang Health Development Project |
| MCH | Maternal and child health |
| MEDEX | Physician extender training program |
| MOPH | Ministry of Public Health, Thailand |
| NIDA | National Institute of Development Administration, Thailand |
| PHO | Provincial Health Officer (or Office) |
| PHC | Primary health care |
| RTG | Royal Thai Government |
| SPH/UH | School of Public Health, University of Hawaii |
| TAMBON | A subdivision of a district, or subdistrict with a population of about 5,000 |
| TBA | Traditional birth attendant, or traditional midwife |
| UHSPH | University of Hawaii's School of Public Health |
| USAID | United States Agency for International Development |
| USAID/T | United States Agency for International Development/Thailand |
| VHC | Village Health Communicator |
| VHV | Village Health Volunteer (or Health Post Volunteer) |
| W/A | Weight for age |
| WECHAKORN | Community health paraphysician (trained by Lampang Project) |

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MONOGRAPH 11 - FEASIBILITY AND AFFORDABILITY OF IMPLEMENTING THE LAMPANG SYSTEM'S KEY FEATURES NATIONWIDE: IMPLICATIONS FOR THE FUTURE

# INTRODUCTION TO VOLUME III

One of the background documents that led to the development of support for integrated rural health demonstration projects such as the Lampang Project emphasized the fact that after reviewing conditions in many developing areas in the early 1970's it was apparent that less than 20% of the world's rural population had access to adequate health services. This observation was confirmed in Thailand by a number of surveys which indicated similar findings: less than 20% of the rural population utilized the variety of government health services that were widely available in the rural areas. The interest expressed by the donor agency (USAID) in seeking ways to improve the rural population's access to adequate health care coincided with a growing concern among health leaders in Thailand about the widely apparent under-utilization of available health services. The outgrowth of this mutual concern was the Lampang Project. One of the Project's major goals was to increase access by and coverage of the rural population -- particularly the vulnerable pre school children and women of reproductive age groups -- with government-supported health services, emphasizing integrated maternal and child health family planning and nutrition services.

The Lampang Project thus developed a series of key features (discussed in detail in earlier monographs of Volume II) designed to greatly expand the coverage and scope of the health care delivery system, to improve the quality of services provided within it, and to improve the system's credibility in the eyes of village users. The overall expansion and reorganization of the system was also designed to bring about more cost-effective delivery of health services and was ultimately expected to lead to measurable improvements in the population's health status.

The six monographs in Volume II provide a general overview as well as a more detailed description and preliminary assessment of the Project and its major components: the training and deployment of the paraphysician wechakorn; the development of a large, village-based primary health care network; the establishment of a community health department in the Provincial Hospital; the system of management, support, and supervision which coordinated the components; and the proposed system of evaluation established to

measure the Project's results. The five monographs of Volume III, building on those of Volume II, are devoted to assessing the results and achievements of the Lampang Project. Each of the monographs in Volume II is concerned with assessing a major aspect which the Project emphasized during its years of operation. The monographs of this volume incorporate, to a much greater extent, the broad range of data generated by the various Project-supported surveys and extracted from the provincial health information.

Readers who have already completed Volume II will observe that the monographs of Volume III are roughly organized around the four major Project evaluation objectives. These objectives have been followed as a general guideline, because to a great extent they define the areas in which Project planners emphasized the need for change, and to which the majority of effort and resources were devoted. These objectives were:

Objective #1: To measure availability and acceptance of services in experimental and control areas over time.

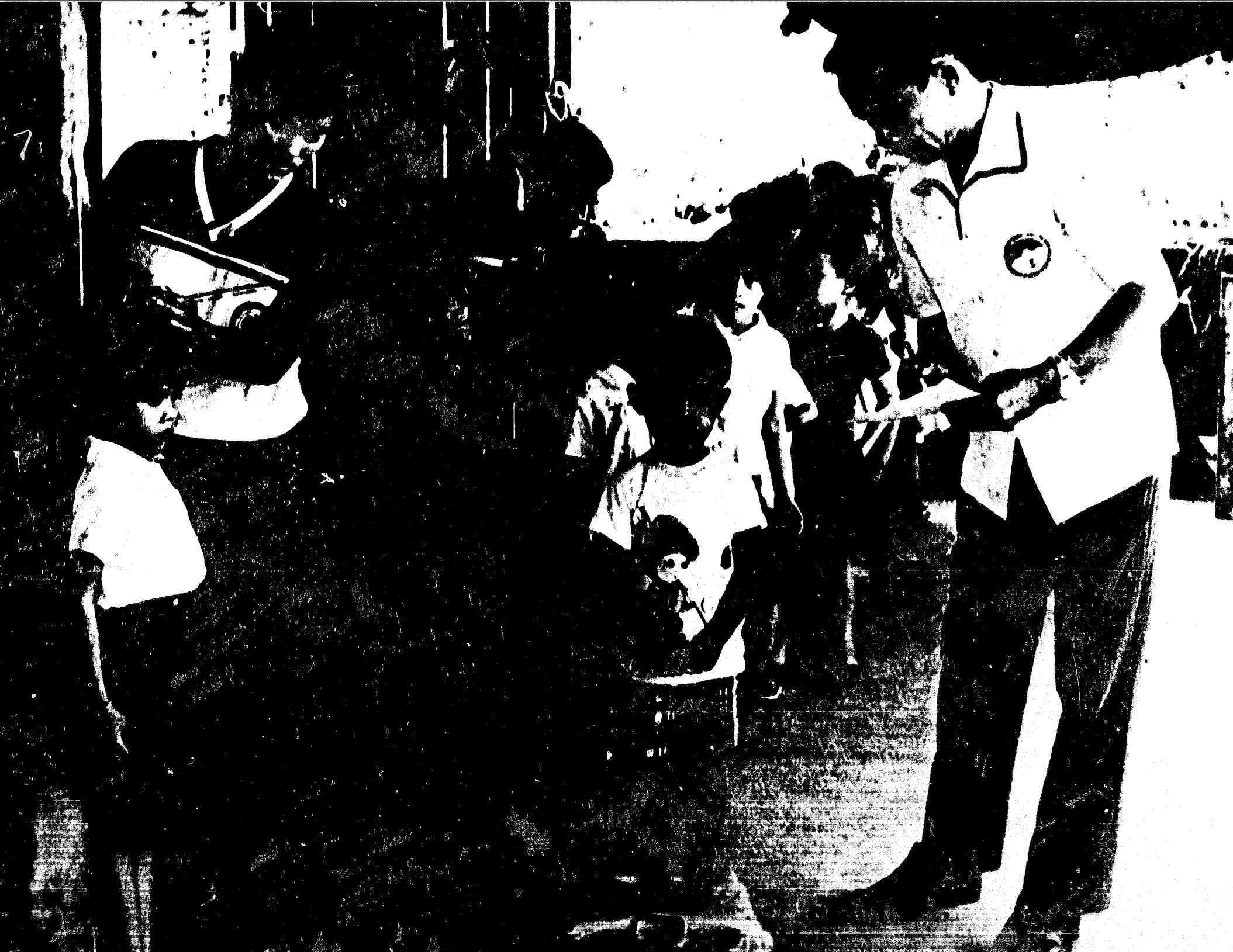
Objective #2: To assess the performance of the health system and its personnel and the costs of health delivery within the existing operations and management practices.

Objective #3: To measure the impact of integrated health services on the target population's health in terms of changes occurring in baseline health status indicators over time.

Objective #4: To assess the financial, social, and administrative feasibility of replicating the key features of the Lampang Project health delivery system.

Monograph 7 summarizes a number of the lessons gained from the process of evaluating a large, integrated rural health services project. Monograph 8 assesses the changes in the population's access to and utilization of health services during the period of Project operations. Monograph 9 deals with the changes in performance of the modified health care delivery system and its personnel, and the resulting changes in cost of service delivery. Monograph 10 assesses the changes in health status indicators that have

occurred; and finally, Monograph 11, drawing on the results presented these and in other monographs, synthesizes these findings and applies them to a systematic assessment of the potential for applying the project's major features in other parts of Thailand, given current government plans and resources.



# EVALUATING AND MONITORING INTEGRATED RURAL HEALTH SERVICES: LESSONS FROM THE LAMPANG EXPERIENCE

Pien Chiowanich
John Rogosch
Ronald Wilson
Jumroon Mikhanorn

Monograph 7

Lampang Health Development Project Documentary Series
1981

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Developing and operating a system for evaluating and monitoring integrated rural health services in Lampang was a major effort of the Lampang Health Development Project (LHDP). The need for in-depth evaluation of project results had been emphasized since the earliest days of planning the parent "DEIDS" Project (Development and Evaluation of an Integrated Health Services Delivery System Project). Consequently, a system for evaluating and monitoring rural health services was planned as an integral component of the DEIDS/Thailand Project (later called The Lampang Health Development Project) for the explicit purpose of measuring the accessibility and acceptance of health services by the population, the impact on the population's health, the performance and costs of the health delivery system, and the feasibility of replicating the project's key features elsewhere.

The outcome of planning the Lampang Project's evaluation and monitoring system is presented in Monograph 6 (Volume II), "A System of Evaluation and Management Information For Rural Health Care" and the results of the evaluation activity are presented in Monographs 7 through 11 (Volume III). But what experience has been gained and what lessons have been learned in the process of developing and operating a system for evaluating and monitoring rural health services?

Project planners and evaluators recognized at an early stage that the state of the art of evaluating and monitoring rural health care systems was embryonic and that useful lessons in the process of evaluation and monitoring health services might benefit others attempting similar efforts. Many of the project's visitors and observers have asked for more information on the process of evaluation and monitoring health services, on the difficulties encountered and solutions attempted on issues raised and lessons learned.

This monograph addresses the interests of these observers and attempts to document relevant Project experience in the process of evaluating and monitoring rural health services and to suggest a number of lessons of potential use to others undertaking evaluation and monitoring of similar large-scale, long-term demonstration projects. Many of the lessons learned may also be applicable to monitoring and evaluating large rural health service systems and national programs, as well as large demonstration projects like the Lampang Health Development Project.

# EVALUATION PLANNING: SPECIFYING OBJECTIVES, MAINTAINING COMMITMENT

## EARLY EMPHASIS ON EVALUATION AND SPECIFICATION OF OBJECTIVES

A review of early project planning documents, project proposals, contracts and agreements, and subsequent reports clearly indicates the emphasis that was placed on the evaluation and monitoring activity of the project throughout the ten-year process of planning and implementation. With a major emphasis on project evaluation, project planners incorporated general guidelines for monitoring the performance of the health system and for evaluating the accessibility and acceptance of health services, their costs and cost-effectiveness, their impact on the population's health, and the feasibility of replicating the project's key features elsewhere.

During the period of 1971-1974, before project operations began, the American Public Health Association (APHA) and the United States Agency for International Development (USAID) attempted to specify the general scope of evaluation and to establish general guidelines for evaluation. During this period a number of consultants were employed for this purpose, and an evaluation consulting firm was invited to prepare and present a document on general guidelines for evaluation of DEIDS projects that would permit, to the extent possible, comparative analysis of various projects that were planned under the DEIDS rubric. Various US institutions that were interested in participating with APHA in implementing DEIDS projects were asked to review and critique existing guidelines for evaluation; and as specific projects were being planned, national ministries of health and related institutions in the respective countries considered general guidelines on evaluation.

Although there was general agreement on the importance of evaluation by the various offices of the donor agency that contributed essential resources for funding the project, there was no agreement on precise evaluation objectives, indicators or methods. The problem of trying to satisfy the varying evaluation needs of the donor agency led one planner to characterize the process as one of "trying to shoot at shifting targets". While this process did promote an emphasis on evaluation and while it did outline the general scope of evaluation, it did not result

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in clearly specified evaluation objectives or indicators by which to measure achievement of project objectives.

Consequently, when Lampang Project operations began in late 1974 there was some agreement on general project objectives, on broad evaluation guidelines and, to an extent, on the general scope of evaluation. But the evaluation and monitoring system (and the implementation plan of the Project as a whole) still needed to be put into operation. The broad Project objectives had to be translated into operational objectives and targets on which an evaluation framework could be based. And the broad scope of general guidelines for evaluation had to be converted into a practical system for evaluating and monitoring operations with clearly specified evaluation objectives, indicators and methods.

In December, 1974, as field operations were being launched, Project leaders invited a large group of consultants -- from within and outside Thailand -- to meet with Project staff in an effort to clearly define Project and evaluation objectives, to specify indicators for evaluation purposes, and to plan component studies. There was a broad range of opinion concerning evaluation objectives, study components, and indicators, but the dialogue on evaluation activities to satisfy both ministry and donor needs continued between the Project, UHSPH, APHA and USAID for two years after Project operations began. Consequently, agreement on clearly specified evaluation objectives was slow to develop, and a comprehensive evaluation plan was not completed and agreed upon until 1976, the second year of Project operations.

Early and detailed planning of the scope and objectives of evaluation should begin and be concluded as early as possible in the planning stage of similar demonstration projects or of national implementation programs. Development of the evaluation component is dependent on clear specification of the objectives and outputs of project activity, and thus project operational planning and planning for evaluation must go hand-in-hand. This lesson may seem quite obvious, but in reviewing the history of the Lampang Project and other projects or programs, the problem of specifying evaluation objectives, indicators and methods early in the planning and implementation process still is apparent.

## INTEGRATING AND COORDINATING PROJECT OPERATIONS AND EVALUATION

With the extensive planning and programming, training and orientation requirements in the implementation plan for the Lampang Project, it was necessary to place heavy emphasis on getting full Project operations underway as quickly as possible. Time was required to develop training approaches and curricula, to select trainees,

and to prepare materials. A similar pattern was true for the evaluation process: a long period was required to develop and agree on specific evaluation objectives, indicators and methods, and to prepare the specific studies and instruments needed.

The Project's operational components for health systems planning and programming and for health personnel development quickly gathered momentum at the beginning of field operations. Priority was given to beginning training for the first groups of community health volunteers, and for curriculum preparations for training the first group of wechakorn paraphysicians. Preparation for training and field operations began before the existance of a complete data base on which to formulate plans and set targets. By the time the evaluation plan was detailed, the component studies developed and the baseline data collections begun in intervention areas, some Project activities had already begun. For example, in Hang Chat, the pilot ($E_1$) district, baseline data were collected after the first groups of community health volunteers had been trained and were working in their home villages. Similarly, a few volunteers had been trained in the seven-district $E_2$ intervention area before baseline data collection was completed. While these interventions had little apparent effect, they did introduce some minor irregularities into pre-intervention data sets.

Although the importance of evaluation had been broadly discussed among Project planners and evaluators, its requirements were not considered important enough to outweigh the recognized importance of successfully implementing the Project's key features. To delay introduction of interventions until after baseline data were gathered could have compromised overall Project objectives concerning coverage and replication. The need to begin quickly and maintain a high tempo of activity in such a large project is understandable. But careful attention should be given to integrating the project component plans and to coordinating project interventions and evaluation activities from early in the planning phase, and to maintaining this coordination throughout the operations phase.

## AGREEMENT ON AND COMMITMENT TO THE PROJECT AND EVALUATION PLANS

Reaching agreement on the overall project plan occurred over the period from 1971 to 1974, but reaching agreement on specifics of the evaluation plan was not finalized until 1976, nearly two years after Project operations began. The early project documents called for a total life-of-project of up to eight years, a reasonable period to achieve project objectives and evaluation objectives. The donor agency (AID/W) strongly promoted a comprehensive evaluation of the rural health services system, and the primary contractor (APHA), the subcontractor (UHSPH), and

pleteness or lack of precision of data. But it is the ultimate goal of this integrated analysis to provide insights concerning the extent to which the investment and reallocation of resources within the province produced changes in performance which were cost-effective.

## Sources of Data

The analysis of performance and costs outlined in the previous sections draws on data from several sources, both from the existing government health information system, and from special data generating mechanisms created by the Lampang Project. These sources include:

- -- National-level RTG and MOPH cost data
- -- Provincial health office, provincial hospital, and peripheral health facility cost records
- -- Provincial health service statistics and records
- -- Lampang Project Community Health Survey
- -- Lampang Project Task Analysis and Cost Analysis Surveys
- -- Lampang Project Administrative Analysis Survey.

As each part of the overall analysis is developed in the following pages, the nature and contribution of each of these data sources are further described.

CHAPTER 2

# EVALUATION TEAM: COLLABORATING WITH OTHER INSTITUTIONS

## RATIONALE FOR COLLABORATION

The parent DEIDS Project of the American Public Health Association, planned jointly by APHA and AID/W, called for an internal type of evaluation for monitoring project inputs, outputs, process, effects and achievements. Given the nature of the project and its purposes, long-term internal evaluation and monitoring was clearly needed in order to develop and test the most cost-effective approaches for rapidly extending rural health services, for monitoring performance, and for analyzing costs, performance, and impact. However, internal evaluation implies to many the possibility of introducing bias and the problem of maintaining objectivity in conducting evaluation activities and in interpreting their results. Involving outsiders and collaborating with other institutions in the evaluation process would help to maintain objectivity and to reduce the possible effects of bias. Several measures were taken by APHA and the MOPH to involve outsiders and to collaborate with other institutions: (1) APHA subcontracted the School of Public Health of the University of Hawaii to provide technical assistance to the MOPH, (2) the MOPH hired personnel from outside the MOPH to serve in the Project's Division of Evaluation and Research -- the Chief of the Division was an experienced researcher from the Chiang Mai University, his associate was an experienced statistician/epidemiologist from the Faculty of Public Health, Mahidol University, and his staff were also hired from outside the MOPH; and, (3) the Lampang Project Evaluation Board was established outside the MOPH and included consultants from the National Institute for Development Administration (NIDA), resident staff from the University of Hawaii and senior staff of the LHDP Division of Evaluation and Research including the division chief who served as chairman of the evaluation board.

There were other reasons for collaboration with other institutions and individuals. All of the necessary data-processing capabilities were not available at the project site. The National Institution of Development Administration (NIDA), a graduate educational and research institution composed of a number of technical faculties and well-trained staff, was approached by senior project staff to

collaborate in the evaluation of the Project. Although NIDA staff were not experienced in health services research, many were well-trained in such fields as statistics, computer science, social science, and management. Also, NIDA had just received a new computer that provided access to data processing. The computer's size and power were somewhat limited and programmer competence and experience were quite varied.

## EXPERIENCE WITH COLLABORATION

The team of evaluators from the National Institute of Development Administration (NIDA) was assembled and the Lampang Project Evaluation Board was established at the beginning of project operations. Since then, evaluation team members from NIDA, mostly from the Faculty of Applied Statistics, were intimately involved in planning details of many study components. The early NIDA contributions to the evaluation process were:

(1) Assistance in developing sampling procedures for the community health survey.

(2) Acceptance of responsibility for cost and task analyses, and for administrative analysis.

(3) Provision of data processing services at the NIDA Computer Center.

(4) Participation in the Lampang Project Evaluation Board, an advisory and coordinating body for the Project's evaluation activities.

Despite a delay in providing clear evaluation objectives and indicators, NIDA staff planned and conducted the Cost and Task Analyses and the Administrative Analysis. When evaluation objectives and indicators were finally agreed upon, the studies were adjusted as needed, and NIDA staff were very responsive. They were extremely helpful in the formulation of all studies. Beginning with only general guidelines they conducted studies and produced credible results which were usefully incorporated into the overall evaluation framework.

However, the general collaborative arrangements with NIDA did have some limitations which were crucial to the project evaluation process. Baseline surveys of the Cost and Task Analyses failed to produce the quality and clarity of data that were needed, partly as a result of the lack of clear definition of information items needed, and partly due to the inexperience in health services research of some responsible NIDA staff. Resolving this problem required that a new baseline survey for Cost and Task Analyses be conducted in the $E_1$ area, and that responsibility for

the study be undertaken by more experienced NIDA staff. After this, great improvement in the Cost and Task Analyses studies resulted.

Another constraint that appeared early but could not be adequately dealt with was that contractual arrangements between AID/W and APHA (including an agreement between APHA and the RTG) precluded the possibility of the project developing a contract or formal agreement with NIDA that would have specified terms. As a result, the Project could not arrange contracts with NIDA consultants for each component study. Instead, any work that was done by NIDA consultants was paid for on a time basis, rather than on the basis of completion of each survey or of each study. This was not completely satisfactory for either NIDA consultants or the Lampang Project staff. Project limitations on daily consultant rates were unsatisfactory to NIDA consultants, and may have delayed completion of some study components. Had the Project been able to subcontract with NIDA staff, then each study could have been arranged on a pay-as-completed basis.

In a period of over six years of collaboration, changes in the status and responsibility of the various NIDA collaborators had some effect on their implementation of the project study components. As NIDA staff members' abilities and experience became well-known, several became heavily involved in other consulting activities for both private and government sectors. At the same time, through promotions and changes in staffing, a number of the NIDA collaborators moved into more senior positions: one senior statistician consultant became Vice Rector of NIDA; one study collaborator became the Dean of a major faculty; one senior researcher became Head of the NIDA Research Center, and subsequently became Rector of NIDA. These changes altered, to some extent, their degree of continued involvement in project activities. Whereas most staff members were initially available with few limitations, as their responsibilities increased, as project work developed, and as the demand on their time increased their availability to the project diminished. Although this did not seriously hamper project-related work, it did take senior NIDA staff away from their day-to-day responsibilities for supervising project evaluation tasks which were sometimes assigned to junior staff members.

Several important lessons have been gained through this process of collaboration. When a wide range of tasks is required in a project and all technical capabilities cannot be provided by the project staff, it is natural to seek collaborative arrangements with other groups to strengthen the project's evaluation capability. However, given a commitment to collaboration, the danger of a diffusion of responsibility -- to the point where a project could lose control -- is always present. To offset such a situation, project personnel must provide frequent

liaison with and clear guidance for collaborating parties, including clear instructions for tasks assigned, assuring that all project needs will be satisfied before each study component survey begins. This places clear responsibility on project personnel to develop specific evaluation objectives in advance of assigning tasks to a collaborating institution. Moreover, it is important that an appropriate mechanism be developed that satisfies the financial needs of the collaborators, and assures that assigned work will be completed on schedule. At a minimum, project staff should be required to be involved in preparation of plans for each study component and to work closely with each collaborator to assure all project data needs are met.

The project must retain control of data processing, which means that in a project with as extensive a data collection and processing component as was present in the Lampang Project, a person skilled in statistics, data processing and computer science should be hired to supervise these activities. A data-processing protocol should be prepared in advance, and a computer center should be chosen for its capability to meet the data-processing needs in an efficient and cost-effective manner. For routine tabular summaries, standardized programs should be used wherever possible, minimizing the need for special programming. All data cards should be transferred to tape as soon as possible after they are punched, and tapes should be stored in triplicate under project control.

Overall, the Lampang Health Development Project's collaborative arrangement with the National Institute of Development Administration served well to further develop health services research and evaluation capabilities in this leading national development institution, and to focus more attention on health development as an important and integral component of social development.

CHAPTER 3

# EVALUATION DESIGN: MAINTAINING CONTROL AREAS

## EXPERIENCE IN MAINTAINING CONTROL AREAS

Mae Tah, one of the province's twelve districts, was designated as Control Area 1 ($C_1$) for comparison with other districts in which interventions were being introduced. Baseline data was collected in Mae Tah ($C_1$) and no project interventions were to be introduced until near the end of the fifth year (1979) of the project implementation period and after follow-up survey data had been collected. This would have enabled Project staff to assess and compare the change occurring in intervention districts with the control district which would have not yet received interventions. Mae Tah District, $C_1$, therefore was designated as the last district of the province to be covered by project interventions.

In 1978, when the fourth and last group of wechakorn paraphysicians entered training, a number of the trainees came from health facilities in Mae Tah. Eight midwives and sanitarians were selected from Mae Tah district, and they left their health center and midwifery center assignments to begin training in 1978. However, instead of replacing those midwives and sanitarian health workers with similarly trained workers, a number of wechakorn (who had already completed the one year of training) were sent to fill in during the trainees' one-year absences, substantially changing the scope of health center services in some facilities in the $C_1$ control district. Adding wechakorn paraphysicians to some health centers and midwifery centers before follow-up survey data was collected meant that Project interventions contaminated the control district for about one year. This became somewhat apparent when the follow-up data were collected. For example, during the follow-up Task Analysis survey, the presence of the wechakorn in several health centers and midwifery centers meant first that the facility staffing and the subsequent service-delivery patterns could not really depict a control area that had received no project interventions. Consequently, this action tended to limit the usefulness of the control area for comparative purposes.

Mae Tha District in the adjacent province of Lampoon was selected as a second control area ($C_2$). The purpose of having one control area outside of Lampang Province and one control area within Lampang Province was to facilitate accurate interpretation of results of the evaluation and to delineate the effects of provincial administration management and development which might affect results of the evaluation. Having a second control area proved to be useful not so much for the reason mentioned, but as a result of an unexpected event, as described below.

Given the progress of the Lampang Project during the early years of project operations and given the RTG mandate to the MOPH to extend basic health services to rural residents as rapidly as possible, in 1977 the MOPH launched the National Primary Health Care Program that would bring these approaches to every province of Thailand by 1981 and would establish village-based primary health services in every village of Thailand before 1986.

In the course of events, Lampoon Province was selected by the MOPH for intervention under the National Primary Health Care Program in 1977 and by 1978 Mae Tha District of Lampoon Province -- the Control Area 2 of the Lampang Health Development Project -- became contaminated by the National Primary Health Care Program, thereby limiting its usefulness as a control area. When project leaders reminded MOPH planners that launching the Primary Health Care Program in Lampoon Province would contaminate one of Lampang's control areas, the understandable response was that it would be unfair to withhold primary health care services from the people of Mae Tha District while the rest of the province would benefit from the scheme, particularly when there was a national mandate for rapid implementation of the program to meet the targets of the government's social and economic development plan. The arguments from the Lampang Project concerning the need to maintain the evaluative design in order to reap the maximum benefit from lessons that could be learned in the evaluation process were unconvincing to national level planners and decision-makers concerned with national priorities. However, this turn of events provided an unexpected opportunity to compare to a certain extent the results of the Lampang Project with those of the national program being implemented in $C_2$.

## ARE CONTROL AREAS ADVISABLE IN LARGE LONG-TERM DEMONSTRATION PROJECTS?

The experience in Lampang indicates that it is difficult to maintain control areas for long periods. $C_1$ and $C_2$ remained relatively uncontaminated from project-type interventions for no more than four years (from 1974 to 1978). Also, a number of other factors can affect control area survey results -- construction of facilities, electrification of villages, communications improvements, transportation

improvements, etc. -- making differences between control and intervention areas more difficult to interpret.

While it is difficult to maintain control areas as "true" control areas (i.e., without contamination) even for a relatively short period of time, it is unlikely that control areas can be maintained as a controls over a long-term period. Is it fair or even possible to withhold services from the residents of one district over a long period while the residents of surrounding districts are benefiting from newly installed services? To withhold services for two or three years might be possible, but can one expect to be able to withhold these services for five years or more without creating a public issue? Should a control area be maintained when doing so may appear to be inconsistent with national policies and priorities? Can control areas in large, long-term projects really be maintained in an "uncontaminated" state?

Without controls, however, it may be difficult to conclusively establish that change or achievements occurring in project areas were a result of project interventions, and that similar changes did not occur in other areas without project interventions. If control areas are built into the evaluation design, how can they best be maintained as controls?

These are relevant questions that must be weighed during project planning and implementation. But beyond these questions, one should also consider the substantial costs of conducting multiple surveys in control areas that, sooner or later, are very likely to become contaminated if the project is a large scale, long-term demonstration project.

# EVALUATION BY COMMUNITY SURVEYS: SELECTION OF SAMPLE POPULATION

## SAMPLE AREAS AND SAMPLE POPULATION

Baseline and follow-up surveys were conducted in nine of the twelve districts of Lampang Province, and in one district of neighboring Lampoon Province. The nine Lampang districts surveyed were in three areas: $E_1$ (Hang Chat District), the first district where project interventions were introduced during FY1974 and FY1975; $E_2$, a seven-district area where project interventions were introduced during FY1976 through 1978; and $C_1$, a single district (Mae Tah) which was designated as a control district within Lampang Province. The second control district, Mae Tha, was located in the adjacent Lampoon Province (see area map at the beginning of Volume III). In each of these areas, baseline and follow-up surveys were carried out; baseline surveys in $E_1$, $C_1$, and $C_2$ were done in 1975, and during 1977 in the $E_2$ districts. All follow-up surveys were done in 1979. No surveys were done in the remaining three districts (identified as $E_3$ on the map). The nine districts from which survey samples were drawn comprised between 65 and 70 percent of the province's total population.

Table 1 summarizes the Community Health Survey sample areas and population characteristics.

### Stratification by Household Size vs No Stratification

The Community Health Survey is a major source of data and has produced data of generally good quality. However, several items related to the quality of Community Health Survey data should be considered before beginning a review of the data in the monographs that follow.

Sample households were drawn from a household listing made in the first year of the Project which classified households by number of family members. The baseline sampling design in the $E_1$, $C_1$, and $C_2$ areas stratified households by size (1-3, 4-6, and 7+ members), then specified different sample rates for each of the household size strata. The sampling rate for small households was 10% of all small households; for 4 to 6 member households, it was 20% of all households of that size; and for the largest households, it was 25% of all households with more than 6 members.

Table 1

Sample Areas and Sample Population Characteristics for Community Health Surveys[a]

| Characteristic | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
|---|---|---|---|---|---|---|---|---|
| | BL | FU | BL | FU | BL | FU | BL | FU |
| No. districts | 1 | 1 | 7 | 7 | 1 | 1 | 1 | 1 |
| No. sample households | 1,539 | 759 | 2,600 | 1,291 | 1,060 | 530 | 526 | 256 |
| No. sample population | 8,841 | 4,166 | 13,760 | 6,571 | 6,270 | 2,948 | 2,950 | 1,308 |
| Av. household size | 5.7 | 5.5 | 5.3 | 5.1 | 5.9 | 5.6 | 5.6 | 5.1 |
| % with 1-3 people | 12.9% | 14.5% | 22.1% | 22.7% | 10.7% | 14.1% | 16.9% | 21.1% |
| % with 4-6 people | 51.2% | 54.3% | 50.3% | 53.2% | 52.3% | 57.0% | 49.6% | 57.4% |
| % with 7+ people | 35.9% | 31.2% | 27.6% | 24.1% | 37.0% | 28.9% | 33.5% | 21.5% |
| Sex ratio (M/Fx100) | 101 | 100 | 103 | 101 | 104 | 105 | 105 | 105 |
| % under age 6 | 12.2% | 8.2% | 11.9% | 9.0% | 12.3% | 8.1% | 10.7% | 6.6% |
| % under age 15 | 39.0% | 31.7% | 35.8% | 31.2% | 38.2% | 34.2% | 37.8% | 30.6% |
| % over age 60 | 6.4% | 7.5% | 6.8% | 7.6% | 6.2% | 6.8% | 5.8% | 7.0% |
| % women 15-44 | 21.7% | 22.9% | 22.4% | 23.3% | 21.9% | 22.3% | 22.5% | 23.2% |

[a] Baseline surveys done in 1975 for $E_1$, $C_1$, and $C_2$, and in 1977 for $E_2$; all follow-up surveys done in 1979.

After baseline data became available, the stratification by household size was found to have no important usefulness. Therefore, when the baseline survey in the $E_2$ districts was planned almost two years later, no stratification by household size was built into the random sampling design. Also, no stratification by household size was planned for all follow-up surveys. $E_2$ follow-up sampling, as in the baseline, did not incorporate stratification by household size. However, when the sampling in the $E_1$, $C_1$ and $C_2$ areas was done, half of the follow-up samples were drawn from the baseline sample; thus, part of the baseline bias concerning household size was retained to an extent, in these three areas.

The distribution of sample households by number of family members summarized in Table 1 shows considerable variation between areas in both baseline and follow-up surveys. In the baseline surveys, the proportion of households with 1-3 members ranges from 12.9% in $E_1$ to 22.1% in $E_2$ for districts inside Lampang Province. Likewise, in the follow-up rounds, the proportion of small households ranges from 14.1% to 22.7%. Within the $E_1$, $C_1$, and $C_2$ areas, there also appear to be important

changes in the household size distribution. In each of these areas, the proportion of households with 1-3 members increased between 12% and 31%. Only the $E_2$ area remained relatively unchanged.

It seems unlikely that such differences in household structure should be possible between the four areas (or at least for the three areas inside Lampang Province) However, the household size distributions between the single $E_1$ and $C_1$ districts are quite similar, whereas the proportions for $E_2$ are an average for seven districts, and may mask considerable variation. Nevertheless, it appears possible that the baseline sampling procedures in the $E_1$, $C_1$, and $C_2$ areas (which were also partially operating in the follow-up surveys) may possibly have introduced a degree of non-randomness. Comparisons between these three areas and the $E_2$ area have been made cautiously, and differential rates by household size have been examined wherever possible.

Comparison of sample age distributions in project and control areas with Lampang Province census data for 1970 and with sample age distributions from the national survey of fertility for Thailand in 1975 reveals general similarity of age distributions. This suggests that potential sample bias in the $E_1$, and $C_1$, and $C_2$ areas may not have been an important concern.

CHAPTER 5

# EVALUATION OPERATIONS: ENSURING TIMELY AVAILABILITY OF DATA

## DATA COLLECTION

Baseline data collection for some of the major studies, including the Community Health Survey and the Cost and Task Analyses, began a few months after project operations began. However, a lack of clarity of specific evaluation objectives and of a detailed analytic framework affected the planning of these studies and the development of instruments for data collection. Generally data collection focussed on coverage, utilization, impact, performance and cost. But when specific data needs were not clearly defined, some of the studies tended to follow the interests and biases of the individual heading the study, which sometimes resulted in much more data being collected than was needed. And some important aspects of the Project, in retrospect, may have been given less attention than they merited.

Maintaining timeliness of data collection and processing is an important consideration in the process of planning and implementing systems for evaluation and monitoring of rural health services. Had data collection begun earlier and the data been processed more efficiently, analyzed data could have been made available to project leaders earlier and adjustments could have more readily occurred in the Project's training programs and in its field activities. This would have permitted the monitoring and evaluation activity to play a more substantive role in providing important management information for both project and provincial health leaders.

## DATA PROCESSING

The area that was the most problematic in the long collaborative relationship with NIDA was data processing. It was one of the weakest links in the relationship, and yet one of the most crucial. There are several dimensions to the data processing problem, some directly related to NIDA, and others related to the project. These problems concerned: (1) computer hardware and software, (2) computer programming and data processing, and (3) the coordination of data processing.

## Computer Hardware and Software

The computer donated to NIDA was a relatively small model, but was considered sufficient to handle the Project's data-processing tasks. However, when first installed, it had no tape drive, and all programs and data had to be stored on computer discs. Because of the fragile nature of the discs, all data was stored at NIDA and the Project never had a copy of its own primary data. This made it virtuall impossible for the Project to do any independent analysis of the data outside the NIDA computing facility. Later, NIDA added a tape drive to its computer, and all data and programs were transferred to tapes. However, even then, it would have been a major additional programming step to adapt the NIDA tapes for use in another, more standardized, computing facility. This basically limited project staff access to their own data, and prevented them from effectively seeking data-processing alternatives when problems arose.

## Computer Programming and Data Processing

Because of the newness and modest size of the NIDA computer, there were almost no standardized programs that could be used in processing the Lampang Project data. Therefore, for the Community Health Survey individual programs had to be written for more than one hundred tables initially requested by the project even though the tables were not complex in nature. This, of course, involved a great amount of time and effort in writing and debugging the individual programs, and it also introduced the possibility of programming errors that would not have been present in standardized programs. Moreover, given the necessity of hand-programming every table, project staff felt reluctant to request new processing tasks unless absolutely necessary because of the many delays already experienced.

The programmers hired to do the Project's processing tasks were generally inexperienced, which probably increased the time required and the possibility for errors in the hand-programming tasks. There were several changes in programmers during the course of the Project, and this affected the continuity of baseline and follow-up programming, as later programmers were not always clear about what the earlier programmers had done. The programmers also were not experienced enough to suggest improved approaches that might be needed, or to deal efficiently with problems that arose. In many cases, they were learning as they proceeded. Some of the tasks assigned to the programmer were also shared with student computer operator and their results sometimes clearly indicated a need for improved quality control.

All of these problems led to an inordinate delay in producing the tabular summaries of Community Health Survey data that the Project had requested.

It was more than one full year from the time that the first baseline data was collected and coded to the time that it became available in tabular form. Part of the delay was due to coding and editing problems, but a major part of the delay was a result of the factors discussed above. Although the first delays were encountered and the computer log jam was identified early in the project, the problem persisted. Other alternatives were considered, but none could readily be utilized because of the hardware complications mentioned above and because raw data was not available to Project staff.

Coordination of Data Processing

The responsibility for these problems does not, of course, rest completely with NIDA. The Lampang Project did not have a staff member who was experienced in computer science and sufficiently skilled in computer data processing to assist in or supervise all of the NIDA data processing tasks and to identify problems and work to resolve them at an early stage. In the final stages of Project evaluation, when time was short, Project evaluation staff took a more active role in reviewing and monitoring NIDA's data processing, and worked closely with the NIDA programmer and staff.

## DATA ANALYSIS

The delays in collection and processing of survey data sets resulted in delayed analysis of these data and, to a great extent, the unavailability of analyzed survey data for purposes of project review, administration and management. Project and Provincial Health Office personnel, however, did monitor health service utilization and performance, primarily through health service statistics available from the Provincial Health Office and the Provincial Hospital. Attempts were made with partial success to streamline the system for collection, processing and analysis of service statistics in an effort to improve the health information system and to strengthen the administration and management of the health care system in Lampang. In an effort to assist the Provincial Health Office, Lampang Project personnel took responsibility for some data analysis and for reporting important management information to Project and Provincial Health Office personnel. As the Project began its phase-out, Provincial Health Office personnel assumed responsibility for these functions. While the general quality of data appeared unchanged, the timeliness of reporting did lag somewhat. To maintain quality control and timeliness of data collection, processing and analysis, the importance of data for management purposes should be emphasized, backed up by regular utilization of these data for management purposes. If health administrators do not

regularly request and utilize data for management and planning, there can be little importance placed on the need for data by those who are responsible for its collection, processing and analysis.

The problem of chronic delays in data processing of survey data sets resulted in subsequent delays in the extensive tasks of data analysis and interpretation of Project results. Although much survey data was available by the last year of Project operations, all survey data sets requested from NIDA were not available until a few months before the end of the Project. This left little time for conducting analytic procedures, or for using all the data that was collected. However, analytic procedures needed to meet evaluation objectives were completed before the end of the Project.

CHAPTER 6

# EVALUATION PHASE-OUT: PROMOTING A STRENGTHENED MONITORING SYSTEM

The project was designed to demonstrate a number of new approaches using the existing provincial health care system. A new and separate delivery system was not set up, but new approaches were incorporated into the existing system to improve and expand its service capability. A similar approach was used with the Project's monitoring system: it built upon the existing provincial health information system. On one hand, the monitoring and evaluation process required utilization of data available in the existing provincial health information system, but this had to be supplemented by other data which could only be gathered through special surveys and studies organized by the Project.

Although special studies and the Community Health Surveys were important to both planning and evaluation activities of the Project, they are not a routine function of the Provincial Health Office. They are also generally expensive and their costs exceed the financial or technical resources of the Provincial Health Office.

However, other program monitoring and management information elements which were generally conducted on a routine basis are important for continuation in Lampang and for application elsewhere. Performance of government health facilities and personnel can be monitored through the established reporting system. The system of reporting monthly activities of village health volunteers and the monthly health services reporting system are monitoring components that are important to continue in Lampang and to emphasize in other provinces as the Ministry of Public Health implements the Primary Health Care Program and other high priority programs nationwide. Maintaining the volunteer reporting network and integrating it into the provincial health service reporting system was formerly carried out by the Lampang Project Evaluation and Research Division. As project field operations came to a close and as the Provincial Health Office assumed responsibility for monitoring and reporting health post volunteer performance, some difficulty was experienced in maintaining the system.

In each province, a member of the Provincial Health Office has been assigned responsibility for planning and evaluation; such a person needs to have specific training in management information systems. Such training should clearly specify the types of information to be monitored, how data should be collected and processed, how to construct or compute the indicators needed to measure and assess progress, and how to format this information and report it to concerned officials and health facilities.

As the government health care system expands, particularly with the addition of thousands of volunteers, it becomes very important to have some simple means to monitor volunteer activities. One person in each province should be given clear responsibility for monitoring relevant information and for producing a monthly summary with which to communicate the results to provincial decision-makers. He/she should be given training to equip him to handle the responsibility capably. Such training might best be developed in a collaborative arrangement among the Planning Division, the Rural Health Division, the Primary Health Care Division, the Epidemiology Division, and the Statistics Division of the Ministry of Public Health.

## CONCLUSION

The foregoing discussion presents a number of experiences and lessons learned, some general and some specific, in the process of monitoring the Lampang health delivery system and evaluating the key features and overall achievements of the Lampang Project. The evaluation process began with planning in the early 1970's, continued during the development and implementation of the Lampang Project, and concluded with the final analysis, interpretation and documentation of results in 1981.

As the aim of this monograph is to share the most relevant experience gained and the most important lessons learned in the process of monitoring and evaluating the large provincial health care delivery system in Lampang during the seven years of the Lampang Health Development Project, it might be useful to summarize the most relevant and the most important of these, as follows:

** The scope of evaluation, clearly stated evaluation objectives, the evaluation design, and the most relevant and practical objectively verifiable indicators should be agreed upon as early as possible in the planning phase -- or no later than the first months of the implementation phase. Once agreed upon, all concerned parties should maintain adequate support for and commitment to the evaluation plan so that the evaluation can be completed with sufficient resources and time, and without unnecessary constraints, delays, or distractions.

** If an evaluation and monitoring system is a major component of a project and requires the cooperation of personnel who are normally not involved in evaluation and who may not have a full appreciation for evaluation, a strong orientation to the importance of evaluation and to the evaluation scope, design, and methods should be provided to these personnel and be reinforced as often as necessary.

** A quasi-experimental design using control areas, such as was planned for the Lampang Project, is more practical in a small project that can be completed in a relatively short time (e.g., one covering a population of less than 100,000 in a well defined area during no more than five years). But, in a large-scale, long-term project -- especially if such a project is implemented through an existing government infrastructure -- the value of using control areas can be limited by the tendency for control areas to become contaminated by project interventions, both directly and indirectly as occurred in Lampang. Therefore, project planners should seriously consider the substantial costs in money, time and effort when deciding the utility of and need for including control areas in a project evaluation design.

** Collaborative involvement of other institutions in the evaluation process can be productive and facilitate the process, but care should be taken in developing mutually agreeable collaborative arrangements that promote efficiency and high quality work and which clearly keep control in the hands of project personnel who are ultimately responsible for the evaluation. Remunerations should be made for work completed and not simply on a time-worked basis. Additionally, project personnel should always maintain control of the data in all its various forms.

** Data quality control should be imposed at all key steps, particularly during data collection, collation, coding, and processing. Problems that emerge should be identified early through close supervision by experienced personnel. If data processing problems emerge, these should also be rectified early to avoid serious delays near the end of the project when time is short.

** If elements of the monitoring and evaluation system are to be maintained after the close of the project, responsibility for these elements should be assumed by others long before the end of the project so that procedures can be supervised by project staff and the completeness, accuracy, and timeliness of reporting can be maintained.

These are some of the important evaluation issues that have engaged the attention of Lampang Health Development Project staff in the process of planning, operating, and completing the evaluation and monitoring activity of the Project. As the reader reviews the details of the results of evaluation in the monographs that follow, other experiences and lessons may also become apparent that may be of value to those engaged in similar efforts for monitoring and evaluating large health delivery systems or demonstration projects like the Lampang Health Development Project.

# ACCESSIBILITY AND ACCEPTANCE OF RURAL HEALTH SERVICES IN LAMPANG

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The major objective of the Lampang Health Development Project was to cover at least two-thirds of the target populations with integrated illness care services, family planning services, MCH services and other basic health services. Thus, a major evaluation objective was to measure changes in accessibility and acceptance of health services in project areas over time. The main purpose of this monograph is to document the changes that have occurred in the availability of health manpower, facilities, and services, and the population's access to them; and to assess changes in the level and patterns of utilization of those services by the rural population.

Beginning more than a decade ago, a number of observers noted a distinctive feature of the Thai government-supported rural health care delivery system: it was underutilized by the rural population which it was aiming to serve (Cunningham, 1970; Bryant, 1970; Riley and Sermsri, 1974; Day and Leoprapai, 1979). While there remained many rural areas which government health services had not reached, in most areas where facilities were available the rural population made little use of them. National and regional surveys repeatedly indicated that only about 20% of the rural population, even when ill and seeking medical care, would take advantage of available government health services.

Some of the major reasons suggested for the apparent underutilization of available health services were:

-- The rural health centers were poorly located,making access difficult.

-- The capability of rural health workers to provide medical care services which were most frequently sought by villagers was strictly limited by Ministry of Public Health policy and by the scope of the workers' training.

-- The range of medicines available at most rural health centers was narrow, further limiting the range of medical care services.

-- The importance of disease prevention and health promotion services, the major responsibilities of rural health workers, was not well appreciated by rural villagers.

-- Past interactions at government health facilities sometimes subjected patients to long waits, discourtesies, and other inconveniences, making them reticent to seek care again, or to recommend the facilities to friends.

Health leaders in Thailand, recognizing these problems, began to seek ways to improve and increase the capability and credibility of government health care services. When APHA approached the RTG and proposed development of a large-scale integrated health services demonstration project designed to improve health care coverage of rural populations, leaders within the Ministry of Public Health (MOPH) were ready to test a variety of conventional and nonconventional approaches designed to confront the problems of access to and underutilization of rural health services. Thus the Lampang Project has attempted to strengthen the factors which stimulate utilization of services and to change the conditions responsible for underutilization.

Lampang Project planners believed that improvements in the availability and accessibility of rural health services would lead to greater acceptance of services by the population and, eventually, could bring improvement in the rural population's health status. They further believed that by deploying more appropriately trained health workers, and by improving available health facilities, the rural population's access to a broader range of health services would be increased. Assuming that the Project's improved range of services was technically credible and was responsive to consumers' felt needs, increased acceptability and utilization of services by the rural population would result. Also Project planners believed that integration of medical care, health promotion and disease prevention services -- brought closer to the homes of villagers -- was an important mechanism to enhance the acceptability and utilization of health services, and to increase the cost-effectiveness of the delivery system. Improved cost-effectiveness was also seen as a key to establishing the feasibility of implementing project approaches in other provinces of Thailand.

Statements in early Project planning documents outline the concern for access, acceptability and affordability, and the strategies to provide for them:

> "The original Project proposal called for long-term (up to eight years) pilot, experimental work to be carried out... Such an experiment has never been tried before with a large population base (500,000 or more) in such a manner that general conclusions on access, acceptability, and affordability can be drawn...

> The purpose is to develop and demonstrate a low-cost multipurpose delivery system in Lampang Province which, as a minimum, provides family planning services integrated for consumer acceptance with MCH and other basic health services and nutrition, used by two-thirds of the women of reproductive age and children under six at a cost which does not exceed resources available to the Province, to thoroughly test the system for replicability, and to gain useful experience which can be applied to the establishment of low-cost integrated systems elsewhere in Thailand and in other countries... Coverage of the target group should increase from 48,300 or 20% in 1974 to 198,600 or 65% in 1981. The purpose of the Project will be achieved when these targets have been accomplished and the Royal Thai Government (RTG) decides to introduce the system to other provinces." (Capital Project Paper for DEIDS/Thailand, USAID, 1974.)

Formulation of the Project design and the plan of implementation emphasized the importance of increasing the availability of health manpower. Consistent with the Project plan, the MOPH planned similar increases in the number of health facilities in Lampang and in the range of services provided. It is important to recognize, however, that the major manpower development thrust of the Lampang Health Development Project -- developing cadres of village-based health post volunteers, health communicators and traditional midwives -- was not dependent on greatly increasing the numbers of government health facilities. But the Project strategy did require strengthening and expanding the service capabilities of existing government health personnel, particularly by developing wechakorn paraphysicians from among existing nurses, midwives, sanitarian health workers and nurse aides to provide integrated health and medical services, and by establishing patient referral mechanisms, technical guidance and logistics support needed for a broadly expanded rural health care system.

Developing village health posts, manned by health post volunteers who would help coordinate the work of traditional midwives and health communicators, and linking these village health posts to the existing government health centers and midwifery centers were expected to greatly increase the availability of health services, improve the access of villagers to health services, and to increase the acceptability and utilization of these services by villagers with the greatest need for them: women of child-bearing age and children under age six.

The project evaluation plan focussed on measuring change in the availability and acceptability of health services -- and, more specifically, on utilization of these services by the rural population in Lampang. This monograph will describe and discuss the observed changes. Other monographs which follow will build upon these findings to analyze health services costs, cost-effectiveness of the health system, impact on the population's health and environment, and the feasibility of implementing the Project's key features in other provinces of Thailand.

CHAPTER 1

# BASIC CONCEPTS AND MEASURES OF ACCESSIBILITY AND ACCEPTANCE OF HEALTH SERVICES

As the Lampang Project's major evaluation objective was to measure the target populations' access to health services and their acceptance of health services or, more specifically, their utilization of available health services, it was important to define these terms, to clarify their relationships in a conceptual framework, to elaborate key factors that affect consumer-provider interactions, to select appropriate measures of accessibility of health services, including the availability of health services, and to identify appropriate sources of data from which measures of accessibility and acceptance of health services could be constructed.

## BASIC CONCEPTS AND CONCEPTUAL FRAMEWORK

### Availability of Health Services

The "availability" of health services is a major factor of the accessibility of services, and is taken to mean the physical presence of a health services provider who constitutes a primary entry point to the health service system, either providing the service directly, or providing referral to another health care provider at an appropriate facility level. In the context of the Lampang setting, the availability of primary health services at the village level is understood to mean the presence of a health post volunteer, a traditional midwife in the village (or in an adjacent village), or a government midwife at a midwifery center in or near the village. Availability of services at the subdistrict level refers to the presence of a subdistrict health center, generally staffed by a government midwife and/or sanitarian health worker, many of whom have undergone wechakorn paraphysician training. At the district level, availability refers to the presence of a district hospital, generally staffed by a physician, wechakorn paraphysician, nurse, midwife and/or sanitarian health workers.

### Accessibility of Health Services

"Accessibility" is taken to mean the composite of the characteristics of health services which facilitate or obstruct their utilization by potential consumers.

A primary factor of accessibility is the availability of health service providers and, to a lesser but still important extent, the availability of health facilities.

Accessibility also incorporates such factors as the availability of needed drugs and supplies; affordable costs to consumers who seek and receive services, including service cost, transportation cost, and cost in time; and social factors relating to the consumer-provider interaction, such as the service provider's attitude towards and rapport with consumers. Whereas the availability of health manpower and services is a prerequisite for ısumer access to health services, the consumers' access to health services is clearly a prerequisite to acceptance, or utilization, of health services.

Acceptability and Acceptance of Health Services

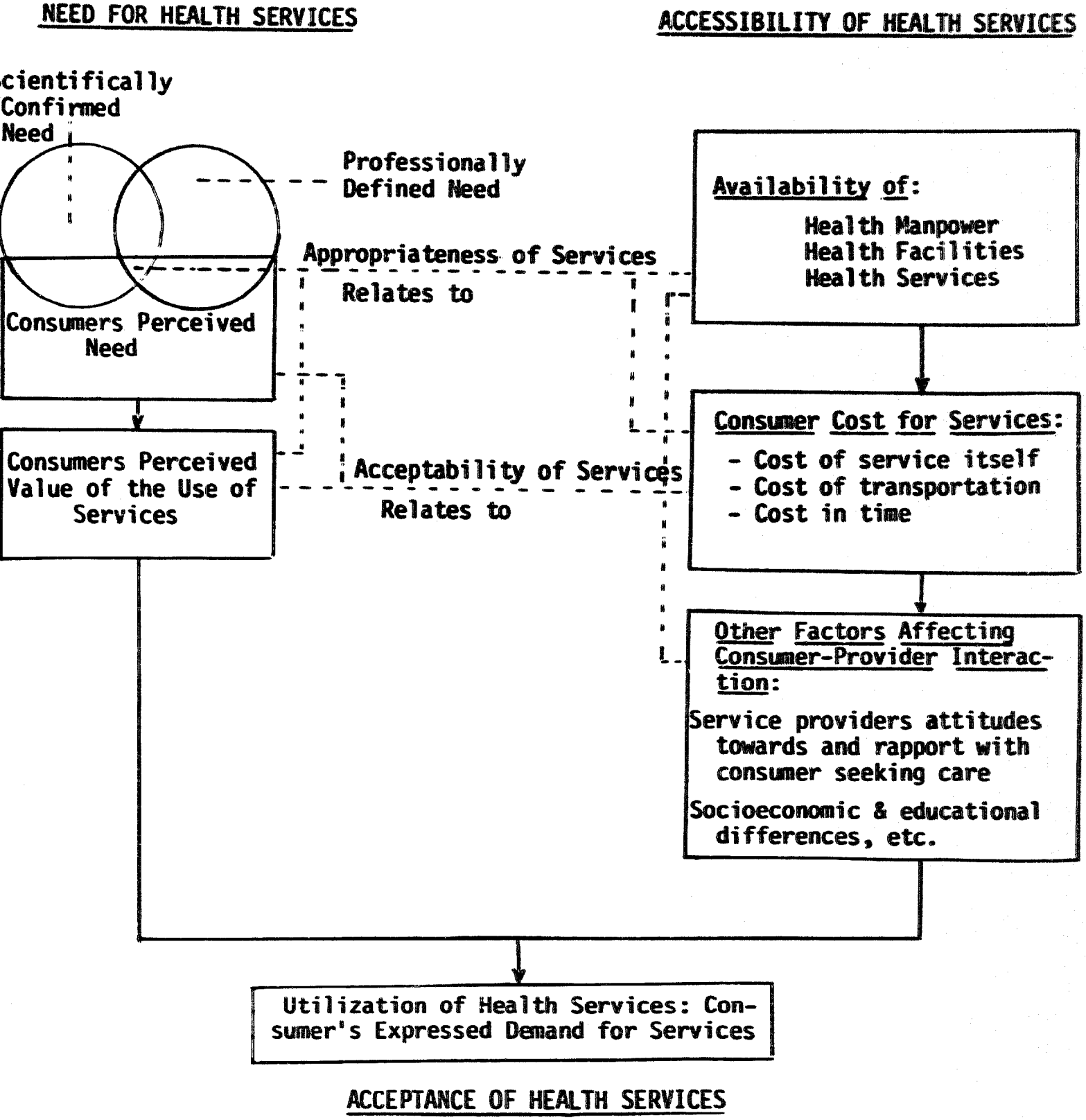
From the consumer perspective, acceptability is preceded by a perceived need for service and a positive perception of the value of using the service, and this relates to the availability of appropriate services, the cost to the consumer in terms of money and time. and a positive attitude towards the services provider which can be influenced to a great degree, by the provider's rapport with and attitudes towards the consumer.

Ultimately, the proof of accessibility and acceptability of health services is "acceptance" of health services, that is the actual utilization of health services or the expressed demand for services by consumers. Expressed demand for health services relates to the consumers and is measured by consumer utilization of available services, or the acceptance of services, particularly when the service system has the capacity to meet the expressed demand. If the capacity of the health system cannot meet the expressed demand, the level of utilization may be lower than expressed demand.

A conceptual framework of the relationships of the accessibility and acceptance of health services, including the availability of health manpower, facilities and services, the consumer costs for services, other factors affecting the consumer-provider relationship, and the need for health services is presented in Figure 1. A prerequisite to utilization of health services (or the expressed demand) by consumers is the consumers' perceived need for service and the value they place on the utility of available services. Consumers' perceived needs are generally a response to acute or specific episodes or events, such as illness or pregnancy. The consumers' perceived needs for health services may or may not conform to scientifically confirmed needs or professionally defined needs. Scientifically confirmed need for health services refer to those needs which can be objectively confirmed by scientific measurements, such as anthropometric measurements confirming undernutrition and the need for nutrition services, or biological measurements which may confirm the need for communicable disease control services. Professionally defined need for health services refers to those needs identified and acknowledged by health professionals which frequently emphasize or, at least, include health promotion and disease prevention services, in addition to medical care services. Whereas health professionals generally emphasize disease

Figure 1

Conceptual Framework of the Relationships Between the Population's Need for Health Services and Access to Services, and the Acceptability and Acceptance (Utilization) of Health Services



## MEASURES OF ACCESSIBILITY AND ACCEPTANCE OF SERVICES

For purposes of Lampang Project evaluation, the major measures of access to and acceptance of health services concern: the availability of the various types of health workers and health facilities; the distribution of health workers and facilities geographically; the ratios of health workers to the rural population; the costs to consumers of available services; and the rates of utilization of services by both the general and the target populations. The specific measures of accessibility and acceptance of services are summarized below.

(1) Availability of Services

The number and distribution of health manpower, including:

- Health post volunteers; proportion of villages with HPVs, and HPV-to-population ratio.
- Traditional birth attendants; proportion of villages with TBAs, and TBA-to-population ratio.
- Village health communicators; proportion of villages with VHC, and VHC-to-population ratio.
- Wechakorn;proportions of health centers, midwifery centers and district hospitals with wechakorn, and wechakorn-to-population ratio.
- Government midwives and midwife-to-population ratio.
- Sanitarian health workers, and sanitarian-to-population ratio.
- Nurses and nurse-to-population ratio.
- Physicians and physician-to-population ratio.

The number and distribution of health facilities, including:

- Village health posts, and proportion of villages with health post.
- Village child nutrition centers, and proportion of villages with CNCs.
- Midwifery centers, and proportion of villages and subdistricts with midwifery centers.
- Subdistrict health centers, and proportion of subdistrict with health centers.
- District hospitals; and proportion of districts with hospital.

- Provincial hospital beds; and hospital beds-to-population ratio.

(2) Other Factors of Consumer Access to Health Services

- The cost of drugs, supplies, services.
- The cost of transportation to health facil ies.
- The travel time to health facilities.

(3) Acceptance (Utilization) of Services

General population and rural target population served:

- Proportion of estimated total illness cases treated by government-supported providers in the past year.
- Proportion of each target population served by government-supported providers in the past year.

Maternal/child health services utilization:

- Proportion of total deliveries which were attended by Lampang's trained personnel.
- Proportion of total women delivering who received prenatal care.
- Proportion of total number of mothers receiving postnatal care.
- Proportion of target group children who received immunization with BCG, DPT, and OPV.

Family planning services utilization:

- Family planning practice prevalence.
- Current FP practice prevalence by source of FP services.
- Source of FP service for currently practicing eligible target group women.

Nutrition services utilization:

- Nutrition services coverage of children under age 6.
- Proportion of total preschool children enrolled in child nutrition centers

## SOURCES OF DATA

Three major sources provided the data used to assess change in access to and acceptance of health services in Lampang: the provincial health information system; the consumer survey component of the Task Analysis; and the Project Community Health Survey.

### Data from the Provincial Health Information System

All information concerning numbers and locations of health workers and facilities, some demographic data, and service statistics from various types of government-supported health providers and facilities came from sources within the provincial government network.

Lampang population data was provided by the provincial vital registration office and by the national statistics office. Only total provincial population figures and population by district were available; no age breakdowns of the population were available.

### Task Analysis Data

The Task Analysis Surveys were primarily concerned with measuring the performance of health workers in the different types of rural health facilities. However, one part of these surveys was a survey of the consumers who came to the facilities for service. The consumer survey covered large samples of consumers, and included information concerning distance and time required to travel for service, mode of transport used, cost of services received, and perceptions about the service providers. This set of data is a useful complement to the major source of data used in this monograph, the Project Community Health Survey.

### Community Health and Nutrition Survey

The Project Community Health Surveys provided the largest body of data concerned with the population's characteristics, illness and reproductive history, health environment and health behavior. More specifically, the survey questionnaires included items concerning: socio-demographic characteristics; household environmental conditions; illness and illness care in previous two weeks; history of pregnancies and outcomes; and health service utilization by target groups.

# CHAPTER 2

## AVAILABILITY OF HEALTH SERVICES IN LAMPANG, 1974-1979

When the details of the Lampang Project were being planned before operations began in 1974, the population of the province had fewer governmental health services available than the population of Thailand had available as a whole. A much smaller proportion of Lampang's districts and subdistricts had health facilities, and the ratios of available physicians, nurses, and hospital beds to the population were much lower than the national average, as indicated in Table 1.

Table 1

Comparison of Governmental Health Manpower and Health Facilities in Thailand and in Lampang Province, 1973

| Health Manpower & Facilities | Thailand | Lampang Province |
|---|---|---|
| Health Manpower | | |
| Physician/Pop. ratio | 9/100,000 | 3/100,000 |
| Nurse/Pop. ratio | 20/100,000 | 9/100,000 |
| Midwife/Pop. ratio | 9/100,000 | 10/100,000 |
| Sanitarian / Pop. ratio | 7/100,000 | 5/100,000 |
| Health Facilities | | |
| Districts with Health Centers | 45% | 33% |
| Subdistricts with Health Centers | 57% | 35% |
| Villages with Midwifery Centers | 4% | 6% |
| Hospital Bed / Pop. ratio | 91/100,000 | 48/100,000 |

Source: Ministry of Public Health

prevention and health promotion services, there is considerable overlap between the perceptions of health care consumers and health care providers concerning the need for care when illness or injury occur, for pregnancy and childbirth, and for family planning services. The consumer and the health professional perceptions of the need for preventive measures such as immunizations, nutritional and feeding care, safe water supply, and appropriate sanitation, on the other hand, may be much less congruent. Therefore professionally defined needs frequently exceed levels of consumer preceived needs.

These concepts and terms are further elaborated in reviewing several major factors that affect the consumer-provider interaction with particular reference to the Thai setting.

Specific Factors Affecting Acceptance of Available Health Services

There are several specific factors that may determine how consumers interact with the available health care system. Some of these are:

(1) The need for health care as perceived by the potential consumer;

(2) The potential consumer's perceptions and beliefs about the health care alternative available;

(3) The factors affecting the potential user's access to available health care alternatives; and

(4) The characteristics of the health care providers and facilities.

The consumer's perceived need for health care most frequently is an illness, an injury, a psychological condition, pregnancy or childbirth, a desire to limit the number of children, and less frequently, the desire for immunizations or improved environmental conditions (water supply and waste disposal). When an individual perceives the need to do something about one of these conditions, he or she is likely to seek health care.

The health care provider ultimately chosen by the person in need is first of all determined by the alternatives available. These might be either private or government sector providers, either modern or traditional. But the simple availability of health care providers is only one factor. The final choice and utilization of a given provider is also affected by:

- The nature of the individual's need. If the need is for medical care, the range of providers is broad. If the need is for care at childbirth or for sterilization, the range of providers is more limited.

- The severity of the need. People injured seriously in an accident would choose to be taken directly to a hospital. Few would consider going to an injectionist or a herbalist.
- The individual's knowledge of, and beliefs about the various providers available, influenced by his or her social, economic and cultural background.
- The distance the individual must travel, travel time required, cost of travel, and available transport.
- The perceived quality of the provider and value of his/her array of services as perceived by the consumer.
- The personal manner and empathy the provider shows to his clients.
- The amount of waiting time required before being served.
- The cost of services provided.
- The opinions of friends, relatives, and others with influence.

When a rural villager experiences a health problem, he may follow one of several courses. If the problem is a minor illness or injury, he may treat himself. Or, he may take no action and seek no assistance. Most frequently, the rural villager in need will seek care from one of the many alternative providers in the community. The range of providers is broad, and includes both government and private sector practitioners, providers using modern and traditional methods (sometimes in combination), and professionally trained and indigenous practitioners.

Figure 2 graphically summarizes some of the common types of health needs for which villagers seek care, and the alternative providers from which they may choose when seeking care.

It has been the role of health care providers, particularly those within the government or public health care sector, to stimulate an increase in the population's awareness of the broader community health care needs, and to stimulate utilization of a wider range of available services which could protect and improve the health of the community. This has also been a major objective of the Lampang Project and defines the framework for assessing potential consumer health services that have been made available.

## Figure 2

### Factors Affecting Interactions Between Potential Consumers and Providers of Health Services

A potential user may be in need of health care because of:

| Condition/Event Determining Need | Potential Consumers |
|---|---|
| 1) Illness/injury/psychogical problem | - Any individual in population |
| 2) Pregnancy/childbirth/maternal care | - Women of reproductive age (roughly 15-44) |
| 3) Desire to limit family size | - Couples with women of reproductive age |
| 4) Child health protection (nutrition monitoring, immunizations) | - Preschool or school children |
| 5) Other health protection (immunizations, etc.) | - Any individual in population |
| 6) Environmental protection - water, sanitation | - All families |

**Available Health Care Alternatives:**

| Private Sector Providers | | Government-Supported Providers | |
|---|---|---|---|
| Mainly Rural Locations | Mainly Town/City Locations | Mainly Town/City Locations | Mainly Rural Locations |
| - Drug shops | Private MD clinics[a] | Provincial hospitals | - District hospitals |
| - Itinerant drug sellers | Private hospitals | University hospital | - Subdistrict health centers |
| - Herbalists | Pharmacies | Hospitals of other ministries | - Midwifery centers |
| - Traditional midwives | Clinics of non-MD practitioners | | - Child nutrition centers |
| - Occult practitioners | | | - Community health volunteers |
| - Traditional massage providers | | | - Mobile teams |
| - Religious healers | | | |
| - Private village volunteers | | | |

[a]Many government physicians also have private clinics outside official hours.

## AVAILABILITY OF HEALTH MANPOWER IN LAMPANG, 1974-1979

The major gap in the capacity of the government health delivery system to reach and serve the rural population concerned the relative unavailability of health personnel at the periphery of the health system -- the district level, the subdistrict level, and the village level. Thus, the major emphasis of the Lampang Project was in the development of health manpower to serve at these levels: wechakorn paraphysicians for district and subdistrict levels, and three types of community health volunteers for the village level. But the numbers of physicians, nurses and the allied professions serving in rural areas were also low.

Table 2 summarizes the numbers of Lampang provincial health personnel and their distribution within the province in late 1974 when the Project began operations. While there were 17 government physicians in Lampang, only two were located in rural areas. Of the 48 nurses, only three were in rural areas, and only three nurse aides of a total of 34 were in rural areas. Rural health services were provided primarily by 75 government midwives and 51 sanitarian health workers serving in district and subdistrict health centers and village midwifery centers. Physicians, nurses and nurse aides were concentrated in the municipality where the Provincial Hospital is located. Government midwives and sanitarian health workers were the predominant types of health workers serving in Lampang's rural areas where 93.2% of the provincial population resided.

Table 3 provides a clearer picture of the ratios of these personnel to the population of Lampang in 1974. There were ten times more physicians per 100,000 population for the whole province than for the rural areas of the province. There were sixteen times more nurses per 100,000 population for the province as a whole than for the rural areas. These disproportionate ratios, however, should not detract from the fact that hospital-based physicians, nurses and nurse aides were serving some of the rural population, at least those who were willing to spend the time and money to come from their homes in the rural areas to the Provincial Hospital. But clearly, travel distance and costs are two important factors influencing the accessibility of health services.

Table 2

The Number and Distribution of Lampang Provincial Health Personnel in 1974

| Areas of Lampang | Types of Provincial Health Personnel | | | | | |
|---|---|---|---|---|---|---|
| | Physicians | Wechakorn | Nurses | Nurse Aides | Midwives | Sanitarians |
| Lampang Province Total | 17 | - | 51 | 37 | 76 | 59 |
| Municipality | 15 | - | 48 | 34 | 0 | 8 |
| Prov. Health Office | 1 | - | 3 | 0 | 0 | 8 |
| Provincial Hospital | 14 | - | 45 | 34 | 0 | 0 |
| Lampang Rural Areas | 2 | - | 3 | 3 | 76 | 51 |
| Hang Chat ($E_1$) | 0 | - | 0 | 0 | 12 | 9 |
| Muang(includes Mae Moh) | 0 | - | 0 | 0 | 11 | 6 |
| Koh Kha | 0 | - | 0 | 0 | 7 | 3 |
| Thern | 1 | - | 1 | 1 | 7 | 3 |
| Mae Prik | 0 | - | 0 | 0 | 4 | 5 |
| Sob Prab | 0 | - | 1 | 0 | 3 | 2 |
| Serm Ngam | 0 | - | 0 | 0 | 3 | 2 |
| $E_2$ Subtotal | 1 | - | 2 | 1 | 35 | 21 |
| Ngao | 0 | - | 0 | 0 | 7 | 7 |
| Jae Hom | 1 | - | 1 | 2 | 9 | 3 |
| Wang Neua | 0 | - | 0 | 0 | 5 | 4 |
| $E_3$ Subtotal | 1 | - | 1 | 2 | 21 | 14 |
| $C_1$ Mae Tah | 0 | - | 0 | 0 | 8 | 7 |

While there was only one physician for an average of 296,681 rural residents and only one nurse for 197,788 rural residents of Lampang, there was one government midwife for 7,807 rural residents and one sanitarian health worker for 11,635 rural residents of Lampang. As was seen in Table 2, the midwives and sanitarian health workers were distributed more evenly through the districts, and they were, therefore, much closer to the consumers of health services.

Table 3

Ratios of Provincial Health Personnel
to Population in Lampang in 1974

| Area/Population | Lampang Province/636,580 | | Lampang Rural Areas/593,363 | |
|---|---|---|---|---|
| | Number | Ratio | Number | Ratio |
| Physicians<br>Physician: Population | 17 | 1:37,446 or,<br>3/100,000 Pop. | 2 | 1:296,681 or,<br>0.3/100,000 Pop. |
| Nurses<br>Nurse: Population | 51 | 1:12,482 or,<br>8/100,000 Pop. | 3 | 1:197,788 or,<br>0.5/100,000 Pop. |
| Nurse Aides<br>Nurse Aide: Population | 37 | 1:17,205 or,<br>6/100,000 Pop. | 3 | 1:197,788 or,<br>0.5/100,000 Pop. |
| Government Midwives<br>Midwife: Population | 76 | 1:8,376 or,<br>12/100,000 Pop. | 76 | 1:7,807 or,<br>13/100,000 Pop. |
| Sanitarian<br>Health Workers<br>Sanitarian: Population | 59 | 1:10,789 or,<br>9/100,000 | 51 | 1:11,635 or,<br>9/100,000 |

While government midwives and sanitarian health workers were in closer touch with rural residents, their skills were limited and they were unable to fully address the major area of demand for service -- medical care. Training in medical care was therefore provided for government midwives, sanitarian health workers, nurses and nurse aides, to address the consumer's perceived need for medical care, and to use this as a "spearhead" for introducing integrated rural health services.

Even with medical care training and additional public health training provided to these government health workers by the Project's wechakorn paraphysician training program, government midwives and sanitarian health workers were too few to provide needed primary care services close to the homes of rural residents. The development of community health volunteers at the village level was another major focus of Project effort during the first five years of operations. A total of 918 health post volunteers were trained to serve in all villages of Lampang. There were 5,359 village health communicators and 352 traditional midwives also trained to provide village-level health information and other limited health services in coordination with the health post volunteers.

Of the 92 midwives, sanitarians, nurses, and nurse aides trained as wechakorn paraphysicians, 77 were assigned to rural health facilities; 72 of these were stationed at village-level midwifery centers and subdistrict-level health centers and 5 were stationed at district hospitals. Fourteen nurse wechakorn were stationed at the Provincial Hospital and one was assigned to the Regional Midwifery Training Center. (See Monograph 2, Volume II, for a full discussion of community health volunteers, and Monograph 3 in Volume II for a full discussed of wechakorn trained by the Project.)

Table 4 provides an overview of the numbers and distribution of provincial health personnel and community health volunteers in Lampang at the end of 1979. The most notable addition is the community health volunteers who form the primary health care network at the village level. Training wechakorn did not add new workers to the health care system, but instead expanded the functions of health workers already available through the one-year, competency-based wechakorn training program. Midwives and sanitarians who were trained as wechakorn tended to give a major portion of their time to providing medical care services to meet the expressed demand. But they also continued to promote and provide midwifery and sanitarian services. The column for midwives and sanitarians in Table 4 excludes those midwives and sanitarians who were trained as wechakorn; but in reality, wechakorn do continue to practice their former skills and could be included in the number of midwives and sanitarians.

At the same time that the functions of health workers expanded during the first five years of Project operations, the numbers of health workers also increased as a result of MOPH planning and implementation of nationwide programs to increase the availability of health personnel. The number of physicians in Lampang increased to a total of 41 by 1979, largely as a result of the Lampang Provincial Hospital expansion to become a regional referral hospital. But, at the same time,

## Table 4

The Numbers and Distribution of Lampang Provincial Health Personnel and Community Health Volunteers - 1979

| | Physicians | Wechakorn | Nurses[a] | Nurse Aides[b] | Midwives[c] | Sanitarians[d] | HP[e] | VHC[f] | TBA[g] |
|---|---|---|---|---|---|---|---|---|---|
| Lampang Province Total | 41 | 92 | 83 | 176 | 59 | 39 | 823 | 5,340 | 346 |
| Prov.Health Office(+Midwifery Trng. Center) | 2 | 1 | 8 | 2 | 0 | 9 | - | - | - |
| Provincial Hospital | 32 | 14 | 65 | 154 | 0 | 0 | - | - | - |
| Lampang Rural Areas | 7 | 77 | 10 | 20 | 59 | 30 | 823 | 5,340 | 346 |
| Hang Chat($E_1$) | 1 | 8 | 3 | 7 | 9 | 4 | 75 | 652 | 44 |
| Muang | 0 | 12 | 0 | 3 | 12 | 3 | 141 | 1,912 | 25 |
| Mae Moh | 0 | 2 | 0 | 0 | 2 | 1 | 29 | 217 | 25 |
| Koh Kha | 0 | 6 | 0 | 0 | 6 | 4 | 69 | 727 | 30 |
| Thern | 1 | 9 | 3 | 3 | 10 | 4 | 87 | 467 | 45 |
| Mae Prik | 0 | 3 | 0 | 0 | 2 | 1 | 21 | 167 | 12 |
| Sob Prab | 1 | 4 | 0 | 0 | 5 | 1 | 34 | 310 | 29 |
| Serm Ngam | 1 | 4 | 0 | 0 | 3 | 1 | 36 | 311 | 35 |
| $E_2$ Subtotal | 3 | 40 | 3 | 6 | 40 | 15 | 417 | 4,111 | 201 |
| Ngao | 1 | 9 | 2 | 4 | 2 | 1 | 45 | 0 | 13 |
| Jae Hom | 1 | 8 | 1 | 3 | 3 | 5 | 104 | 282 | 23 |
| Wang Neua | 1 | 6 | 1 | 0 | 4 | 3 | 58 | 295 | 13 |
| $E_3$ Subtotal | 3 | 23 | 4 | 7 | 9 | 9 | 207 | 577 | 49 |
| $C_1$ Mae Tah | 0 | 6 | 0 | 0 | 1 | 2 | 124 | 0 | 52 |

(a) Excludes 14 nurses trained as wechakorn; total number of nurses is 97.
(b) Excludes 3 nurse aides trained as wechakorn; total number of nurse aides is 179.
(c) Excludes 51 midwives trained as wechakorn; total number of midwives is 110.
(d) Excludes 24 sanitarians trained as wechakorn; total number of sanitarians is 63.
(e) Represents the number of active HPVs of the total trained (918), including 873 trained by the LHDP training staff and 45 trained by the CBFPS training staff.
(f) Represents the number of active VHCs of the total trained (5,359).
(g) Represents the number of active TBAs of the total trained (352).

Table 5

Ratios of Provincial Health Personnel and Community Health Volunteers to the Population of Lampang in 1979

| Area/Population | Lampang Province/655,933 | | Lampang Rural Areas/612,9 | |
|---|---|---|---|---|
| | Number | Ratio | Number | Ratio |
| Physicians<br>Physician: Population | 41 | 1:16,000 or,<br>6/100,000 Pop. | 7 | 1:87,563 or,<br>1/100,000 Pop. |
| Nurses<br>Nurse: Population | 83 | 1:7,904 or,<br>13/100,000 Pop. | 10 | 1:61,294 or,<br>2/100,000 Pop. |
| Nurse Aides<br>Nurse Aide: Population | 176 | 1:3,727 or,<br>27/100,000 Pop. | 20 | 1:30,647 or,<br>3/100,000 Pop. |
| Government Midwives<br>(includes 51 trained as wechakorn)<br>Midwife: Population | 110 | 1:5,963 or,<br>17/100,000 | 110 | 1:5,572 or,<br>18/100,000 |
| Sanitarian Health Workers<br>(includes 24 trained as wechakorn)<br>Sanitarian: Population | 63 | 1:10,413 or,<br>10/100,000 Pop. | 54 | 1:11,350 or,<br>9/100,000 Pop. |
| Wechakorn<br>Wechakorn: Population | 92 | 1:7,130 or,<br>14/100,000 Pop. | 73 | 1:7,960 or,<br>13/100,000 |
| Health Post Volunteers<br>HPV: Population | | a<br>a | 918 | 1:668 or,<br>150/100,000 |
| Active HPVs<br>Active HPV: Population | | a<br>a<br>a | 823 | 1:745 or,<br>134/100,000 |
| Health Communicators<br>Active VHC: Population | | a<br>a | 5,340 | 1:115 or,<br>870/100,000 |
| Traditional Birth Attendants<br>Active TBA: Population | | a<br>a | 346 | 1:1,772 or,<br>56/100,000 |

[a]Volunteers only deployed in rural areas.

the MOPH plan for increasing physician deployment to rural areas was being implemented and, by 1979, Lampang had 7 physicians working in district hospitals (four of which were newly built).

While the numbers of nurses increased from 51 in 1974 to 83 in 1979, only an additional seven nurses were placed in rural health facilities. Of the 176 nurse aides in Lampang in 1979, 20 were in rural health facilities, increasing from only three in 1974.

One of the most notable changes in the availability of government health personnel in rural areas was in the number of midwives, increasing from a total of 76 midwives in 1974 to a total of 110 midwives in 1979, of which 51 were trained by the LHDP to be wechakorn-midwives. The number of sanitarian health workers increased from 59 in 1974 to a total of 63 in 1979, of which 24 were trained by the LHDP to be wechakorn-sanitarians.

The 1979 ratios of government health personnel and community health volunteers to the population in Lampang are summarized in Table 5. While the ratio of physicians to population in rural areas increased from 1:296,681 in 1974 to 1:87,563 in 1979, the absolute increase was only five, increasing from a total of two to seven physicians; therefore, coverage of the rural population with physicians' services was still scanty at best. The greatest improvement in medical care coverage of the population, expecially in terms of geographic distribution of services, resulted from training the 77 wechakorn paraphysicians for service in rural areas. With the addition of more government midwives, the ratios of government midwives to population in rural areas (including those who had received wechakorn training) improved from 1:7,807 in 1974 to 1:5,572 in 1979. The addition of relatively few new sanitarian health workers barely kept pace with population growth, resulting in minor changes in the sanitarian-to-population ratios.

The ratio of wechakorn to population in Lampang in 1979 was 1:7,960 in rural areas, and 1:7,130 for the whole Province. Community health volunteers provided the most complete coverage of the rural population, as volunteer-to-population ratios indicate. In the rural areas of Lampang, there is now one active HPV for every 745 rural villagers, one active village health communicator for every 115 rural residents; and one TBA for every 1,772 rural residents. This represents 134 active HPVs per 100,000 rural residents; 870 health communicators per 100,000 rural residents; and 56 active traditional birth attendants per 100,000 rural residents in Lampang. For community health volunteers to remain active,

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however, assumes that the government health care system will capably guide, stimulate, coordinate and manage support for community health volunteers in every village of the province. This requires that the government health workers assigned to rural areas are adequate in number, are appropriately trained and stimulated to support community health volunteers, are properly distributed geographically and are in appropriate ratios to community health volunteers in each area.

While the development of appropriately trained health manpower for the various levels of health care delivery at the rural periphery was the major focus of Project effort, the MOPH commitment to expansion of rural health facilities provided additional momentum for an improved and strengthened health care delivery system.

## AVAILABILITY OF HEALTH FACILITIES IN LAMPANG, 1974-1979

When the Project began operations in 1974, the province had only 11 child nutrition centers, 31 midwifery centers, 36 subdistrict health centers, and 2 district hospitals to serve Lampang's rural areas. By 1979, there were 100 child nutrition centers and 918 health posts at the village level, 30 midwifery centers, 30 subdistrict health centers, and 7 district hospitals serving Lampang's rural areas. These increases in rural health facilities are summarized in Table 6.

Table 6

Rural Health Facilities Development in Lampang Province, 1974 to 1979

| | 1974 | 1979 | % Change |
|---|---|---|---|
| Village Health Posts | 0 | 918 | ++++ |
| Village Child Nutrition Centers | 11 | 100 | +809% |
| Village Midwifery Centers | 31 | 30 | -3% |
| Subdistrict Health Centers | 36 | 70 | +94% |
| District Hospitals | 2 | 7 | +250% |
| Prov. Hosp. Mobile Unit | 0 | 1 | ++++ |
| Prov. Hosp. Comm. Health Dept. | 0 | 1 | ++++ |

Table 7

The Numbers and Distribution of Rural Health Facilities in Lampang Province, 1974 and 1979

| Areas of Lampang Province | Number of Subdistricts | | Number of Villages | | District Hospitals | | Subdistrict Health Centers | | Village Midwifery Centers | | Child Nutrition Centers | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1974 | 1979 | 1974 | 1979 | 1974 | 1979 | 1974 | 1979 | 1974 | 1979 | 1974 | 1979 |
| $E_1$ (Hang Chat) Subtotal | 7 | 7 | 61 | 61 | 0 | 1 | 7 | 6 | 3 | 3 | 6 | 17 |
| Muang(including Mae Moh,excluding Municipality) | 12 | 15 | 125 | 126 | (Prov.Hosp) | | 5 | 17 | 6 | 7 | 1 | 23 |
| Koh Kha | 6 | 6 | 53 | 56 | 0 | 0 | 2 | 7 | 4 | 4 | 2 | 8 |
| Thern | 8 | 8 | 52 | 53 | 1 | 1 | 0 | 8 | 5 | 4 | 0 | 13 |
| Mae Prik | 3 | 3 | 20 | 20 | 0 | 0 | 3 | 3 | 1 | 1 | 0 | 1 |
| Sob Prab | 4 | 4 | 27 | 27 | 0 | 1 | 1 | 5 | 2 | 0 | 0 | 4 |
| Serm Ngam | 3 | 3 | 28 | 29 | 0 | 1 | 2 | 3 | 1 | 0 | 1 | 3 |
| $E_2$ Subtotal | 36 | 39 | 305 | 311 | 1 | 3 | 16 | 43 | 19 | 13 | 4 | 52 |
| Ngao | 10 | 10 | 51 | 51 | 0 | 1 | 6 | 6 | 1 | 3 | 0 | 7 |
| Jae Hom | 10 | 10 | 62 | 63 | 1 | 1 | 2 | 5 | 5 | 6 | 1 | 3 |
| Wang Neua | 4 | 4 | 35 | 36 | 0 | 1 | 2 | 4 | 1 | 1 | 0 | 15 |
| $E_3$ Subtotal | 24 | 24 | 148 | 154 | 1 | 3 | 10 | 15 | 7 | 10 | 1 | 25 |
| $C_1$ Mae Tah | 8 | 8 | 60 | 66 | 0 | 0 | 6 | 6 | 2 | 1 | 0 | 6 |
| Lampang Province Total | 75 | 78 | 574 | 592 | 2 | 7 | 36 | 70 | 31 | 30 | 11 | 100 |

Table 7 summarizes the distribution of rural health facilities in Lampang in 1974 and 1979, and Table 8 summarizes the changes in geographic coverage by government health facilities and village health posts from 1974 to 1979. The coverage of districts with hospital services includes both district hospitals in rural districts and the Provincial Hospital which effectively functions as a "district hospital" for the very large Muang District of Lampang.

The increased coverage of subdistricts with health centers was accomplished primarily by upgrading a number of existing midwifery centers to function as health centers. Many midwives who had been trained as wechakorn returned to their former

Table 8

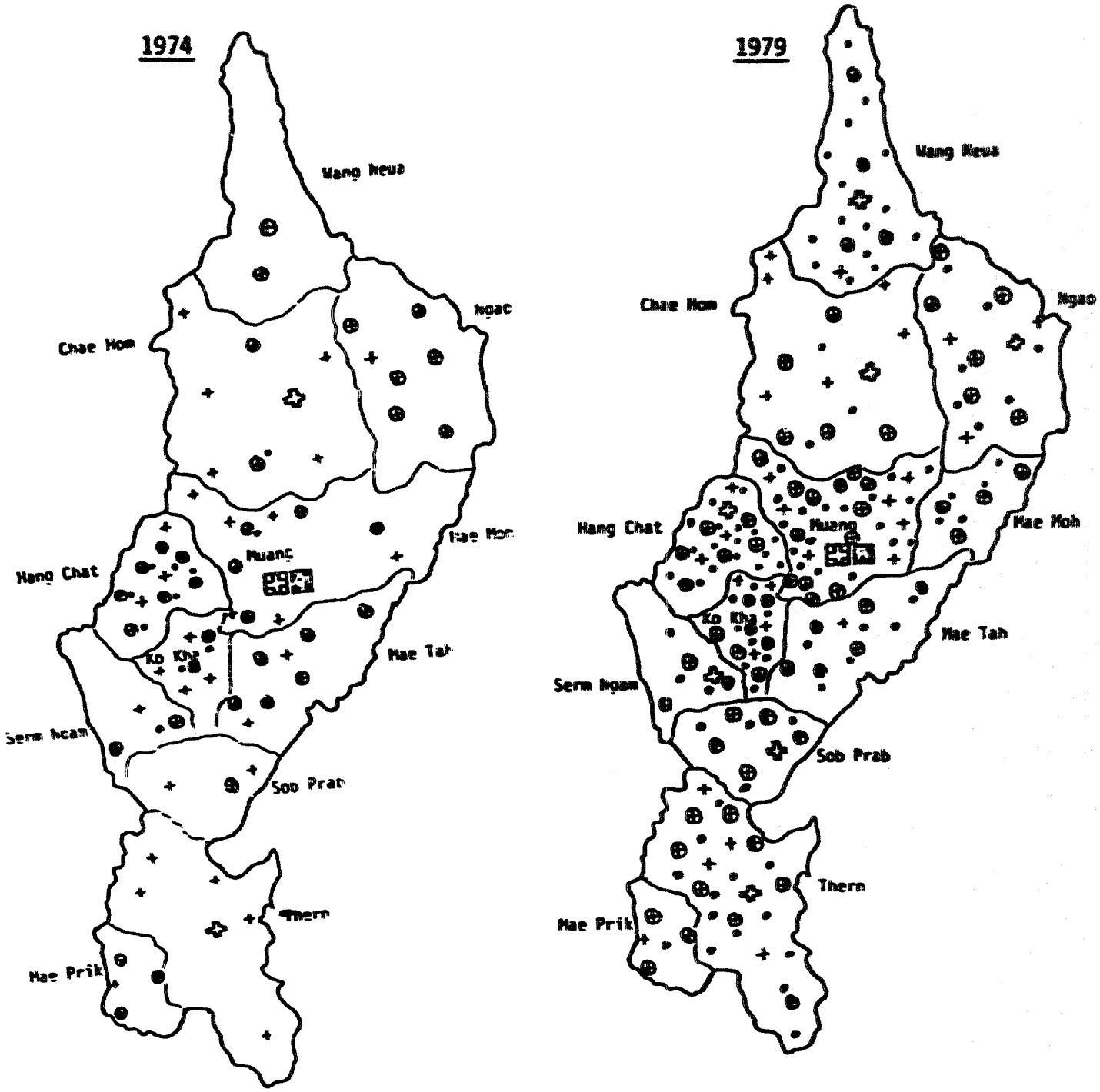
A Summary of Area Coverage by
Government Health Facilities and Village
Health Posts in Lampang Province, 1974 and 1979

| Area/Facility | 1974 Coverage | 1979 Coverage | Percent Change |
|---|---|---|---|
| Districts with hospitals | 27% | 67% | +40% |
| Subdistricts with health centers | 57% | 90% | +33% |
| Villages with midwifery centers | 5% | 5% | 0 |
| Villages with child nutrition centers (or day-care centers) | 2% | 17% | +15% |
| Villages with health posts | 0 | 100% | +100% |

midwifery centers to help expand their range of services so they could function as health centers. As midwifery centers were converted to health centers, there was a corresponding but slight decrease in coverage by midwifery centers. The most notable increase in coverage relates to the establishment of 89 new village-based child nutrition centers. Figure 3 presents a visual portrayal of the distribution of government health care facilities in Lampang Province in 1974 and 1979.

## Figure 3

**The Number and Distribution of Government Health Facilities in Lampang Province in 1974 and 1979**




| LAMPANG PROVINCIAL HEALTH SYSTEM | 1974 | 1979 |
|---|---|---|
| Provincial Health Office | 1 | 1 |
| Provincial Hospital | 1 | 1 |
| District Hospitals | 2 | 7 |
| Subdistrict Health Centers | 36 | 70 |
| Village Midwifery Centers | 31 | 30 |
| Village Child Nutrition Centers | 11 | 100 |
| Village Health Posts and HPVs | 0 | 918 |
| Village Health Communicators | 0 | 5,359 |
| Trained Traditional Midwives | 0 | 352 |

# CHAPTER 3

## ACCESSIBILITY OF HEALTH SERVICES IN LAMPANG, 1974-1979

The most complete set of data concerned with consumer access to rural health services, other than data already presented in chapter 2 on the availability of health service personnel and facilities, comes from the Project's task analysis. The hospital task analysis was done only once, and provided a limited range of data, whereas the task analysis surveys on rural health facilities covered both preintervention and postintervention conditions.

### ACCESS TO PROVINCIAL HOSPITAL SERVICES

Although the Provincial Hospital is utilized by people from all over the province (and on occasion by people from neighboring provinces), the majority of patients come primarily from areas located close to the hospital and from rural areas with convenient transportation routes. Of the 7190 patients interviewed in the hospital (94% were outpatients), 54% came from Muang District where the Provincial Hospital is located, whereas only 27% of the province's population lives in Muang District. Figure 4 shows the proportion of patients coming from each district.

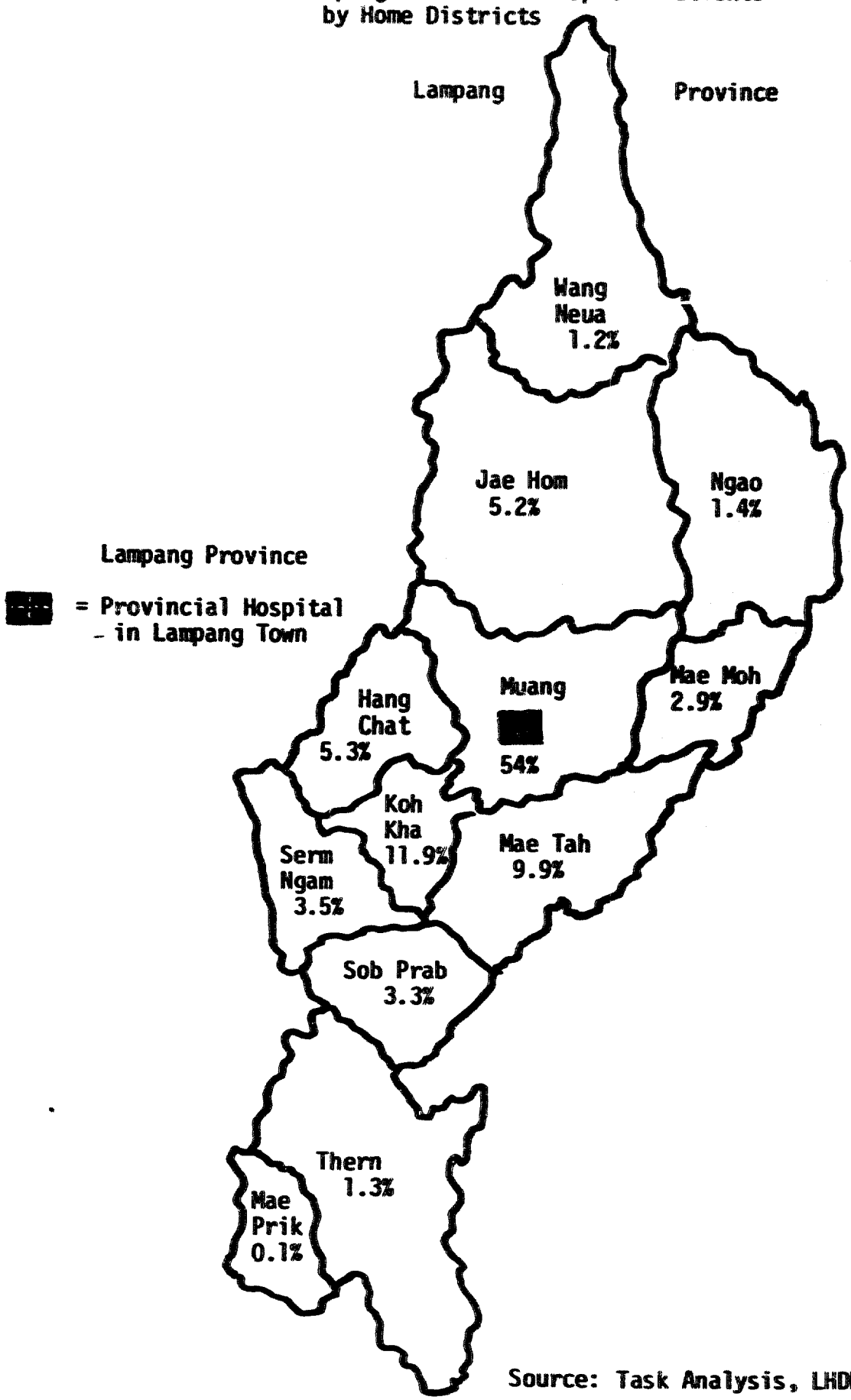
In general, the districts near the hospital -- within the radius of 25 to 30 kilometers - accounted for almost 90% of all hospital patients. The four districts most distant -- 80 to 100 kilometers from Lampang town -- accounted for only 4% of all patients.

### ACCESS TO RURAL HEALTH SERVICES

In each rural health facility (district hospitals, subdistrict health centers and midwifery centers) where Task Analysis observations were made of health workers, a systematic random sample of villagers who came for service were interviewed. In the baseline rounds, a total of 3045 consumers were interviewed. In the follow-up surveys 3295 patients were interviewed.

Figure 4

Distribution of Lampang Provincial Hospital Patients by Home Districts




Source: Task Analysis, LHDP.

Overall, between 25% and 30% of the service recipients were male, and 70% to 73% were female. More than two-thirds of patients sampled in every area were between the ages of 15 and 45. The proportion of all consumers sampled who were under age six was less than 10% in all areas.

Distance and Mode of Travel to Health Facilities

The majority of people who came to the health facilities traveled less than four kilometers. Table 9 summarizes distance traveled by consumers interviewed in the pre- and postintervention surveys. The postintervention data indicate that

Table 9

Distribution of Consumers by Distance Traveled from Home to Facility Where Service Was Received in $E_2$ Districts During Baseline and Follow-up Surveys

| Distance Traveled (kilometers) | Baseline | | Follow-up | |
|---|---|---|---|---|
| | No. | % | No. | % |
| 0-1 | 1,559 | 61.7% | 638 | 34.3% |
| 1-4 | 616 | 24.4% | 662 | 35.6% |
| 5-9 | 177 | 7.0% | 261 | 14.0% |
| Over 9 | 176 | 6.9% | 298 | 16.0% |
| Total | 2,528 | 100.0% | 1,859 | 99.9% |

[a] Slightly under 100.0% due to rounding. Source: Project Task Analysis

the proportion of consumers traveling 5 kilometers or farther has increased sharply in the postintervention period. Less than 15% of the consumers traveled 5 kilometers or farther in the baseling period, but in the postintervention surveys some 30% of consumers traveled 5 kilometers or farther.

Table 10 shows the mode of travel used to reach the health facility. In the preintervention surveys, walking was the most common form of travel to health facilities. Over 80% of the consumers either walked or rode a bicycle or a motorcycle. In the postintervention period, fewer people walked to receive care and there was a slight increase in the proportion of people who rode bicycles and motorcycles.

Table 10

Mode of Travel to Receive Health Services in $E_2$ Districts During Baseline and Follow-up Surveys

| Mode of Travel | Baseline | | Follow-up | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Walking | 1,169 | 46.2% | 710 | 38.2% |
| Bicycle | 624 | 24.7% | 541 | 29.1% |
| Motorcycle | 285 | 11.3% | 355 | 19.1% |
| Private Car | 67 | 2.7% | 37 | 2.0% |
| Public Transport[a] | 382 | 15.1% | 210 | 11.3% |
| Other | 1 | 0.1% | 6 | 0.3% |
| Total | 2,628 | 100.0% | 1,859 | 100.0% |

[a] Minibuses Source: Project Task Analysis

## Travel Time and Transportation Costs to Consumers

Table 11 shows the average amount of time spent in traveling to receive services. In both the pre- and postintervention periods, approximately 80% of all villagers who came to government health facilities for care traveled less than 30 minutes

Table 11

Time Spent in Traveling to Receive Health Services in $E_2$ Districts During Baseline and Follow-up Surveys

| Travel Time (minutes) | Baseline | | Follow-up | |
|---|---|---|---|---|
| | No. | % | No. | % |
| 0-10 | 1,396 | 55.2% | 786 | 42.3% |
| 11-30 | 652 | 25.8% | 685 | 36.8% |
| 31-60 | 368 | 14.6% | 296 | 15.9% |
| Over 60 | 112 | 4.4% | 92 | 5.0% |
| Total | 2,528 | 100.0% | 1,859 | 100.0% |

(and about half traveled 10 minutes or less). In only a few of the cases was payment for public transportation required, as over 90% of the service users walked, rode a bicycle, or used their own motorcycle.

Cost of Services to Consumers

A final measure included in the Task Analysis survey was the cost of service which was paid by the service recipient. Table 12 summarizes the range of costs paid by consumers.

Table 12

Payment for Health Services Made by Service Recipients in $E_2$ Districts (Baseline and Follow-up)

| Service Cost to Consumers (Baht) | Baseline | | Follow-up | |
|---|---|---|---|---|
| | No. | % | No. | % |
| 0-1฿ | 1,416 | 56.0% | 707 | 38.0% |
| 2-10฿ | 696 | 27.5% | 528 | 28.4% |
| 11-30฿ | 340 | 13.5% | 512 | 27.5% |
| 31-40฿ | 28 | 1.1% | 43 | 2.3% |
| Over 40฿ | 48 | 1.9% | 69 | 3.7% |
| Total | 2,528 | 100.0% | 1,859 | 99.9%[a] |

[a] Under 100% due to rounding

Source: Project Task Analysis

A large proportion of consumers at the rural health facilities paid less than one baht (five US cents) for services received (payment is made as a "donation" to the health center). 84% of all consumers in the baseline study paid under ten baht (50 US cents) for services received, and 66% of all consumers in the postintervention period paid under ten baht. Over 90% paid less than 30 baht (US$1.50) in both surveys. In the postintervention period, although the proportion of consumers paying little or nothing was 38% there appeared to be a general increase in the proportion who paid more than 10 baht for services received. Generally, payments made at rural health facilities are for "medicine", rather than for "service", and the increase in payments ranging from 10 to 30 baht may reflect the increased range and quality of medicines and supplies available at rural health facilities after the assignment of Project-trained wechakorn.

In summary, the data suggest that consumers who came to rural health facilities for services came from slightly farther distances in the postintervention period, although at least 70% came from a distance of less than 5 kilometers (2.4 miles). Although the great majority -- over 90% -- walked or rode a bicycle or motorcycle, there was a slight increase in travel costs for the proportion of consumers who used public transportation.

The previous chapter has documented the broad increase in the availability of government rural service providers. The evidence that in the postintervention period service users traveled somewhat farther and longer in time,paid a bit more for transportation and paid slightly more for services received could suggest that access to service may have become more difficult. On the other hand, these facts could also reflect the improved credibility of the service facilities and providers, and an increased consumer willingness to come from afar and pay for better medicines and care. Further analysis of utilization data should help to clarify this issue.

Access to Community Health Volunteer Services

Training health post volunteers, traditional birth attendants (TBA's) and health communicators for every village in Lampang Province was a major Project strategy to improve rural consumer access to health care. The volunteers are both socially and geographically close to the people they serve; their services are extremely low cost; and they can facilitate access to other services of government health care.

Volunteer service data and survey data provide information about access to volunteer services. Service data indicate that consumers pay, on the average, slightly more than one baht per medical care contact and 20% to 25% of consumers pay nothing. The "donation" for a one month's supply of oral contraceptives distributed by HPV's is one to three baht. The Community Health Survey indicates that 20% to 30% of all women using oral contraceptives get them from health post volunteers. In a small survey of rural contraceptive users, over 80% of those using oral contraceptives said they had chosen to get their monthly supply from the health post volunteer because the volunteers were "conveniently close".

Traditional birth attendants have historically been the most accessible health care provider for attending deliveries in the rural areas. They have not only attended deliveries at villagers' homes, but have played a "grandmother" role in helping with household tasks, have performed rites associated with childbirth, and have acted as a source of information on child care. TBA costs are

low and vary according to the means of the household receiving her services. The payments villagers make (both cash and in kind) for her services are not considered to be a payment for services, but are a donation to the memory of the TBA's original teacher. The TBA maintains a lifelong relation to the family she has served, and the family hold her in respect.

The Project strategy to train TBAs, VHC, and HPVs - community health volunteers - has built on indigenous factors in the village setting which contribute to ease of access to village-based health care. Health post volunteers live in and are familiar with the village they serve; their services are very low in cost; and they meet existing villager demands for health and family planning services.

Ultimately, perhaps the best indicator of accessibility is the response of the rural villagers to the services available. The following chapters examine the levels of utilization of these services.

CHAPTER 4

# ACCEPTABILITY AND UTILIZATION OF HEALTH SERVICES IN LAMPANG

The final proof of the acceptance of health services is the actual utilization of available services. A national survey conducted in Thailand in 1970 and numerous other sample survey data collected since then have revealed that less than 20% of those who had a need for medical care had actually sought medical care services from government medical and health care facilities. The proportion of the total population, including those who did not actively seek care, receiving any government health service might be even less. Many who interpreted the national survey data suggested several possible reasons for the low utilization of government health services: (1) the relative unavailability of health facilities and manpower; (2) in many facilities a lack of the type of services, particularly medical care services, valued by potential consumers, due to the limited training received by most midwives and sanitarian health workers.

Major aims of the Lampang Health Development Project, therefore, were to increase the availability of appropriately trained health manpower; to increase the range and availability of health services; to inform the rural population about the improved service availability and quality; to increase the actual utilization of government health services by the target populations; and to deliver the services more cost-effectively. The target populations were identified as women of childbearing age (15-44 years) and children under 6 years of age. Therefore, maternal and child health services of all types, including family planning and nutrition services, were emphasized. Similarly, a major emphasis of evaluation was to measure the changes in actual utilization of health services by women and children in the Project intervention and control areas.

Data for this analysis came primarily from the Project's Community Health Surveys and the service statistics of the Provincial Health Office. It should be noted that the intervention period was about four years between community health surveys in the $E_1$ area, and about two years in the $E_2$ area. The elapsed time between surveys in the control areas and the $E_1$ area was about four years. The $E_1$ area was a single district with a population of about 43,000 (41,366 in 1974 and

44,190 in 1979); the $E_2$ area comprised seven districts with a population of about 340,000 (338,929 in 1974, and 345,482 in 1979); $C_1$ was a single district with about 60,000 people; and $E_2$ was a single district with a population of about 45,000.

Although the Project focussed on utilization of health services by women of child-bearing age and children under age six, the Project was also interested in the utilization of health services by the whole population. Some data relating to the entire population is presented as well.

## UTILIZATION OF HEALTH SERVICES BY CHILDREN

In each sample household of the Community Health Survey, interviewers asked whether women of child-bearing age and children under age six had received any government-sponsored service in the previous year. This question aimed at directly measuring the attainment of the end-of-Project purpose: reaching two-thirds of these target groups with services provided by government health facilities and workers (including health volunteers). One year is a long period for recall, and many health care contacts may have been forgotten, particularly if the interviewee was not a target-group woman. But such recall problems would be more or less uniform in both surveys, making comparisons of change still relevant.

### Utilization of Any Service

Table 13 summarizes baseline and follow-up utilization of any service by children under age six in the year previous to the interview day.

Table 13

The Proportion of Children Under Age 6 Who Received Government Health Services During the Previous Year in Project Areas (Baseline and Follow-up)

| | Baseline | | | | Follow-up | | | |
|---|---|---|---|---|---|---|---|---|
| Area (year of survey) | Sample Number | No. of children under 6 receiving service | Proportion receiving services | Area (year of survey) | Sample Number | No. of children under 6 receiving service | Proportion receiving services | % Increase/decrease |
| $E_1$ (1975) | 1,076 | 324 | 30.1% | $E_1$ (1979) | 342 | 224 | 65.5% | +35.4% |
| $E_2$ (1977) | 1,636 | 693 | 42.4% | $E_2$ (1979) | 592 | 357 | 60.3% | +17.9% |
| $C_1$ (1975) | 772 | 330 | 42.7% | $C_1$ (1979) | 239 | 94 | 39.3% | -3.4% |
| $C_2$ (1975) | 316 | 134 | 42.4% | $C_2$ (1979) | 86 | 43 | 50.0% | +7.6% |

Source: Project Community Health Surveys

While the level of health service utilization by children in the combined $E_1$ and $E_2$ areas during baseline surveys was 37.5%, the follow-up surveys in these areas revealed that 62.2% of all children under age 6 in $E_1$ and $E_2$ had been served by Lampang's government-supported health care system.

Utilization of health services by preschool children increased in the $E_1$ area from 30.1% in the baseline survey to 65.5% in the follow-up survey, an increase of +35.4%. Child health services utilization in the $E_2$ area increased 17.9%, a change from 42.4% in the baseline survey to 60.3% in the follow-up survey. In the $C_1$ area, however, the proportion of preschool children receiving services decreased 3.4%, falling from 42.7% in the baseline survey to 39.5% in the follow-up survey. During the same period, health service utilization by children in the $C_2$ area increased +7.6%, rising from 42.4% in the baseline survey to 50.0% in the follow-up survey. In both project intervention areas, utilization of government-supported health services by preschool children rose to significantly higher absolute levels than in the control areas; moreover, the project areas also showed much larger proportionate increase between the baseline and follow-up measurements than did the control areas.

The overall differences between the Project service areas and the control areas are equally apparent when the volume of government-supported services received per 1,000 children under age six is examined. Table 14 shows that although the average

Table 14

Number of Government-Sponsored Services Provided per 1,000 Children Under Age Six in Project Areas in 1974 and 1979

| Area | No. Services per 1,000 Target Group Children | | % Change |
|---|---|---|---|
| | Baseline (1974) | Follow-up (1979) | |
| $E_1$ | 409 | 2,003 | +390 |
| $E_2$ | 636 | 1,017 | +60 |
| $C_1$ | 512 | 427 | -17 |
| $C_2$ | 632 | 750 | +19 |

Source: Provincial Health Office Service Records.

numbers of services received per 1,000 target group children were roughly similar in the baseline period, they had increased substantially in both Project areas during the follow-up period. On the other hand, there was a decrease in the $C_1$ control area, and only a small increase in the $C_2$ control area.

The very substantial increase in the proportion of all children who received services in the Project areas was not confined to children in any one economic level.

Table 15 shows the change in the pattern of service utilization by children of different economic status. In the baseline period , service utilization among preschool children was low for all children, and particularly for those in the poor

Table 15

Proportion of Children Under Age 6 Who Received Government-Supported Health Services in the Previous Year in Project Areas, by Economic Status (Baseline and Follow-up)

| Area | No. of Sample Children | | % of children using services, by economic status | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | All Children | | Poor Children | | Middle Level Children | | Well-to-do Children[a] | |
| | BL | FU | BL | FU | BL | FU | BL | FU | BL | FU |
| $E_1$ | 1,076 | 342 | 30.1 | 65.5 | 29.2 | 66.9 | 30.5 | 63.9 | 32.3 | 75.0 |
| $E_2$ | 1,636 | 592 | 42.4 | 60.3 | 38.6 | 57.0 | 43.1 | 62.1 | 49.2 | 63.8 |
| $C_1$ | 772 | 239 | 42.7 | 39.5 | 43.9 | 44.3 | 41.8 | 37.3 | 70.0 | 22.2 |
| $C_2$ | 316 | 86 | 42.4 | 50.0 | 37.0 | 47.7 | 46.4 | 54.1 | 100.0 | 40.0 |

[a] Generally quite small numbers in this group

and middle-level households. The sharp increases in child service utilization occurred in all economic groups in the $E_1$ and $E_2$ areas; this trend was not generally true in the control areas.

Table 16 shows the types of services received by preschool children who were served by government-supported sources in the previous year. The most frequently used services in follow-up surveys were nutrition, well child and "other" child services. The proportion of children who received medical care services increased in all areas, but the increase was minimum in the $E_1$ Project area. In the follow-up period, 19 to 21% of preschool children in the Project areas and 16 to 17% of preschool children in control areas had received medical care services in the previous year.

The proportions of children who had received immunizations in the follow-up period were generally higher in the Project areas than in the control areas; however, there was a decline from the baseline levels in immunizations for all areas

Table 16

Proportion of All Children Under Age 6 Who Received Government-Supported Services in Project Areas, by Type of Service (Baseline and Follow-up Surveys)

| Child Health Services | Area | Baseline | Follow-up | % Increase/ Decrease |
|---|---|---|---|---|
| A. Any Child Health Services | $E_1$ | 30.1% | 65.5% | +35.4% |
| | $E_2$ | 42.4% | 60.3% | +17.9% |
| | $E_1+E_2$ | 37.5% | 62.2% | +24.7% |
| | $C_1$ | 42.7% | 39.5% | -3.2% |
| | $C_2$ | 42.4% | 50.0% | +7.6% |
| B. Medical Care Services | $E_1$ | 19.1% | 20.5% | +1.4% |
| | $E_2$ | 10.4% | 18.8% | +8.4% |
| | $C_1$ | 12.4% | 16.7% | +4.3% |
| | $C_2$ | 7.6% | 16.3% | +8.7% |
| C. Immunization Services | $E_1$ | 13.1% | 24.9% | +11.8% |
| | $E_2$ | 33.7% | 23.3% | -10.4% |
| | $C_1$ | 26.6% | 20.9% | -5.7% |
| | $C_2$ | 30.6% | 10.5% | -20.1% |
| D. Nutrition, Well Child, and Other Child Health Services | $E_1$ | 3.1% | 51.7% | +48.6% |
| | $E_2$ | 5.9% | 41.8% | +35.9% |
| | $C_1$ | 7.3% | 12.5% | +5.2% |
| | $C_2$ | 15.1% | 38.3% | +23.2% |

except the $E_1$ district, where a 12% increase occurred. These survey results are surprising, as the Ministry of Public Health had given special nationwide emphasis to child immunizations in the Project's third year of implementation, a year or more before the follow-up survey.

Primary immunizations are most relevant to children under two years of age, and the declining birth rate that has been evident has reduced the proportion of preschool children who are under age two. This, in turn, may be partially responsible for the observed changes in immunization coverage

Although the proportions of children who had a wellchild service contact (child physical examination or hygiene education) and who received nutrition services were generally small, the differences between the Project and control areas were pronounced. However, in all areas, improvement over the baseline period was substantial in the follow-up period. The proportions of sample children who had a nutrition contact, well child contact or "other" contact increased 48.6% in $E_1$ to 52% of all children. There was an increase of 36% in $E_2$ to 41.8% of all children. Nutrition services in the project areas were, for the most part, Child Nutrition Center (CNC) services; the increase in use of such services reflects the special emphasis given to CNC's in the Project districts.

A breakdown of where children received health services is provided in Table 17. In both project implementation areas and control areas, clearly the major source of health care for preschool children has been the subdistrict health center. Although this generally remained true in both baseline and follow-up surveys, there were some distinctive and divergent changes in the distribution of services by source between the Project and control areas.

In Project intervention areas, there was a moderate increase in utilization of the subdistrict health centers and district hospitals. In Project intervention areas, the subdistrict health center had been used by 77% of the children who were served in the follow-up period. There was a general increase in village-based services: 5% of all children who had received services had received them from health post volunteers and use of Child Nutrition Centers increased in both $E_1$ and $E_2$. Along with the increased utilization of rural health services of both the government health facilities and village-based providers in the Project areas, there was a concurrent drop in utilization of the Provincial Hospital. Use of the Provincial Hospital declined substantially in both Project areas -- a 13% drop in $E_1$, and a 4% drop in $E_2$ -- as rural health facilities were strengthened and the primary health care network was established through Project efforts.

The distribution of services received by target age children in the control areas revealed a somewhat different pattern. In both control areas, there was a major drop in the proportions of children receiving services in rural health facilities, primarily the subdistrict health centers. In the baseline survey, utilization of subdistrict health centers had been at similar or higher levels than in the Project area. In the follow-up period the proportion of services provide to children by these centers had dropped 29% in the $C_1$ area, and 15% in $C_2$. The second major source of services to children in the control areas has been the

## Table 17

Source of Services for Children Under Age Six
Who Received Government-Supported Services
in the Previous Year in Project Areas (Baseline and Follow-up)

| | Source of Service | % of Children Receiving Services[a] | | |
|---|---|---|---|---|
| | | Baseline % | Follow-up % | % Increase/ Decrease |
| $E_1$ | Health Post Volunteer[b] | 0.3% | 5.3% | +5.0% |
| | Child Nutrition Center | 2.2% | 8.9% | +6.7% |
| | Subdistrict Health Center | 72.8% | 77.2% | +4.4% |
| | District Hospital[c] | 1.2% | 12.9% | +11.7% |
| | Provincial Hospital | 29.3% | 16.1% | -13.2% |
| | Mobile Unit/Other | 3.1% | 2.7% | -0.4% |
| | N-BL = 324, N-FU = 224 | | | |
| $E_2$ | Health Post Volunteer | 0.1% | 5.3% | +5.2% |
| | Child Nutrition Center | 0.9% | 3.9% | +3.0% |
| | Subdistrict Health Center | 66.8% | 77.3% | +10.5% |
| | District Hospital | 3.3% | 4.8% | +1.5% |
| | Provincial Hospital | 21.6% | 17.6% | -4.0% |
| | Mobile Unit/Other | 7.3% | 4.2% | -3.1% |
| | N-BL = 693, N-FU = 357 | | | |
| $C_1$ | Health Post Volunteer | 0.0% | 0.0% | -0 |
| | Child Nutrition Center | 0.3% | 2.1% | +1.8% |
| | Subdistrict Health Center | 74.2% | 45.7% | -28.5% |
| | District Hospital[d] | 2.4% | 1.1% | -1.3% |
| | Provincial Hospital | 22.4% | 43.6% | +21.2% |
| | Mobile Unit/Other | 3.0% | 3.2% | +0.2% |
| | N-BL = 330, N-FU = 94 | | | |
| $C_2$ | Health Post Volunteer | 0.0% | 0.0% | -0 |
| | Child Nutrition Center | 0.0% | 0.0% | -0 |
| | Subdistrict Health Center | 91.8% | 76.7% | -15.1% |
| | District Hospital[d] | 2.2% | 0.0% | -2.2% |
| | Provincial Hospital | 11.2% | 20.9% | +9.7% |
| | Mobile Unit/Other | 0.0% | 9.3% | +9.3% |
| | N-BL = 134, N-FU = 43 | | | |

[a] Sum of % may exceed 100% as more than one source of service was used by some persons.

[b] A few volunteers had been trained before baseline data collection began.

[c] There was a medical and health center (but no district hospital) in $E_1$ during the baseline survey, but a district hospital was built before the follow-up survey.

[d] There is no district hospital in these districts.

Source: Community Health Survey

Provincial Hospital (Lampang Provincial Hospital for the $C_1$ area, Lampoon Provincial Hospital for the $C_2$ area). In both control areas, there was an increase in the use of hospital services by children: an increase of 25% in $C_1$, and 10% in $C_2$. The lack of village-based health care alternatives is also apparent in the control districts. There were no health post volunteers in the $C_1$ district, and few child nutrition centers. In the $C_2$ district, although there were MOPH-trained health volunteers in some villages, they were not used by children sampled. No children in $C_2$ received services from child nutrition centers.

In su-mary, there are several general observations concerning utilization of services by children under age six during Project implementation:

(1) By the end of Project operations, a much larger proportion of the target group children in project areas had been reached with government-supported services than in the control areas.

(2) There were moderate increases in coverage of children with medical care services in both Project and control areas, but Project areas demonstrated broader coverage of children with nutrition services, well child services and other health promotion and disease prevention services.

(3) In Project areas, there was a definite shift in child service utilization to the rural health facilities and village-based providers, with a concurrent reduction in Provincial Hospital use. Trends in the control areas were generally in the opposite direction.

## UTILIZATION OF HEALTH SERVICES BY TARGET GROUP WOMEN

The Community Health Survey measured overall utilization of government health services by women of reproductive age. The survey provided data concerning overall service coverage of the whole target group, as well as coverage by specific types of services.

### General Health Service Utilization

Table 18 summarizes overall coverage of target group women who utilized health services in the year previous to the survey interviews. The follow-up data indicate that service utilization by women in the year previous to survey interviews had reached between 40% and 45% in all areas; $E_1$ and $E_2$ showed slightly higher proportions of women using services than control areas.

Table 18

Proportion of All Women Age 15-44 Years Who Utilized Any Government Health Service During the Previous Year (Baseline and Follow-up)

| Area (year of survey) | Baseline: Total No. of women surveyed | Baseline: No. of women receiving health services | Baseline: % | Area (year of survey) | Follow-up: Total No. of women surveyed | Follow-up: No. of women receiving health services | Follow-up: % | % Increase/ Decrease |
|---|---|---|---|---|---|---|---|---|
| $E_1$ (1975) | 1,915 | 693 | 36.2% | $E_1$ (1979) | 953 | 426 | 44.7% | +8.5% |
| $E_2$ (1977) | 3,083 | 928 | 30.1% | $E_2$ (1979) | 1,534 | 690 | 45.0% | +14.9% |
| $C_1$ (1975) | 1,370 | 557 | 40.7% | $C_1$ (1979) | 657 | 281 | 42.8% | +2.1% |
| $C_2$ (1975) | 665 | 200 | 30.1% | $C_2$ (1979) | 303 | 132 | 43.6% | +13.5% |

Source: Community Health Surveys

Measurement of service coverage for all women age 15-44 has been a major objective of Project evaluation, as this utilization relates directly to assessing achievement of the Project objectives. But utilization rates for all women are gross measures that do not provide sufficient detail concerning coverage of groups within this population who have specific health needs or are at high risk. Most data available indicate that service utilization is concentrated among currently married women who are pregnant or have delivered a child or are practicing family planning. Such needs are specific, and coverage is best measured in terms of these subgroups with clear and specific needs for health services.

## Utilization of Maternity Services

The group within the population of reproductive-age women who have the most important health needs are those currently married. This group is comprised of about 50% to 60% of all women age 15 to 44. However, only a small proportion of women currently married would be in need of maternity services in any given period. The target group relevant to assessing utilization of maternity services are women who have had a delivery. To gain a sufficient sample of women in need of maternity care, married women interviewed during the Community Health Surveys were asked about services received for deliveries which occurred in the two years provious to the interview date. Maternity services include prenatal care, postnatal care and delivery care. Table 19 summarizes the relevant target group numbers. The proportion of married women who had delivered a child in the previous two years was near 25% in all baseline areas; all areas showed a decrease of 5% to 9% to levels of between 16% and 20% in the follow-up period.

## Table 19

Sample Population with Need for Maternity Services (Baseline and Follow-up)

| Sample Women | No. Women in Each Group | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
| | BL | FU | BL | FU | BL | FU | BL | FU |
| No. women age 15-44 | 1,915 | 953 | 3,083 | 1,534 | 1,370 | 657 | 665 | 303 |
| No. currently married | 1,150 | 514 | 1,904 | 871 | 907 | 419 | 391 | 142 |
| No. who delivered in previous two years | 282 | 101 | 474 | 143 | 235 | 73 | 97 | 24 |
| % Married women who delivered | 24.5 | 19.6 | 24.9 | 16.4 | 25.9 | 17.4 | 24.8 | 16.9 |
| Decrease in need for maternity services | -4.4% | | -8.5% | | -8.5% | | -7.9% | |

For women who delivered in both Project implementation areas and control areas, there was a substantial increase in the proportion who were served by a trained attendant. (Trained attendants are those who provide delivery services under the provincial health service system: doctors, nurses, government midwives, wechakorn, and traditional birth attendants (TBA) trained under the Lampang Project.) Table 20 shows the levels of government-supported delivery care.

## Table 20

Proportion of Women Who Gave Birth to a Child in the Two Years Previous to Interview Who Received Delivery Care by Trained Attendants of the Government-Supported Delivery System (Baseline and Follow-up)

| Area (year of survey) | Baseline | | | Area (year of survey) | Follow-up | | | % Increase/ Decrease |
|---|---|---|---|---|---|---|---|---|
| | No. of deli-veries | No. of deliveries by trained attendants | % | | No. of deli-veries | No. of deliveries by trained attendants | % | |
| $E_1$ (1975) | 282 | 124 | 44.0 | $E_1$ (1979) | 101 | 89 | 88.1 | +44.1% |
| $E_2$ (1977) | 474 | 198 | 41.8 | $E_2$ (1979) | 143 | 112 | 78.3 | +36.5% |
| $C_1$ (1975) | 235 | 75 | 31.9 | $C_1$ (1979) | 73 | 31 | 42.5 | +10.6% |
| $C_2$ (1975) | 97 | 30 | 30.9 | $C_2$ (1979) | 24 | 11 | 45.8 | +14.9% |

Note: Trained attendants are government physicians, nurse, midwifes, and wechakorn along with indigenous midwives trained by the Lampang Project. Indigenous midwives were not trained by the Project until after the baseline surveys, so their services are not included in baseline coverage levels.

Table 21 summarizes the places of delivery and the sources of delivery care received. While coverage of women in need of delivery care increased in both Project and control areas, the absolute levels of delivery services received -- as well as the respective increases from the baseline periods -- were considerably higher in the Project areas. Coverage of deliveries in the combined Project areas rose 39.8% from a baseline average of 42.6% to an average of 82.4% in the follow-up period. In contrast, the combined control areas increased less than 12% from a 31.6% average in the baseline period to a 43.3% average in the follow-up survey.

Table 21

Proportion of Women Who Received Delivery Care Services in Previous Two Years, by Place and Provider of Care (Baseline and Follow-up)

| Place and Provider of Care | % of Women who delivered | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | | $E_2$ | | | $C_1 + C_2$ [a] | | |
| | BL | FU | % Increase/ Decrease | BL | FU | % Increase/ Decrease | BL | FU | % Increase/ Decrease |
| Place of delivery: | | | | | | | | | |
| Home | 63.8 | 43.6 | -20.2% | 58.9 | 49.7 | -9.2% | 72.6 | 49.5 | -23.1% |
| Rural Health Facility [b] | 1.1 | 22.8 | +21.7% | 1.9 | 3.5 | +1.6% | 0.6 | 2.1 | +1.5% |
| Hospital [c] | 33.0 | 32.7 | -0.3% | 37.5 | 44.8 | +7.3% | 26.5 | 43.3 | +16.8% |
| Other | 2.1 | 1.0 | -1.1% | 1.7 | 2.1 | +0.4% | 0.3 | 5.2 | +4.9% |
| Attendant: | | | | | | | | | |
| Physician | 9.6 | 4.9 | -4.7% | 7.0 | 12.6 | +5.6% | 4.2 | 5.2 | +1.0% |
| Nurse | 19.5 | 18.8 | -0.7% | 17.5 | 18.2 | +0.7% | 19.9 | 27.8 | +7.9% |
| Government Midwife [d] | 14.9 | 30.7 | +15.8% | 17.3 | 17.5 | +0.2% | 7.5 | 10.3 | +2.8% |
| Traditional Birth Attendant | 39.4 | 33.7 | -5.7% | 42.8 | 30.1 | -12.7% | 47.9 | 10.3 | f |
| Other/Unknown [e] | 16.7 | 11.9 | -4.8% | 15.4 | 21.7 | +6.3% | 20.5 | 46.4 | f |

[a] These areas have been combined because sample numbers were very small in follow-up rounds.

[b] Includes district hospitals, subdistrict health centers, and midwifery centers.

[c] Mostly Provincial Hospital, but about 5% of hospital deliveries were at private hospitals.

[d] Government midwives or nurses could also be wechakorn.

[e] Other includes self delivery, relatives, friends.

[f] Incorrect completion of survey interview forms mixed these categories in the control areas.

About half of all women, as Table 21 indicates, give birth to their children at home, although the proportion who do so declined by 9% to 20% in the follow-up period. Use of rural health centers increased sharply to 23% in the $E_1$ area. In other areas the proportion of women using rural health facilities was under 5%. Use of hospitals (primarily the Provincial Hospital) decreased in $E_1$, but increased moderately in the $E_2$ area and sharply in the control areas. In the areas where women have increasingly utilized the Provincial Hospital for delivery care ($E_2$ and combined control areas), the use of doctors and nurses, most of whom are in the provincial hospitals, has also increased. In the $E_1$ areas, where use of rural health facilities increased, the government midwives delivered over 30% of all newborns, up 16% from the baseline. Government midwives attended over 30% of deliveries in $E_1$ and over 17% in $E_2$ districts for the follow-up period. In the combined control areas, government midwives attended 10.3% of deliveries.

Despite a decline of 6% to 13% in the proportion of women using TBA services between the baseline and follow-up periods, the traditional birth attendant still delivers about one-third of all children born in the rural areas surveyed.

In general, use of conventional government delivery attendants -- doctors, nurses, midwives -- reached higher levels in the Project areas than in the control areas at the time of follow-up data collection; there were also considerable increases in the use of conventional government delivery services in both Projects and control areas between baseline and follow-up periods. However, the greatest contribution to the high rates of delivery service coverage apparent in Project areas during the follow-up period were made by trained traditional birth attendants. Delivery care coverage in Project areas increased by over 40% between the baseline and follow-up periods, and about 30% of that increase was a result of including trained TBA services.

Utilization of prenatal care services at least once during pregnancy by women who had delivered during the two years previous to the time they were interviewed improved substantially in both Project and control areas. At the time of the follow-up surveys, the proportion of women who said they had received prenatal care for their most recent pregnancy had reached 68% for the combined Project intervention areas and 72% in the combined control areas. These levels represented a 24% increase over baseline levels in Project areas, and a 32% increase in the control a Table 22 provides a more detailed review of prenatal care utilization.

## Table 22

**Utilization of Prenatal Care Services by Women Who Delivered a Child in the Previous Two Years (Baseline and Follow-up)**

### Part A. General Coverage

| Area (year of survey) | Baseline: No. women who had a delivery | Baseline: No. women who received prenatal care | Baseline: % Who received prenatal care | Follow-up: Area (year of survey) | Follow-up: No. women who had a delivery | Follow-up: No. women who received prenatal care | Follow-up: % Who received prenatal care | % Increase/ Decrease |
|---|---|---|---|---|---|---|---|---|
| $E_1$ (1975) | 282 | 157 | 55.7% | $E_1$ (1979) | 101 | 71 | 70.3% | +14.6% |
| $E_2$ (1977) | 474 | 246 | 51.9% | $E_2$ (1979) | 143 | 95 | 66.4% | +14.5% |
| $C_1$ (1975) | 235 | 125 | 53.2% | $C_1$ (1979) | 73 | 55 | 75.3% | +22.1% |
| $C_2$ (1975) | 97 | 39 | 40.2% | $C_2$ (1979) | 24 | 15 | 62.5% | +22.3% |

### Part B. Source of Prenatal Care Received

| Source of Prenatal Care | % of Women who delivered | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | | $E_2$ | | | $C_1+C_2$ [a] | | |
| | BL | FU | % Increase/ Decrease | BL | FU | % Increase/ Decrease | BL | FU | % Increase/ Decrease |
| Received government-supported care [b] | 95.5 | 92.9 | -2.6% | 97.2 | 95.8 | -1.4% | 98.2 | 94.2 | -4.0% |
| Provincial Hospital | 60.5 | 43.7 | -17.8% | 79.3 | 71.6 | -7.7% | 78.7 | 75.7 | -3.0% |
| Rural Health Facilities [c] | 35.0 | 49.3 | +14.3% | 17.9 | 24.4 | +6.3% | 19.5 | 17.1 | -2.4% |
| Private MD Clinic | 0.6 | 2.8 | +1.2% | 1.2 | 2.1 | +0.9% | 0.0 | 0.0 | -0 |
| TBA | 1.9 | 0.0 | -1.9% | 0.4 | 0.0 | -0.4% | 0.6 | 1.4 | +0.8% |
| Other | 1.9 | 4.2 | +2.3% | 1.2 | 2.1 | +0.9% | 1.2 | 5.7 | +4.5% |
| Total | 99.9[d] | 100.0 | | 100.0 | 100.0 | | 100.0 | 99.9[d] | |

[a] $C_1$ and $C_2$ data combined because of small numbers in follow-up samples.

[b] Provincial Hospital, district hospital, subdistrict health centers, midwifery centers (and project-trained TBA's in the follow-up surveys).

[c] Includes district hospitals, subdistrict health centers, and midwifery centers.

[d] Less than 100.0% due to rounding.

The source of care received, shown in Part B, is of particular interest. First, the table shows that government-supported sources are the major providers of prenatal care; although there was a small decline from baseline levels, over 90% of prenatal services had been provided by government sources in the follow-up period. Moreover, the major sources of prenatal care were the conventional government facilities: the Provincial Hospital, district hospitals, and rural health centers. In contrast to the pattern of delivery service use, few women reported seeking prenatal care from traditional birth attendants. This is surprising, as TBA's accounted for 30% to 35% of all deliveries.

Prenatal care utilization had reached high, roughly comparable levels in both project and control areas by the follow-up period. There were, however, differences in the pattern of service use between project and control areas. In both Project areas, there was a moderate decline in use of the Provincial Hospital for prenatal care, and a 6.3% to 14.8% increase in use of rural health facilities. The control areas showed a slight decrease in hospital use, as well as a 2.4% decrease in utilization of prenatal services at rural health facilities. There was, however, an increase in the use of TBA's and other types of providers, a trend not apparent in Project areas where TBA's had been trained.

Use of postnatal services (in the six weeks after delivery) by women who had delivered in the previous two years contrasted strikingly with utilization of prenatal and delivery care. Unlike other maternity services, postnatal care was received by only a small proportion of women who had delivered a child. Table 23 shows the utilization levels of postnatal care in the baseline and follow-up periods.

Table 23

Utilization of Postnatal Care Services by Sample Women Who Delivered a Child in the Previous Two Years (Baseline and Follow-up)

| Area (year of survey | Baseline | | | Area (year of survey) | Follow-up | | | Increase/ Decrease |
|---|---|---|---|---|---|---|---|---|
| | No. women who delivered | No. women who had postnatal care | % who had postnatal care | | No. women who delivered | No. women who had postnatal care | % who had postnatal care | |
| $E_1$ (1975) | 282 | 27 | 9.6 | $E_1$ (1979) | 101 | 18 | 17.8 | +8.3% |
| $E_2$ (1977) | 474 | 55 | 11.6 | $E_2$ (1979) | 143 | 22 | 15.4 | +3.8% |
| $C_1$ (1975) | 235 | 27 | 11.5 | $C_1$ (1979) | 73 | 10 | 13.7 | +2.2% |
| $C_2$ (1975) | 97 | 11 | 11.3 | $C_2$ (1979) | 24 | 3 | 12.5 | +1.2% |

In the baseline period, the levels of utilization were comparable in both project intervention and control areas: 10.8% of women who had delivered a child had received postnatal care services at least once in the combined $E_1$ and $E_2$ areas; 11.4% of women in the combined control areas had received such services. Substantial change occurred in the follow-up period, with rates of utilization increasing in all areas. However, use of postnatal services in the combined project areas rose to 16.5% (an increase of 6.0%) whereas control area utilization reached 13.1% (an increase of 1.7%). Despite the general increase in use of postnatal care service between baseline and follow-up periods, only a relatively few women made use of such services after delivering their children. The reason for this appears to be quite pragmatic: once the children have been born, women see no need for postnatal care for themselves or their children unless problems develop. When asked why they did not seek postnatal care, 70% to 80% responded that they had experienced no problem and saw no necessity for using this type of service. The two most frequently cited reasons for using postnatal services were that some problem or complication had developed, or that the person who delivered the baby (generally a government health worker) had made an appointment with the mother for a postnatal examination.

It appears, however, that having delivered healthy babies, and feeling well themselves, women generally see little need to seek postnatal care. Only a small proportion of women receive postnatal visits in their homes by the people who delivered their children; although there has clearly been major improvement in the project areas, there has perhaps been a less systematic effort to reach mothers in the immediate post-delivery period.

Family Planning Practice

Since the Thai government formally approved a National Family Planning Project in 1970, most contraceptive methods, including the oral pill, intrauterine devices (IUD), DepoProvera injections and both male and female sterilization have been made widely available in rural areas, mostly through the MOPH network of rural health facilities and special mobile campaigns. High levels of current contraceptive practice had been reached nationwide by the mid-1970's, with the northern and central regions showing the highest usage rates. The Survey of Fertility in Thailand found 43% of married women in the North and 42% of those in the Central Region currently practicing contraception in 1975 (SOFT, 1975). Baseline survey data also indicated high rates of contraception in both project and control areas of Lampang, and for the control area in adjacent Lampoon Province. As about 50% of currently married women age 15-44 were practicing contraception in the baseline periods, Project staff

did not expect much change in follow-up levels. However, a general increase in contraceptive practice did occur, as summarized in Table 24. The levels of current practice in the $E_1$ and $C_1$ areas reached approximately the same levels by the follow-up period; the $E_2$ level was about 10% lower (although there were only two years between baseline and follow-up) and the $C_1$ level was about 10% higher. The proportionate increases in the two control areas were, however, substantially higher than in the project areas. Table 25 shows the change in the types of contraceptives used by women. The table includes those women whose husbands have had a vasectomy, which has become an increasingly important contraceptive method during the years of Lampang Project operations. The oral pill continued to be the major contraceptive used in areas surveyed: about 30% to 47% of all women using contraceptives use the pill, and levels of pill use increased substantially in all areas except $E_2$ districts. DepoProvera use increased in all areas although, with one exception, no more than about 5% of women use this method. (In the $C_2$ control district in adjacent Lampoon Province, a large proportion of women practicing contraception use DepoProvera. A large DepoProvera trial program began in 1965 when the mission-supported McCormick Hospital in Chiengmai introduced the injectible contraceptive, and began serving large numbers of women in Chiengmai and Lampoon Province. These program services are thus reflected in the $C_2$ data.) Except in the $C_1$ district, where little change occurred, use of the IUD is declining. Sterilization has become an increasingly

Table 24

Proportion of Currently Married Women Age 15-44 Practicing Contraception at the Time of Interview (Baseline and Follow-up)

| Age Group | % of Women practicing contraception | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ BL n=1,058 (1975) | $E_1$ FU n=466 (1979) | $E_2$ BL n=1,783 (1977) | $E_2$ FU n=811 (1979) | $C_1$ BL n=838 (1975) | $C_1$ FU n=379 (1979) | $C_2$ BL n=371 (1975) | $C_2$ FU n=127 (1979) |
| All ages | 56.1 | 64.4 | 50.8 | 53.8 | 50.7 | 62.5 | 58.0 | 73.2 |
| 15-19 | 22.4 | 46.7 | 21.8 | 19.5 | 13.8 | 23.1 | 25.0 | 50.0 |
| 20-24 | 47.5 | 61.1 | 43.7 | 53.6 | 46.0 | 51.0 | 49.4 | 70.6 |
| 25-29 | 74.1 | 64.8 | 59.0 | 61.5 | 68.2 | 68.2 | 75.3 | 82.1 |
| 30-34 | 73.1 | 72.4 | 63.3 | 53.0 | 61.0 | 71.4 | 68.0 | 89.3 |
| 35-39 | 58.4 | 76.0 | 57.1 | 61.3 | 56.8 | 75.3 | 68.1 | 84.6 |
| 40-44 | 45.4 | 57.8 | 39.2 | 47.4 | 39.4 | 54.0 | 41.5 | 54.8 |
| % change BL to FU | +8.3% | | +3.0% | | +11.8% | | +15.2% | |

Table 25

Proportion of Currently Married Couples (With Wife Age 25-44 Years) Practicing Contraception at the Time of Interview, by Type of Contraceptive Used (Baseline and Follow-up)

| Contraceptive Type | Percent of Currently Married Women Using FP Services | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
| | BL | FU | BL | FU | BL | FU | BL | FU |
| Oral pill | 35.8 | 42.7 | 28.2 | 29.0 | 33.3 | 39.8 | 28.8 | 46.5 |
| DepoProvera Injection | 1.6 | 5.2 | 3.0 | 3.1 | 0.4 | 1.8 | 21.6 | 17.3 |
| IUD | 8.6 | 6.0 | 8.9 | 7.8 | 11.5 | 11.6 | 4.0 | 2.4 |
| Male Sterilization | 0.0 | 5.8 | 2.1 | 4.4 | 0.0 | 2.4 | 0.0 | 0.8 |
| Female Sterilization | 8.3 | 10.1 | 8.9 | 8.8 | 4.5 | 9.2 | 3.0 | 7.1 |
| Other | 1.8 | 0.9 | 3.3 | 2.6 | 1.1 | 0.3 | 2.4 | 1.6 |
| Total Using All Types[a] | 56.0 | 70.6 | 53.7 | 55.8 | 50.7 | 65.2 | 59.8 | 75.6 |
| % Increase/Decrease | 14.6% | | 2.1% | | 14.5% | | 15.8% | |

[a]Some percentages are higher than in Table 24 because women whose husbands are sterilized are also included here, but not in Table 24.

important contraceptive method during the period of project operations. Female sterilization increased in all areas except $E_2$, and male sterilization rose substantially in the project areas. In the follow-up period, the proportion of contracepting women who had been sterilized or whose husbands had a vasectomy were: 15.9% in $E_1$; 13.2% in $E_2$; 11.6% in $C_1$; and 7.9% in $C_2$.

Project activities do not appear to have had any distinguishable effect on levels of contraceptive practice. The government National Family Planning Program was well-organized and operating effectively in both Project and control areas before Project activity began. The set of social and economic factors operating had motivated very large numbers of rural women to accept the services available. However, building on the family planning service system already in place, the Project sought to bring several types of contraceptive services closer to the users: a mobile vasectomy team was organized in the Provincial Hospital's community health department; Project-trained wechakorn in rural health centers were authorized to insert IUD's and inject DepoProvera (activities previously confined to district and provincial hospitals); health post volunteers were given oral contraceptives for distribution in their villages (after the initial prescription was made at government health facility); and all village volunteer groups participated in motivating new acceptors.

The Community Health Survey data showed that the government remains the major provider of contraceptive services. In the Lampang districts (including the control), about 90% of all contraceptive services were received from government sources. The $C_2$ district of Lampoon was somewhat different. Because of the large number of women who receive contraceptive services through the mission-hospital DepoProvera program, the proportion of women served by government services was less. Table 26 shows the sources from which women received their contraceptive services.

Table 26

Proportion of Currently Married Women Who Practice Contraception[a] by Source of Contraceptive Service (Baseline and Follow-up)

| Source of Contraceptive Service | % of Contracepting married women | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
| | BL[b] | FU | BL | FU | BL | FU | BL | FU |
| Government-supported sources: [c] | 94.6 | 92.7 | 83.4 | 82.2 | 95.2 | 94.9 | 61.9 | 65.6 |
| Hospitals | 30.3 | 19.4 | 36.6 | 31.4 | 31.7 | 33.3 | 18.1 | 8.6 |
| Rural facilities [d] | 64.3 | 50.6 | 44.3 | 39.8 | 63.5 | 61.6 | 43.8 | 51.6 |
| Health Post Volunteer | 0.0 | 20.6 | 0.4 | 11.0 | 0.0 | 0.0 | 0.0 | 5.4 |
| Private hospital/ clinic | 1.4 | 4.8 | 3.8 | 4.4 | 0.0 | 1.7 | 24.2 | 22.6 |
| Drug store | 2.9 | 3.3 | 13.5 | 8.9 | 3.4 | 1.7 | 5.6 | 5.4 |
| Other | 1.1 | 1.2 | 1.3 | 4.4 | 1.4 | 1.7 | 8.4 | 6.4 |
| Total | 100.0 | 99.9[e] | 99.9[e] | 99.9[e] | 100.0 | 100.0 | 100.0 | 100.0 |
| %Increase/Decrease | -1.9% | | -1.2% | | -0.3% | | +3.7% | |

[a] Including women whose husbands are sterilized.
[b] Baseline data incomplete in $E_1$; estimated from data available.
[c] Includes all government facilities/providers plus HPV's and tambon doctors.
[d] Includes district hospitals, subdistrict health centers, and midwifery centers.
[e] Totals less than 100% due to rounding.

The Provincial Hospital and rural health facilities (district hospitals and rural health centers) are the main sources of government services. The proportion of women using these facilities for contraceptive services declined quite substantially in both $E_1$ and $E_2$ during the follow-up period, and remained the same in the $C_1$ and the $C_2$ areas. In the $E_1$ and $E_2$ areas, a large proportion of contraceptive users received services from health post volunteers, who distribute follow-up

cycle pills. Rural health facility distribution of oral contraceptives has increasingly shifted to the village-based health post volunteers. In the $C_2$ area, where the Ministry of Public Health trained village health volunteers beginning in 1977, over 5% of women practicing contraception received their pills from the volunteers.

Vasectomy may be done in any facility where a physician is present, but on an outpatient basis. Most have been done in the provincial and district hospitals. With the organization of the mobile vasectomy clinic by Project and Provincial Hospital staff, rural men increasingly received their vasectomies through the mobile team close to their homes. An MOPH program subsidizing private physicians to provide vasectomies also brought an increasing proportion of men to private clinics in the follow-up period. There was a general decline in the proportion of vasectomies provided at the district hospital.

DepoProvera injections have normally been available only at government hospitals, and at private hospitals and MD clinics. In the follow-up period, however, Project-trained wechakorn in rural health centers provided an increasing proportion of services to women using DepoProvera; over two-thirds of all DepoProvera users received their services from rural health facilities in the $E_1$ and $E_2$ areas. This proportion was slightly over 40% in the $C_1$ control district. In the $C_2$ control area, over 90% of women continued to get their injections through the mission-hospital DepoProvera program.

The clearest Project contribution to the pattern of contraceptive service utilization is oral contraceptive distribution by health post volunteers. The great majority of pills have, in recent years, normally been distributed through rural health facilities (less than 10% of women using the pill get them from drug stores). In Project districts, the village-based health post volunteers had achieved an important role in pill distribution in the follow-up period. Thirty-four percent of all pill users in the $E_1$ area and 20.6% of those in the $E_2$ area were getting their pills from volunteers in 1979. In the $C_2$ control area, volunteers trained under the Ministry of Public Health's National Primary Health Care Program also distributed oral contraceptives to 8.5% of women using the pill. No volunteers had been trained in the $C_1$ control district at the time of the follow-up surveys.

In project areas, women have increasingly turned to health post volunteers for their monthly pill supply as volunteers are easily accessible, are available in non-official hours, and provide the pills for only a small donation. Turning over a part of pill distribution to village health volunteers has relieved health center

workers of many routine tasks; it has brought pill distribution closer to the user's home; it has incorporated the use of low-cost providers (the HPV's); and it has established a mutually beneficial working link between the government health workers and the village volunteers.

To summarize the review of service utilization by women of child-bearing age, and particularly the groups within that population who have specific health needs, several conclusions can be made:

- There was a substantial increases in utilization of government-supported health services by women of reproductive age in both Project and control areas, although the absolute levels in project areas were slightly higher. However, in no area did the proportion of all women served reach two-thirds, as the original project objectives specified.
- Over 80% of women who had a child in the previous two years were attended by a government-supported attendant in Project areas; this was an extremely large increase over baseline levels, and was substantially higher than levels in the control areas. Most of the increase in delivery service utilization in project areas was a result of services provided by project-trained traditional birth attendants, although use of other providers also increased.
- In all areas, there was a definite trend away from delivering at home, and from using traditional birth attendants; nevertheless, the majority of women in all areas continue to have their children at home attended by a traditional midwife. There was also increasing use of the Provincial Hospital for delivery care.
- Prenatal care was received by 66% to 70% of women in the Project areas and by 63% to 75% of women in the control areas. Rural health facilities were used for prenatal care more frequently in the project areas than in control areas; interestingly, traditional birth attendants rarely provided prenatal care.
- Few women sought postnatal care, although Project areas demonstrated sharp improvement between the baseline and follow-up period. Postnatal care appears to be sought only by women who have some complication following childbirth, and less frequently by those who have made arrangements previously with the delivery attendant.

- A large proportion - at least two-thirds - of women in both Project and control areas who deliver continued to undergo the traditional post-natal "roasting" (lying by the fire) for periods of up to one month.
- Contraceptive use, already at high levels during the baseline period, rose to new levels in both Project and control areas during the baseline period. The highest levels were reached in the $E_1$ and $C_2$ areas.
- The oral pill remained the major contraceptive method used, and the proportion of women using the pill increased in all areas. Sterilization has become an increasingly important contraceptive method; however, in Project areas, male sterilization increased more than in the control areas, in part due to the mobile vasectomy activities. For female sterilization, the trend was reversed; increases in the control areas were greater than in Project areas. IUD use declined in all areas. DepoProvera use increased moderately.
- The Project effort to bring family planning services closer to the women using them has been generally successful; wechakorn have increasingly assumed more responsibility for DepoProvera injections in rural health centers, and to a lesser extent for IUD insertions. Health post volunteers secured a major role in sharing pill distribution with rural health facilities: 20% to 30% of pill users received their monthly supply from volunteers in project areas; 8.5% of women using the pill in the $C_2$ district also got their pills from MOPH-trained volunteers.

## UTILIZATION OF ILLNESS CARE SERVICES BY THE RURAL POPULATION

Measuring use of medical care services by the Lampang population was not a major priority in evaluating coverage of the target populations. However, as earlier sections have indicated, medical care is one of the health services most frequently used by all groups and may therefore be used as one general indicator of the population's contact with the health care delivery system.

Data for assessing the level of illness in the population and the type of care sought by those who were ill were provided by the Project Community Health Survey.

Each family interviewed was asked if any members had been ill within the previous two weeks. Then a history for each illness episode was completed, including duration, symptoms, and characteristics of the ill person. Finally, a record of the first and any subsequent sources of medical care utilized for each illness episode was made. These included both government and private sector providers.

## Illness Episodes

Illness episodes experienced by the sample population were reported for the two weeks previous to the interview date. There are several limitations in this type of morbidity survey. The single household member normally interviewed must report illness for herself (or himself) as well as for all other family members; recall is therefore a problem. No physical examination or medical confirmation of illness was made; thus the survey was actually a survey of illness symptoms.

Table 27 summarizes the illness rates of the sample populations.

Table 27

Illness Episodes per 1,000 Population Reported in the Two Weeks Previous to Interviews, by Age Group (Baseline and Follow-up)

| Age/Economic Groups | Illness Rates/100 Population | | | | | |
|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1 + C_2$[a] | |
| | BL | FU | BL | FU | BL | FU |
| All Ages | 8.0 | 6.5 | 6.9 | 10.0 | 9.0 | 7.5 |
| Women Age 15-44 | 7.2 | 5.1 | 5.7 | 8.0 | 7.6 | 8.6 |
| Children Under Age 6 | 15.4 | 14.9 | 15.3 | 16.4 | 13.2 | 20.6 |
| Poor | 7.5 | 7.1 | 7.9 | 11.2 | 8.5 | 11.6 |
| Middle Levels | 8.0 | 6.4 | 6.6 | 9.6 | 7.2 | 7.9 |
| Prosperous | 10.5 | 5.0 | 7.8 | 9.0 | 7.4 | 7.6 |

[a] Control areas combined because of small sample numbers.

Illness rates declined for all age groups in the $E_1$ area between the baseline and follow-up periods, but increased for all age groups in the $E_2$ and combined control districts. Rates for preschool children were uniformly higher than any other group in the population; illness rates for women of reproductive age were slightly lower than for the population as a whole. The poor experienced the highest illness rates in all areas for the follow-up period, although this pattern was not so uniformly apparent in the baseline data.

It was also observed that small households in all areas had the highest illness rates, and that large households had the lowest rates. This pattern held three for both baseline and follow-up rounds. Two factors may contribute to these differential rates: the household member interviewed may have been more aware of and could more easily recall illness episodes for a small number of family members than for a large number; and the poor, who tend to have higher illness rates, are concentrated in small households.

## Utilization of Services for Illness by Rural Villagers

Table 28

Proportion of Estimated Illness Episodes Covered by Government-Provided Illness Care Services in Project Areas (Baseline and Follow-up)

| | Area | % Population Using Service | | % Increase/Decrease |
|---|---|---|---|---|
| | | Baseline | Follow-up | |
| General population illness care service provided by government health service for estimated episodes in past year | $E_1$ | 26.2% | 55.8% | + 29.6% |
| | $E_2$ | 18.1% | 34.0% | + 15.9% |
| | $E_1+E_2$ | 19.0% | 36.5% | + 17.5% |
| | $C_1$ | 12.6% | 21.1 | + 8.5% |

The majority of illness and injury experienced by the rural population is generally of a minor nature and often self-limited. A large proportion of illness episodes experienced may only require symptomatic treatment by the ill person himself, or by a provider who need not be highly trained. It is therefore not surprising that national surveys, as well as the Lampang Project surveys, have shown that about half of all ill people simply buy medicine at a drug store (where they also get some diagnostic and therapeutic advice). Many people with minor illness may choose other local village providers, such as herbalists and injection "doctors". Many also come to government health facilities, particularly the Provincial Hospital. A review of outpatient records in the Lampang Provincial Hospital in 1975 suggested that over 50% of all outpatients had a minor ailment which did not require the attention of a hospital practitioner.

The surveys indicating that only about 20% of ill people choose a government source for care has troubled MOPH leaders for some time. On the other hand, the often-mentioned "overutilization" of provincial hospitals by patients with minor illnesses has, similarly, been an area of concern. Ministry of Public Health policies that have evolved, and which were also reflected in Lampang Project planning, have therefore aimed at expanding the provincial health care delivery system's capability and credibility in caring for the ill close to their homes with services appropriate to the severity of the illness. This is one important background aspect which led to the training of wechakorn paraphysicians and the development of the village-based primary health care network of the Lampang Project. It was not the Project's objective to eliminate or compete with the variety of providers available; the project was designed to establish a series of health care alternatives which could provide credible services easily accessible and appropriate to village users, but which could also refer patients to more highly skilled care in district or provincial hospitals when the nature of the illness called for it.

The health care provider chosen when people are ill may be determined by a variety of factors, such as convenient location, cost, reputation and personal characteristics of the provider. Another factor which appears to be important in determining which group of providers is chosen is the ill person's (or his family members') assessment of the severity of the illness or injury. At least one survey of rural villagers indicated that when the illness was considered minor (about two-thirds of all reported illness were minor), only slightly more than 20% of those ill sought medical care from government sources, while 66% went to a drugstore or to indigenous and traditional practitioners. On the other hand, when villagers judged their illness to be a serious medical problem (about one-third of all ill persons), over 65% chose a government source of health care; 19% went to a private modern provider; only 12% went to a drugstore, indigenous or traditional practitioners (Day and Leoprapai, p.60). These findings suggest that data on utilization of government medical care services must be reviewed carefully, and that the importance and credibility of government sources -- at least for medical care -- may be underrepresented in some surveys.

Figure 2 outlined the wide range of health care sources the rural population may choose from when ill, depending on the nature and severity of the illness or injury. These sources include both government and private, modern and traditional providers, located in the villages or in district and provincial towns (these sources have also been described in Monograph 1 of Volume II). Briefly, these providers include:

Government-supported providers:

- Provincial hospital
- District hospitals
- Subdistrict health centers
- Midwifery centers
- Mobile clinics
- Health post volunteers
- Tambon "doctors" (providers trained in first aid and herbal medicine in each subdistrict by the Ministry of Interior)

Private modern providers:

- Physicians and others in clinics (primarily government hospital physicians who practice privately outside official hours)
- Private hospitals

Indigenous and traditional providers:

- Traditional herbalists (many of whom are licensed by the MOPH) and other practitioners of ancient healing arts, such as massage, compresses, etc.
- Spirit doctors (who use occult methods to deal with problems, often of psychogenic origin)
- Injectionists (persons such as former military medics, who have had some on-the-job experience in medical care and give injections of drugs bought from local pharmacies)

Commercial providers:

- Large pharmacies (usually in provincial and district towns)
- Small village shops (which sell drugs and often many other types of staple goods)

The variety of providers available have a differing range of skills and services with which to meet the medical care needs of the village population. For example, the services provided by a traditional herbal practitioner or a spirit "doctor" are much more limited than those provided by a physician at a district or provincial hospital. This fact may seem obvious, but to many villagers, who call all health care practitioners "doctor", the distinctions between background training and qualifications may be less clear. Therefore, when they seek care for an illness, rural villagers may base their decision less on the provider's formal qualifications, and more on such factors as the provider's proven reputation for cures, the perceived "strength" of the medicine used, and the personality of the provider.

The providers listed above may also be categorized by what their services/ medications cost the person who is ill. (Except in provincial hospitals, providers normally call their fees a "charge for medicine"; no separate service fee is charged, but is incorporated into the "cost of medicine".) The type of providers are categorized as low cost, moderate cost, or higher cost providers in Table 28.

The rural villagers sampled in the Project Community Health Surveys who said they were ill in the two weeks previous to interviews reported the first provider who treated them as summarized in Table 30. About 90% to 95% of all people who reported being ill sought some type of medical assistance; about one-third used more than one provider. In Project implementation areas there occurred a substantial increase in utilization of government-supported medical care services: utilization in the combined project areas rose 10% between the baseline and follow-up periods.

Table 29

Medical Care Providers Categorized by the Costs of Their Services for Outpatient Care, 1979

(20 Baht = 1 US Dollar)

| | |
|---|---|
| Low-cost providers (average charge under 25 baht) | |
| | Drug store |
| | Traditional herbalist |
| | Spirit doctor |
| | Tambon doctor |
| | Health post volunteer |
| Moderate-cost providers (average charge 25-50 baht) | |
| | Midwifery center |
| | Subdistrict health center |
| Higher-cost providers (average charge 50-100 baht) | |
| | District hospital |
| | Provincial hospital |
| | Private clinic |
| | Private hospital |

Source: Community Health Surveys

Table 30

First Source of Medical Care Chosen by Those Ill in the Two Weeks Previous to Interviews in Areas $E_1$, $E_2$, $C_1$, and $C_2$, 1975-1979

| Source of Medical Care | $E_1$ | | | | $E_2$ | | | | $C_1$ | | | | $C_2$ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline | | Follow-up | | Baseline | | Follow-up | | Baseline | | Follow-up | | Baseline | | Follow-up | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Government Services: | | | | | | | | | | | | | | | | |
| Health post volunteers[a] | 0 | 0 | 10 | 3.7 | 10 | 1.1 | 36 | 5.5 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 5.1 |
| Health centers[b]/district hospitals | 86 | 12.2 | 48 | 17.6 | 63 | 6.6 | 102 | 15.5 | 41 | 8.0 | 22 | 8.9 | 7 | 4.0 | 10 | 7.3 |
| Hospitals[c] | 86 | 12.2 | 31 | 11.4 | 81 | 8.5 | 50 | 7.6 | 29 | 5.7 | 20 | 8.1 | 22 | 12.4 | 5 | 3.6 |
| Government Services Subtotal | 172 | 24.4 | 89 | 32.7 | 154 | 16.2 | 188 | 28.6 | 70 | 13.7 | 42 | 17.0 | 29 | 16.4 | 22 | 16.0 |
| Private Sector Services: | | | | | | | | | | | | | | | | |
| Drug stores | 344 | 48.7 | 98 | 36.0 | 508 | 53.4 | 322 | 49.0 | 304 | 59.5 | 129 | 52.4 | 104 | 58.8 | 69 | 50.4 |
| Indigenous healers | 67 | 9.5 | 29 | 10.7 | 115 | 12.1 | 46 | 7.0 | 66 | 12.9 | 27 | 11.0 | 20 | 11.4 | 22 | 16.1 |
| Private physicians | 51 | 7.2 | 28 | 10.3 | 77 | 8.1 | 47 | 7.2 | 35 | 6.9 | 11 | 4.5 | 16 | 9.0 | 6 | 4.4 |
| Others | 33 | 4.7 | 16 | 5.9 | 63 | 6.6 | 33 | 5.0 | 16 | 3.1 | 25 | 10.2 | 5 | 2.8 | 8 | 5.8 |
| Private Sector Services Subtotal | 495 | 70.1 | 171 | 62.9 | 763 | 80.1 | 448 | 68.2 | 421 | 82.4 | 192 | 78.0 | 145 | 81.9 | 105 | 76.6 |
| No Care | 39 | 5.5 | 12 | 4.4 | 35 | 3.7 | 21 | 3.2 | 20 | 3.9 | 12 | 4.9 | 3 | 1.7 | 10 | 7.3 |
| Total | 706 | 100.0 | 272 | 100.0 | 952 | 100.0 | 657 | 100.0 | 511 | 100.0 | 246 | 100.0 | 177 | 100.0 | 137 | 100.0 |

[a] Health post volunteers were trained by the Project only in $E_1$ and $E_2$; the evaluation design called for no training of HPVs in $C_1$ and $C_2$ until after final data collection was completed. However, in $C_2$, the adjacent Lampoon Province, village health volunteers were trained after 1977 when the MOPH launched the national primary health care scheme.

[b] In baseline surveys, "government health centers" included "district medical and health centers" which have since been renamed "district hospitals" and are so listed in the follow-up survey data. Therefore, these two categories are combined in the follow-up data for comparison with baseline data.

[c] The category "hospitals" in the baseline data included both the government provincial hospital and a few small private hospitals, although district hospitals had not yet been so named and were therefore not included in this category. The categories "Provincial Hospital" and "Private Hospital" in the follow-up data are combined in one category comparison with the "hospital" category in the baseline data; however, private hospital usage by the rural populace is minimal, ranging between 0.7% and 2.2% only.

Source: LHDP Community Health Surveys.

Utilization of government-supported providers in the combined control areas rose only 1.5% in the same period. In Project areas, the increased use of government-supported providers was mostly a result of increasing use of rural health facilities and health post volunteers; utilization of the Provincial Hospital decreased. In the $C_1$ control area, use of the provincial hospital increased considerably, and use of rural health services only grew slightly. The $C_2$ control area reflected a pattern similar to project areas: provincial hospital use declined by 8.8%, and use of rural facilities increased.

The increased utilization of government-supported sources of medical care was accompanied by decreases in use of some private sector providers. In the $E_1$ project area, sharply decreased use of drug stores was the main factor responsible for the decline in private sector service utilization; use of other private healers increased. In the $E_2$ area, use of all types of private sector providers decreased. Drug store use declined in both control areas, accounting for much of the decrease in private sector service utilization.

About one-third of the ill persons who sought medical care were treated by more than one provider. In both the baseline and follow-up surveys, there was a clear difference between the provider who was chosen first and those chosen subsequently. First, although about 50% of ill people went to a drug store as the first source of treatment, only 10% to 20% went to a drug store when they used a second practitioner. Use of government-supported providers -- particularly health centers, district hospitals, and the provincial hospital -- increased sharply for ill people who chose a second provider. In Project areas, the proportion of ill people who used government-supported sources increased substantially in the follow-up period, but use of these providers was even higher when a second source was chosen.

Ill persons who used a second provider also increasingly used private providers, such as private clinics and indigenous practitioners.

These Community Health Survey findings suggest that people with minor ailments largely go to drug stores to buy medicine for self treatment. If the illness does not improve, about one-third of those ill seek a second source of care; they are also much less likely to go to a drug store, but instead choose government and some private sources at increasing rates. The results also seem congruent with other studies indicating that ill people go to drug stores most frequently when the illness is minor, but seek government and modern private sector providers when they perceive the illness to be more serious.

Utilization and Economic Status

Utilization patterns by ill persons of different economic status showed considerable differences,which generally held true in both the baseline and follow-up periods. Poor villagers tended to use the lower-cost, private sector providers, such as drug stores and indigenous or traditional practitioners, much more frequently than did their better-off counterparts. (Use of drug stores decreased overall and within each economic group, but the decline in use was least among the poor.) Prosperous villagers tended to use the more expensive private physician clinics frequently.

Economic status -- especially poverty -- appeared to influence utilization of government-supported medical care services in Project areas for the baseline period, but to a much lesser extent in the follow-up. In the $E_1$ and $E_2$ project areas the follow-up survey data indicated poor people used services at rural health facilities (district hospitals, health centers, and midwifery centers) at levels approximately equal to rates for the population as a whole. Moreover, the largest proportionate increases in the rates of medical care service utilization at rural government facilities were among the poor. Use of the provincial hospital was generally highest for the better-off villagers and lowest for the poor in the baseline period; in the follow-up period, these differences largely disappeared (and hospital use declined overall). When health post volunteers became available, they were utilized equally by poor and middle-level villagers in both project areas (and the $C_2$ control area). However, no prosperous villagers sought medical care from health post volunteers.

Differential utilization of government-supported medical care services in the control areas, with few exceptions, changed much less than in project areas. Poor people used rural health facilities and the provincial hospital least during the baseline period; prosperous villagers used these services the most in the baseline period. This pattern generally held true in the follow-up period. Among government supported practitioners, only the health post volunteer was used equally for medical care by people of both poor and middle-level economic status (as in the Project areas, no prosperous villagers used the health post volunteer).

Summary of Results

Several major trends have been observed in the rural population's use of illness care services.

- The rural ill have most frequently gone to drug stores as a first source of care; 20% or less have gone to government sources. When a second source of care is used, it is more likely to be a government provider.

- In the follow-up surveys, the proportion of ill people in Project areas who chose government-supported providers increased over 10%, whereas in control areas, the increase averaged under 2%. The increase in utilization in project areas was mostly due to (1) increasing use of rural health facilities (which had increased in number and which had wechakorn present) and decreasing use of the Provincial Hospital; and (2) the addition of Project-trained health post volunteers.

- Poor people, who generally experienced the highest illness rates, also used government-supported providers at the lowest rate of all economic groups and used the drug store at the highest rate in all baseline surveys. Follow-up data in Project areas indicated that the poor were served by government-supported providers at rates which had increased to levels comparable with other economic groups. Similar changes did not occur in control areas.

- Utilization of health post volunteers in all areas where they had been trained (including the $C_2$ control area) accounted for about 5% of medical care services received by the rural population. HPV services were used equally by people of poor and middle-level economic status, but not at all by the prosperous.

CHAPTER 5

# SUMMARY OF RESULTS, OBSERVATIONS AND IMPLICATIONS

Two major outcomes of Project efforts were the development of large cadres of community health volunteers to broadly extend primary services to every village, and the development of community health paraphysicians from four types of existing government health personnel to expand the range of services available at village-level midwifery centers, subdistrict-level health centers, and district-level hospitals. The combination of community health volunteers in each village and community health paraphysicians in rural health facilities greatly enhanced the capacity of the governmental health care system to reach and serve the majority of rural villagers who previously were not covered or chose not to use government-supported health service. Concurrently the Ministry of Public Health built many new health facilities in Lampang as part of its national program to improve rural health care in Thailand. Improving the availability and accessibility of health services was expected to lead to improved utilization of services by the target populations and, ultimately, to improved health status of the population. During the five-year period observed in Lampang, there was great improvement in the availability of services, substantial improvement in the accessibility of services, and moderate improvement in the utilization of services, as summarized and discussed in this chapter.

## AVAILABILITY AND ACCESSIBILITY OF HEALTH SERVICES IN LAMPANG

When project operations were begun in 1974, the provincial health care system reached only 5% of villages with a midwifery center, 2% of villages with a child nutrition center, 5% of subdistricts with a health center, and 27% of districts with a district hospital (called "district medical and health center" at that time). When project interventions were concluded in 1979, virtually 100% of villages had a health post manned by a health post volunteer; 59% of the villages were served by trained traditional midwives; 5% of the villages were served by a government midwifery center (mostly staffed with wechakorn midwives); 90% of the subdistricts were served by a health center (mostly staffed with a wechakorn, midwife and/or sanitarian health worker); and 67% of the districts were served by a district hospital (staffed by a physician and/or wechakorn paraphysician, nurses, nurse aides, midwife and/or sanitarian health workers). A summary of these changes is provided in Table 31.

Table 31

Summary of Area Coverage by Rural Health Services in Lampang Province, 1974 to 1979

| | 1974 | 1979 | % Increase/Decrease |
|---|---|---|---|
| Villages with Health Post and HPV | 0% | 100% | +100% |
| Villages with Trained Traditional Midwife | unknown | 59% | + 59% (or lower) |
| Villages with Midwifery Center | 5% | 5% | 0% |
| Villages with Child Nutrition Center | 2% | 17% | + 15% |
| Subdistricts with Health Center | 57% | 90% | + 33% |
| Districts with District Hospital | 27% | 67% | + 40% |

Table 32

Total Provincial Health Manpower Available in Lampang, 1974 and 1979

| Total Health Manpower for Whole Province | 1974 | 1979 | % Change |
|---|---|---|---|
| Village health post volunteers* | 0 | 918* | ++++ |
| Village health communicators* | 0 | 5,359* | ++++ |
| Trained traditional birth attendants* | 0 | 352* | ++++ |
| Sanitarian health workers | 59 | 63 | +7% |
| Government midwives | 76 | 110 | +45% |
| Nurse aides | 37 | 179 | +384% |
| Nurses | 51 | 97 | +90% |
| Paraphysicians, Wechakorn* | 0 | 92* | ++++ |
| Physicians | 17 | 41 | +141% |

*Trained by Lampang Project

Perhaps the greatest progress, in terms of the availability of health services, was made in the training of 6,629 community health volunteers for village-level health care and in the training and development of 92 wechakorn paraphysicians primarily for rural health facilities. These two interventions greatly increased the availability of government-supported health services, geographically and demographically distributed to cover a rural population of over 600,000 people who resided in 592 villages of Lampang Province. But beyond the health manpower increases brought about by the Lampang Project, the Ministry of Public Health also assigned many more medical and health care providers to Lampang during the five years observed from 1974 to 1979. A summary of the provincial health manpower changes occurring in Lampang during this period is provided in Table 32.

A striking number of community health volunteers and community health paraphysicians were trained by the Project. Just as striking is the number of Ministry of Public Health personnel assigned to Lampang who are illness care providers: the numbers of physicians, nurses, and nurse aides has increased markedly, but there are only low to moderate increases of government midwives and sanitarian health workers - the backbone of rural health services. The increase in sanitarians was almost negligible, as was the increase in the number of midwives - especially when one considers that these numbers include the 51 midwives trained as wechakorn (leaving only 59 others as opposed to 76 in 1974).

Table 33 provides a summary of the changes occurring from 1974 to 1979 in the average number of various types of personnel and volunteers for every 100,000 rural residents. The most numerous health care providers in 1979 were the community health volunteers, wechakorn paraphysicians, and government midwives. Of government health workers, the greatest changes were in the numbers of nurse aides, nurses and physicians per 100,000 population, reflecting the Ministry's aim to meet the public demand for illness care services. Table 34 expresses these ratios in terms of the average population per type of government health personnel and community health volunteer in Lampang in 1974 and 1979, providing a reasonable estimate of average population size covered by each type of health worker.

The overall increase in the availability of health manpower and health facilities in Lampang has been noteworthy both in terms of geographic coverage and population coverage by personnel and facilities. While this greatly enhances the accessibility of rural health care services to consumers, other factors of accessibility must also be considered.

Table 33

Number of Rural Health Service Personnel and Community Health Volunteers per 100,000 Villagers in Rural Areas of Lampang in 1974 and 1979

| Type of Personnel/Volunteer | Number Available for 100,000 Rural Residents | | |
|---|---|---|---|
| | 1974 | 1979 | % Change |
| Village Health Post Volunteers [a] | 0 | 134 | ++++ |
| Village Health Communicators [a] | 0 | 870 | ++++ |
| Trained Traditional Birth Attendants [a] | 0 | 56 | ++++ |
| Sanitarian Health Workers | 9 | 9 | -0- |
| Government Midwives | 13 | 18 | +38% |
| Nurse Aides | 0.5 | 3 | +500% |
| Nurses | 0.5 | 2 | +300% |
| Wechakorn Paraphysicians [a] | 0 | 13 | ++++ |
| Physicians | 0.3 | 1 | +233% |

[a] Trained by Lampang Project

Table 34

Average Number of Total Provincial Population and of Rural Population Per Government Health Worker and Community Health Volunteer in Lampang, 1974-1979

| Type of Personnel/Volunteer | Average Number of Provincial Population | | | Average Number of Rural Population | | |
|---|---|---|---|---|---|---|
| | 1974 | 1979 | % Change | 1974 | 1979 | % Change |
| Village Health Post Volunteers | NA | NA | NA | 0 | 668 | ++++ |
| Village Health Communicators | NA | NA | NA | 0 | 115 | ++++ |
| Traditional Birth Attendants | NA | NA | NA | 0 | 346 | ++++ |
| Sanitarian Health Workers | 10,789 | 10,413 | -4% | 11,635 | 11,350 | -2% |
| Government Midwives | 8,376 | 5,963 | -29% | 7,807 | 5,572 | -29% |
| Nurse Aides | 17,205 | 3,727 | -78% | 197,788 | 30,647 | -85% |
| Nurses | 12,482 | 7,904 | -37% | 197,788 | 61,294 | -69% |
| Wechakorn Paraphysicians | NA | 7,130 | NA | NA | 7,960 | NA |
| Physicians | 37,446 | 16,000 | -57% | 296,681 | 87,563 | -71% |

Distance traveled for health services is an important factor in assessing the accessibility of services. In Lampang the majority of people who came to rural health facilities traveled less than 4 kilometers, but some 10% to 20% traveled from distances greater than 9 kilometers. Those that came from long distances generally arrived on motorcycles or small pickup trucks, but 80% to 90% rode bicycles or motorcycles from shorter distances. About half of those coming for services spent less than ten minutes traveling time, about 80% traveled less than 30 minutes, and only 2% to 5% had traveled for more than an hour.

The costs to service recipients for services were very nominal: 35% to 56% of consumers who received services from rural health facilities paid less than one baht ($0.05). Over 90% of all consumers of rural health services paid less than 30 baht and 60% to 70% of all consumers paid under 10 baht ($0.50) for services received in both baseline and followup surveys.

Project surveys indicate that in the postintervention period consumers of health services traveled somewhat farther, traveled longer in time, paid a bit more for transportation, and paid slightly more for services received. These findings could suggest that access to health services may have become more difficult. On the other hand, these facts could also reflect improved transportation available, as well as improved credibility of health service providers and facilities and an increased willingness by consumers to come from farther distances and pay more for better care. Whatever factors operated to increase somewhat the cost of services to consumers, both in terms of time and money, these changes do not seem to reflect diminished access to health services because, in fact, the utilization of health services increased.

Access to community health volunteers' services, particularly those of the health post volunteers, is particularly noteworthy. Volunteers are close to the people they serve, both socially and geographically, and their services are very low cost. For example, the donation for a month's supply of oral contraceptives distributed by health post volunteers is one to three baht ($0.05-0.15). The community health survey indicated that in 1979 up to 30% of women using oral contraceptives received their supplies from health post volunteers. In a small survey of rural contraceptive users, over 80% of those using oral contraceptives said they had chosen to get their monthly supplies from health post volunteers because the volunteers were "conveniently close".

The cost of traditional midwive services is also low, and traditional midwives are conveniently close. Payments for TBA services are made in both cash and in kind, and the amount varies according to the means of the household receiving her services. TBAs often maintain lifelong relationships with the families they have served and the families hold them in respect.

The Project strategy to train community health volunteers was founded on indigenous factors in the village setting which contribute to the ease of access to village-based health care. Health post volunteers live in and are familiar with the village they serve; their services are very low in cost, and they respond to existing villager demands for health and family planning services. This is also true for traditional birth attendants who already have an established, respected role in the village, and who are easily accessible to the families they serve.

## UTILIZATION OF HEALTH SERVICES BY TARGET GROUP CHILDREN

The acceptance and utilization of health services by target group children in all Project areas increased with few exceptions. In the $E_1$ area, 66% of children utilized government-supported services, virtually achieving the objective of the Project in that area. When $E_1$ and $E_2$ areas are combined, 62% of children had utilized health services when the final survey was conducted. While utilization of particular types of health services did not reach such a high level, project intervention areas demonstrated broader coverage of children with health promotion and disease prevention services than control areas. Nutrition services, well-child clinic services, and "other" child health services increased well over 40% in Project areas, but increased only 5% to 23% in control areas. These findings are summarized in Table 35.

A much larger proportion of target group children in Project intervention areas was reached by government health services than in the control areas. Medical care services increased slightly in all project areas, but with little differences between project intervention areas and control areas.

Immunization services coverage of children increased in the $E_1$ area but decreased in all other areas, including $E_2$. This was an unexpected result in light of the fact that the Ministry of Public Health had strongly promoted an expanded program of immunization, but it probably reflects the result of the chronic problem experienced in keeping health facilities supplied, particularly with biologicals needed for immunization programs.

Table 35

Proportion of Children Under Age 6 Who Used Government-Supported Services in Lampang (Baseline and Follow-up Surveys)

| Type of Child Health Services | Area | Baseline | Follow-up | % Increase/ Decrease |
|---|---|---|---|---|
| Any Child Health Service | $E_1$ | 30.1% | 65.5% | +35.4% |
| | $E_2$ | 42.4% | 60.3% | +17.9% |
| | $E_1+E_2$ | 37.5% | 62.2% | +24.7% |
| | $C_1$ | 42.7% | 39.5% | -3.2% |
| | $C_2$ | 42.4% | 50.0% | +7.6% |
| Medical Care Services | $E_1$ | 19.1% | 20.5% | +1.4% |
| | $E_2$ | 10.4% | 18.8% | +8.4% |
| | $C_1$ | 12.4% | 16.7% | +4.3% |
| | $C_2$ | 7.6% | 16.3% | +8.7% |
| Immunization Services | $E_1$ | 13.1% | 24.9% | +11.8% |
| | $E_2$ | 33.7% | 23.3% | -10.4% |
| | $C_1$ | 26.6% | 20.9% | -5.7% |
| | $C_2$ | 30.6% | 10.5% | -20.1% |
| Nutrition, Well Child, and Other Child Health Services | $E_1$ | 3.1% | 51.7% | +48.6% |
| | $E_2$ | 5.9% | 41.8% | +35.9% |
| | $C_1$ | 7.3% | 12.5% | + 5.2% |
| | $C_2$ | 15.1% | 38.3% | +23.2% |

In Project intervention areas, there was a clear shift in child health services utilization towards rural health facilities and village-based providers, with a concurrent reduction in Provincial Hospital use. In contrast, the shift was in the opposite direction -- towards greater use of the provincial hospital -- in the control areas.

# UTILIZATION OF HEALTH SERVICES BY TARGET GROUP WOMEN

A summary of the proportions of target group women using government-supported services in Project intervention and control areas is provided in Table 34. In all project areas, including control areas, there was increased utilization of health services by target group women, reaching 45% in intervention areas and 43% in control areas. The highest levels of health services utilization by target group women, however, were for delivery care services, prenatal care services, and family planning services.

Over 80% of women who had delivered a child were attended by trained government personnel or by trained traditional midwives in the Project intervention areas, but only 43% to 46% of this group were attended by trained personnel in the control areas. Although there is some general increase in the proportion of deliveries attended by government health personnel, the greatest proportion of deliveries were done by traditional midwives. The proportion of all deliveries which are attended by traditional midwives, however, is gradually shrinking in favor of government health providers. In both baseline and followup surveys, the majority of deliveries were done at home, although there is some increase in the proportion of deliveries done at the hospital. In general, the contributions of traditional birth attendants, government midwives, and wechakorn paraphysicians account for most of the government-supported delivery care services in project intervention areas.

Prenatal care services were utilized by 66% to 70% of target group women who were pregnant in project intervention areas, and by 63% to 75% of pregnant target group women in the control areas. Postnatal care services, however, covered only 15% to 18% of target group mothers, only slightly higher than in the control areas. Most respondents admitted that postnatal care services would not be sought unless some abnormality or problem developed.

Family planning services and contraceptive use were already high when baseline surveys were conducted; over 50% of all eligible target group women actively practiced contraception in all areas surveyed, including in control areas. These high rates did increase over the period observed, and when final surveys were conducted in 1979, between 56% and 71% of eligible target group women in intervention areas practiced contraception, and between 65% and 76% of eligible women in control areas practiced contraception. 82% to 93% of all contracepting eligible target group women in project intervention areas had received their supplies or services from government supported sources, and in control areas this type of service coverage ranged from 66% to 94%. These findings are not attributed to Project interventions because

Table 36

Proportion of Target Group Women Using Government-Supported Services in Baseline and Follow-up Surveys

| Women's Health Services: | Area | Baseline | Follow-up | % Change |
|---|---|---|---|---|
| Any Type of Service | $E_1$ | 36.2% | 44.7% | +8.5% |
| | $E_2$ | 30.1% | 45.0% | +14.9% |
| | $C_1$ | 40.7% | 42.8% | +2.1% |
| | $C_2$ | 30.1% | 43.6% | +13.5% |
| Delivery Care Services | $E_1$ | 44.0% | 88.1% | +44.1% |
| | $E_2$ | 41.8% | 78.3% | +36.5% |
| | $C_1$ | 31.9% | 42.5% | +10.6% |
| | $C_2$ | 30.9% | 45.8% | +14.9% |
| Prenatal Care Services | $E_1$ | 55.7% | 70.3% | +14.6% |
| | $E_2$ | 51.9% | 66.4% | +14.5% |
| | $C_1$ | 53.2% | 75.3% | +22.1% |
| | $C_2$ | 40.2% | 62.5% | +22.3% |
| Postnatal Care Services | $E_1$ | 9.6% | 17.8% | +8.2% |
| | $E_2$ | 11.6% | 15.3% | +3.7% |
| | $C_1$ | 11.5% | 13.7% | +2.2% |
| | $C_2$ | 11.3% | 12.5% | +1.2% |
| Family Planning Services: | | | | |
| (1) Proportion of currently married couples (with wife age 15-44 years) who practice contraception | $E_1$ | 56.0% | 70.6% | +14.6% |
| | $E_2$ | 53.7% | 55.8% | +2.1% |
| | $C_1$ | 50.7% | 65.2% | +14.5% |
| | $C_2$ | 59.8% | 75.6% | +15.8% |
| (2) Proportion of all contracepting married women who received family planning services from government sources, including volunteers | $E_1$ | 94.6% | 92.7% | -1.9% |
| | $E_2$ | 83.4% | 82.2% | -1.2% |
| | $C_1$ | 95.2% | 94.9% | -0.3% |
| | $C_2$ | 61.9% | 65.6% | +3.7% |

they reflect a pattern that can be observed in many areas of northern Thailand, including Lampang. However, the health post volunteers provided oral contraceptives to 20% to 34% of all orally contracepting women in Project intervention areas. Primarily through the contribution of health post volunteers, the Project's efforts to bring family planning services closer to the women using tham has been generally successful.

## UTILIZATION OF ILLNESS CARE SERVICES BY THE RURAL POPULATION

The Community Health Surveys conducted by the Project assessed the level of recent illness among family members of households included in the sample, and then pursued questions on the source and outcome of illness care services, including both government-supported providers and private sector providers. Since rural people sought health services for illness care more than other types of services, this measure provides some general observations on both the levels and the patterns of utilization of health care services.

Illness care services utilization increased about 10%, up to about 30%, in Project intervention areas, but increased only marginally in control areas. In all areas, there was a general shift towards government-supported providers and away from private sector providers, but the magnitude of this shift was greater for Project intervention areas, as seen in Table 37.

Table 37

Proportion of General Population Using Government and Private Sector Illness Care Services as a First Choice When Ill (Baseline and Follow-up)

| | Area | % Population Using Service | | % Increase/Decrease |
|---|---|---|---|---|
| | | Baseline | Follow-up | |
| Government Health Sector Service Providers | $E_1$ | 24.4% | 32.7% | +8.3% |
| | $E_2$ | 16.2% | 28.6% | +12.4% |
| | $C_1$ | 13.7% | 17.0% | +3.3% |
| | $C_2$ | 16.4% | 16.0% | -0.4% |
| Private Sector Service Providers | $E_1$ | 70.1% | 62.9% | -7.2% |
| | $E_2$ | 80.1% | 68.5% | -11.6% |
| | $C_1$ | 82.4% | 78.0% | -4.4% |
| | $C_2$ | 81.9% | 76.6% | -5.3% |

In project intervention areas the increased use of government-sponsored providers was mostly a result of increasing use of rural health facilities and health post volunteers, while hospital use decreased. The $C_2$ area, where the government's Primary Health Care Program was implemented in 1977, also reflected a pattern similar to project intervention areas; the $C_1$ area, however, reflected considerably increased use of the provincial hospital. In some Project intervention areas the health post volunteer contribution to illness care services made up almost a third of government-sponsored care provided to ill persons.

The surveys suggest that people with minor ailments largely go to drugstores to buy medicines for self treatment. About one-third of those who are ill will seek a second source of illness care, frequently a government-supported provider at the provincial hospital, a district hospital, a health center or at a midwifery center.

The surveys depended on recall for illnesses that occurred in the previous two weeks, and results therefore are affected by the recall ability of the respondent, the population sampled, and the season during which the survey was conducted, as there can be substantial seasonal variations. Another measure of illness care service coverage is to determine the estimated number of illness episodes for a full one-year period and to count the total number of illness care contacts for the same period, dividing the latter by the former. This was done for the $E_1$, $E_2$, and $C_1$ areas (the areas within Lampang Province); the results are summarized in Table 38.

Table 38

Proportion of Estimated Illness Episodes Covered by Government-Provided Illness Care Services in Project Areas (Baseline and Follow-up)

| | Area | % Population Using Service | | % Increase/Decrease |
|---|---|---|---|---|
| | | Baseline | Follow-up | |
| General population illness care service provided by government health service for estimated episodes in past year | $E_1$ | 26.2% | 55.8% | + 29.6% |
| | $E_2$ | 18.1% | 34.0% | + 15.9% |
| | $E_1+E_2$ | 19.0% | 36.5% | + 17.5% |
| | $C_1$ | 12.6% | 21.1 | + 8.5% |

Of the estimated illness episodes in the $E_1$ and $E_2$ areas, 56% and 34% respectively were "covered" by illness care services in Lampang in 1979 - a substantial increase over the baseline levels of 26% and 18% for $E_1$ and $E_2$ areas, respectively. The change was less apparent, although it still represents increased utilization, in the control area. Although there is some variation in the level of increase in the utilization of government health services, the general findings and the shifts in service providers indicated in these data substantiate the survey data presented earlier.

The overall increase in the utilization of government-supported illness care services is primarily due to increased selection of Project-trained health post volunteers and wechakorn paraphysicians, increased availability of rural health facilities and, to a limited extent, the additional health workers provided by the Ministry of Public Health. Health post volunteers provide about 5% of the total volume of illness care, including private sector sources; and in some areas, health post volunteers provide nearly a third of all government-supported illness care services.

## GENERAL CONCLUSIONS AND IMPLICATIONS

The overall experience in Lampang substantiates the validity of the project's major strategy and approach to achieve high coverage -- the development of health manpower from resources in each village and the existing provincial health care system. A high level of coverage was achieved in terms of the availability of health manpower at the levels which formerly had a gap -- the village, subdistrict and district levels. Increased utilization of health services was primarily achieved through the contributions of community health volunteers, community health paraphysicians, and the Community Health Department of the Provincial Hospital, particularly in terms of provision of medical care and family planning services.

Although some improvements were made in the provision of health promotion and disease prevention services, the major improvements were found to be in the provision of illness care and family planning services. There are at least three factors that may account for these findings: (1) there is a greater demand for illness care services and for family planning services by consumers, (2) illness care and family planning were emphasized more than health promotion and disease prevention services in the training programs, and (3) the provincial health management, supervision and support of the new health workers did not emphasize health promotion and disease prevention as much as illness care and family planning. For example, despite the Ministry's emphasis on immunizations, Lampang has experienced a chronic supply problem in obtaining sufficient vaccines and supplies needed to conduct an expanded program of immunizations. This was a major factor in the low levels of immunization coverage of the target group children. Were supplies available, were proper emphasis given in training, and were immunizations emphasized in the supervision and support of the new health workers, a much higher rate of coverge could have been achieved.

Beyond the written and verbalized policies of government health services, budgetary and manpower allocations are a more concrete expression of actual policies and program emphasis. It becomes clearer, then, that the emphasis of government spending and overall manpower development is still on medical care services more than health promotion services or disease prevention services. The government, properly, responds to public demand, and the public demand is for medical care and

family planning services. The ability of the Lampang system to meet this demand has increased the credibility of the system and is reflected by increasing rates of utilization of these services. Given the system's new credibility and given the potential of the health manpower now available in Lampang, substantial improvements can now be made in the provision of health promotion and disease prevention services if the supervision and management systems of the Provincial Health Office emphasize these services, if the supplies needed are made consistently available; and if these services are emphasized in on-the-job training and in new training programs for replacement of volunteers and personnel lost by attrition. The Project intervention areas have already demonstrated a broader coverage of children with preventive health services than in control areas, but greater emphasis on disease prevention and health promotion services is still needed.

The emphasis on medical care and family planning need not be decreased because it is responding to the perceived needs and the demand for services of the rural population. However, building on the new credibility of the health services system which has resulted from the improved coverage of the population with these services, greater emphasis should be placed on high-priority programs with greater potential for impact on the population's health and environmental conditions. The Project documented that Lampang, like most other provinces in Thailand, has a widespread problem of first and second degree malnutrition among children. Nutrition improvement programs -- with the major role being taken by community health volunteers -- should be a priority. Water supply and waste disposal should also be given high priority, again with the major role being taken by community health volunteers and village committees. The pilot program undertaken in Hang Chat for improved wells for household water supplies had promising results and is being continued in other areas of the province. Pilot programs for nutrition improvement have not been so promising, largely because they were designed to remain dependent on government health service personnel and did not give a major role to community health volunteers. Further study and advances are needed in these programs and in other high-priority programs before discernible impact on the health status of the population can be seen.

While there is generally substantial validity in the Lampang approaches to rural health care, greater efforts are now needed in programming high-priority health promotion and disease prevention activities. Building on the established role and the high performance of community health volunteers in the areas of illness care and family planning service delivery, community health volunteers should be encour-

aged and technically guided to promote and conduct local nutrition improvement programs, water supply programs, environmental sanitation and other health promotion programs. Rural health service personnel should be given the supplies, incentives, technical supervision and encouragement to expand immunizations and other disease prevention activities.

The trends in health care utilization in Lampand are most promising. A substantial increase in the total volume of services was observed, primarily as a result of the contributions of village health volunteers and wechakorn paraphysicians. The Community Health Department's mobile clinic made a significant contribution to the provision of family planning and other health and medical services in remote rural areas. Beyond the overall increase in the total volume of services, there has been a shift in utilization of services away from the Provincial Hospital towards the rural health facilities at the district, subdistrict and village levels. Where services have been made available, they have been utilized. In control areas, the shift was in the opposite direction towards the Provincial Hospital. This effect of project interventions -- greater utilization of services at the rural periphery -- is desired by both the consumers and the providers of health services. The trend has begun, and it implies that greater attention must be given to strengthening logistics of the health system to provide more services at the system's periphery. This means more emphasis must be given to the problems of supplying the rural health centers, of supervising rural health center personnel and of improving the management practices and information systems needed to support the greater volume of service provision in rural areas.

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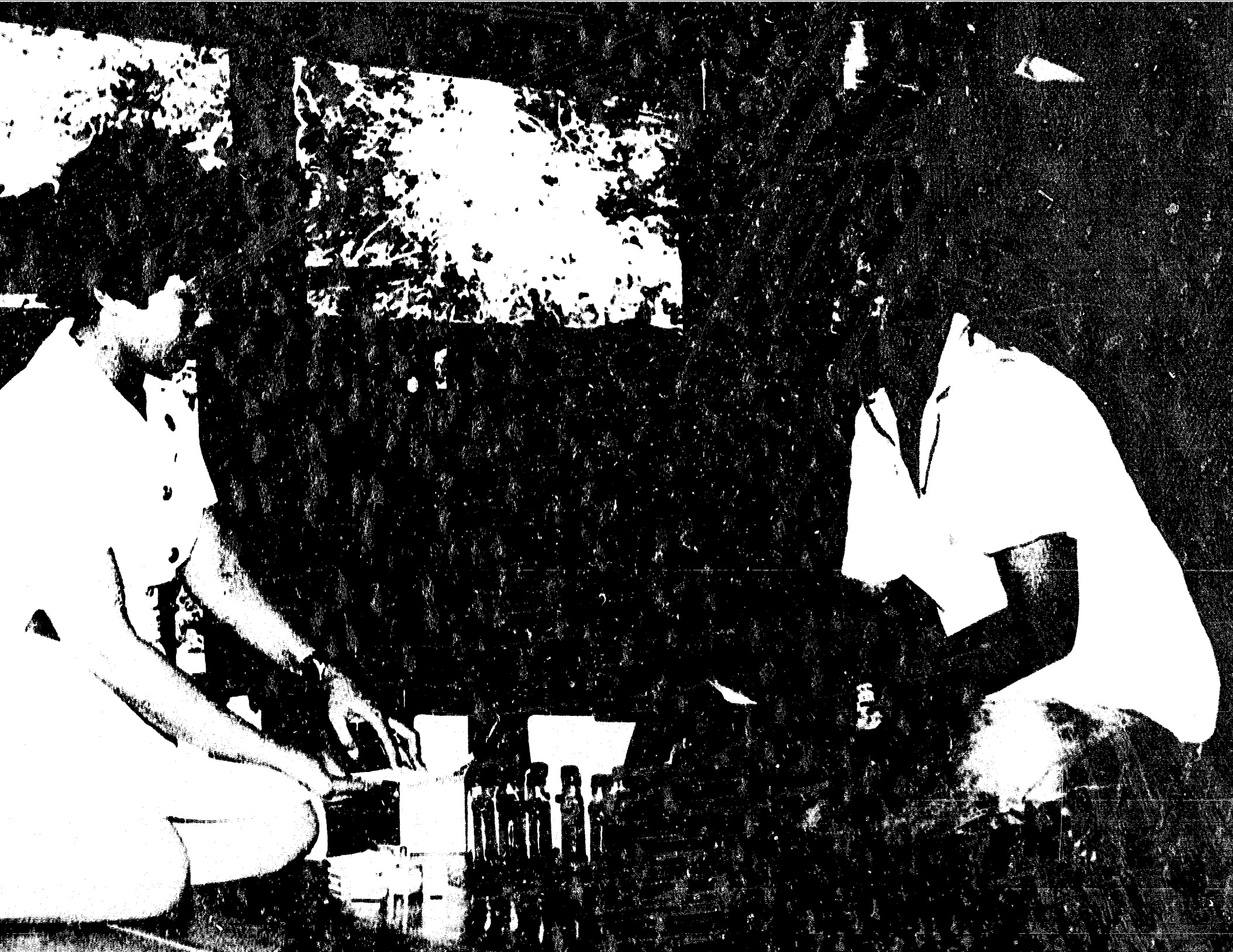

# HEALTH SYSTEM AND PERSONNEL PERFORMANCE AND COSTS

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Monograph 9

Lampang Health Development Project Documentary Series
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# INTRODUCTION AND SUMMARY OF FINDINGS

The broad scope of this monograph includes analysis of the performance of the health delivery system established in Lampang Province, and of the costs involved in operating that system. The objectives of this monograph are:

(1) to describe and assess the performance of the health delivery system that was established, and the contributions of the various facilities and personnel groups that are a part of it;

(2) to identify and analyze the costs involved in developing and operating the Lampang system, and

(3) to integrate the performance and cost data to derive some measures of the system's cost effectiveness.

Whereas Monograph 8 focussed on the availability of services and consumer utilization of services, this monograph takes a closer look at the operations and costs of the modified system that produced those services. The ultimate question to be confronted is whether the modified provincial health care delivery system provided services more efficiently (cost-effectively) in serving the needs of the population.

## SUMMARY OF MAJOR FINDINGS

The analysis of system performance and costs has revealed a number of important results, the most important of which are:

(1) While the average service output of individual health facilities has not generally increased, the total service output of the provincial health care delivery system increased greatly. The increase was a result of two major factors: the expanded number of rural health personnel and facilities, and the substantial contribution of community health volunteers.

(2) The proportion of total health services provided by rural health facilities and providers has increased, and the provincial hospital's proportionate share as a provider of all health-services has decreased.

(3) Medical care remains the predominant activity, in terms of volume of service contacts and worker time spent at all service levels.

(4) The health post volunteers have established a major role in providing simple medical care services and in oral contraceptive distribution.

(5) Although moderate improvements in some community health programs, such as nutrition and sanitation, were made during Project implementation, efforts in many other health promotion and disease prevention programs need intensified attention.

(6) The unit costs of delivering family planning and medical care services decreased as a result of the substantial contribution of health post volunteers. However, the overall costs of health care have sharply increased at the national and provincial levels; likewise, the costs per service contact of all types increased at all government health care facilities.

An overview is provided to clarify the scope and content of this monograph, to outline the overall approaches used to integrate the various sets of data and to prepare the reader for the more detailed discussions which follow.

## OVERVIEW OF ANALYSIS

### Facilities and Personnel Providing Service

The overall performance of the health delivery system -- the sum of outputs of the individual units and workers -- is a result of the numbers of facilities and personnel, and the mix of those personnel, within the system. As a part of the Ministry of Public Health's overall plan for improving health care nationally, new facilities and personnel have constantly been added to the system, making the service delivery environment a dynamic one. The first step in the analysis of system performance is to document the changes in the availability of health facilities and in the personnel who staff the facilities. This includes the change in the number of facilities, such as district hospitals and subdistrict health centers; new personnel placements which are part of the normal Ministry expansion plan; and the addition of new worker categories, such as paraphysician wechakorn and community health volunteers, which have been stimulated by the Lampang Project (changes in facility and personnel numbers are described at length in Monograph 8).

## Measuring Performance of the Delivery System and Its Workers

The provincial health care delivery system, as modified by the Lampang Project, has several major components which account for the overall output of that system. These components are:

(1) The Provincial Hospital

(2) District hospitals

(3) Subdistrict health centers and midwifery centers

(4) The community health volunteer network.

The first three components are the conventional facilities established by the Ministry of Public Health (MOPH). The fourth component, the community health volunteer network, has been added as part of the Lampang Project. The contribution of each of these service components will be examined. If the Project has achieved its goals, there should be an overall increase in the service output of the system, and a shift in the proportion of services provided at the rural level by district hospitals, health centers, and volunteer health posts. The contribution of the rural health volunteers adds a new and important dimension to the performance of the delivery system.

## Task Analysis

The amount and proportion of time spent by the various health workers at different facilities have been measured to provide insights into the pattern of their performance. These measures include:

-- The proportion of time spent in providing direct services;

-- The proportion of time spent in supportive activities; and

-- The proportion of time spent nonproductively.

The measurements also permit a review of what proportion of service time has been devoted to the various service categories, such as medical care, family planning, and nutrition. This task analysis also provides insights into which types of workers are generally involved in what types of services, and thus provides some direct measurement of how the service program emphasis of the Lamapng Project has evolved over time.

## Analysis of Costs

Major emphasis has been given to analyzing costs within the Lampang health delivery system. Some national-level cost measures are presented as a context into which the more detailed analysis of Lampang costs may be placed. Such general cost measures include:

-- Estimated national private sector and public sector expenditures on health;
-- Overall and per capita government expenditures on health;
-- Breakdown of RTG expenditures on health;
-- Total and per capita expenditures by the Ministry of Public Health; and
-- A breakdown of Ministry of Public Health expenditures by program.

Bearing the national-level cost measures in mind, the major focus of analysis is on costs within the provincial health care delivery system. A description of how the provincial budget is allocated can help to reveal priorities in health care. Cost measures presented include the following:

-- Overall and per capita provincial expenditures on health;
-- Provincial health budgetary allocations for the hospital and public health sectors;
-- Summary of budgetary allocations for the various facility types; and
-- Cost of the various personnel types.

A more detailed analysis of costs at the various service units is also presented. Analysis includes a breakdown of the types of costs involved in service delivery -- personnel costs, capital costs, maintenance and supply costs, or consumable costs. Based on measures of service time, these costs are then allocated to the various service categories, ultimately leading to a derivation of costs per service category.

Many questions naturally arise concerning the feasibility of implementing the key features of a demonstration integrated health services delivery project, such as the one established in Lampang, in other areas. These questions concern not only the effectiveness of the Project features, but also their costs and, ultimately, their cost-effectiveness. Because outside resources have been invested in carrying out the Project, the questions that must be posed are: How much additional cost is required to build and operate a system such as the one in Lampang? Was the additional investment made in Lampang worthwhile in terms of the system's increased capacity and performance? Was it really cost-effective?

Integration of Performance and Cost Data: Cost-Effectiveness

By integrating the performance and cost data, some measures of cost per service function have been derived. This is the most complex part of the overall analysis, requiring a variety of assumptions and adjustments because of incom-

pleteness or lack of precision of data. But it is the ultimate goal of this integrated analysis to provide insights concerning the extent to which the investment and reallocation of resources within the province produced changes in performance which were cost-effective.

## Sources of Data

The analysis of performance and costs outlined in the previous sections draws on data from several sources, both from the existing government health information system, and from special data generating mechanisms created by the Lampang Project. These sources include:

- -- National-level RTG and MOPH cost data
- -- Provincial health office, provincial hospital, and peripheral health facility cost records
- -- Provincial health service statistics and records
- -- Lampang Project Community Health Survey
- -- Lampang Project Task Analysis and Cost Analysis Surveys
- -- Lampang Project Administrative Analysis Survey.

As each part of the overall analysis is developed in the following pages, the nature and contribution of each of these data sources are further described.

# COMPONENTS OF THE HEALTH CARE DELIVERY SYSTEM

In the 12 districts and 78 subdistricts of Lampang Province in 1979, there was an average population of about 50,000 per district, although district populations ranged from under 15,000 to almost 150,000. Each district averaged about 1,000 square kilometers (385 square miles) in area, with a range from 500 square kilometers in the smallest district to over 2,000 square kilometers in the largest districts.

The overall structure of the provincial health care delivery system in Lampang is fully described in other Project monographs (see Monographs 1 and 5 in Volume II, and Monograph 8 in this volume). However, it may be useful to briefly review the system's components, as it is the summed output of these components that defines the health system's performance.

In 1974, when the Lampang Project began, the major components of the conventional provincial health care system established and continually expanded by the Ministry of Public Health in Lampang included:

- A provincial hospital with 300 beds
- District hospitals with 10 to 20 beds each (then called district medical and health centers)
- Subdistrict health centers
- Midwifery centers
- Child nutrition centers.

To these standard components, the Lampang Project added several new ones, not by building new facilities, but by training and organizing new types of health workers. Three major additions to the delivery system were:

(1) A village-based network of community health volunteers made up of:
- Health Post Volunteers (HPV);
- Village Health Communicators (VHV), and
- Traditional Birth Attendants (TBA).

(2) A Department of Community Health in the Provincial Hospital. To these major components were added other important Project elements designed to improve the scope and quality of service delivery in the existing components, and to facilitate interaction between them. These elements were:

A cadre of wechakorn paraphysicians assigned to the Provincial Hospital, district hospitals, subdistrict health centers, and midwifery centers.

Improvements in management and coordination between the Provincial Hospital and the Provincial Health Office.

Improvements in the patient referral network.

Figure 1 illustrates the components of the health delivery system and identifies the new personnel and volunteers introduced by the Project.

Workers in the Health Care System

The following paragraphs describe the major categories of health workers (and their basic training) encountered in the government rural health care delivery system, as these workers will be mentioned frequently.

(1) Physician. Students enter medical training after 12 years of primary and secondary school, beginning with two years of pre-clinical sciences, followed by four years of clinical training. After a one-year internship, all medical graduates are required to fulfill two years of compulsory government service. Most graduating physicians remain with the government throughout their career; the majority serve in hosptials in Bangkok or in provincial capitals. A small number of generally younger, male graduating physicians go to district hospitals each year.

(2) Nurse. After completing 10 or 12 years of primary and secondary school, nursing students may enter either a four-year degree program or a three-year nondegree program. Most training programs are currently shifting to four-year degree status. The great majority of nurses are in large general hospitals, and only a small proportion serve at the district hospital level. Nurses normally are not assigned to subdistrict health centers or midwifery centers.

## Figure 1

### Components of the Lampang Provincial Health Service System[a]

| Major Components before Project 1974 | Major Components after Project Implementation 1979 | Major Personnel in Each Component 1979 |
|---|---|---|
| Provincial Hospital | Provincial Hospital<br>Community Health Department | Doctors<br>Dentists<br>Nurses<br>* Wechakorn Paraphysicians<br>Nurse Aides |
| District Hospitals | District Hospitals | Doctor<br>Nurse<br>Midwife<br>Sanitarian Health Worker<br>Dental Hygienist<br>* Wechakorn Paraphysician<br>Nurse Aide |
| Subdistrict Health Centers | Subdistrict Health Centers | Midwife<br>Sanitarian Health Worker<br>* Wechakorn Paraphysician<br>Nurse Aide |
| Midwifery Centers | Midwifery Centers | Midwife<br>* Wechakorn (a few only) |
| Child Nutrition Centers | Child Nutrition Centers | Center attendant (villager) |
| | Community Health Volunteer Network | * Health Post Volunteers<br>* Traditional Midwives<br>* Health Communicators |

* Denotes personnel trained by the Lampang Project

[a] The Provincial Health Office is the main administrative, coordinating, and managerial center of the system; but, since it provides almost no direct services it is not included in the diagram.

(3) Nurse Aide. Nurse aides normally enter an 18-month training program after 10 years of primary and secondary school. Large numbers of nurse aides work in provincial and Bangkok hospitals, but more and more are being placed in district hospitals and other rural health centers.

(4) Government Midwife. Women normally enter midwifery training after 10 years of school. The midwifery course provided at five regional midwifery training centers lasts 18 months (one year of classroom and clinical training, six months of field work). Midwives are the largest category of health worker in the government health service system, and they are a mainstay of rural health facilities. Midwives are assigned to all facilities of the provincial health care system, except for the Provincial Hospital.

(5) Sanitarian Health Workers. Sanitarian health workers, often called junior health workers, or junior sanitarians, receive 18 months of training after completing 10 years of school. (The title in Thai for this worker category is simply "health worker"; they are generally considered multipurpose health workers). The 18 months of training in regional training centers - one year in the classroom, six months in field work - heavily emphasizes small water supply, excreta disposal and environmental sanitation, as well as first aid, preventive health care and health education. Like midwives, sanitarian health workers are a mainstay of rural health care facilities. Through seniority and promotions, they can also become district health officers, senior sanitarians, or administrators in the Provincial Health Office.

(6) Dental Aides. The dental aide is a relatively new category of worker, normally assigned to district hospitals. Trained for three years following 10 years of school, dental aides (mostly women) provide emergency dental care, extractions, temporary fillings, and cleaning and scaling for patients who come to the district hospital.

(7) Wechakorn paraphysicians. Wechakorn are a new category of worker trained by the Lampang Project. Formerly nurses, midwives, sanitarians, and nurse aides, they were trained

intensively for one year in medical care, preventive health care, and promotive health care, and are assigned to rural health facilities or to the Provincial Hospital.

(8) Community Health Volunteers. Community health volunteers are village-based primary health care workers trained by the Lampang Project. They include:
- Health post volunteers;
- Traditional birth attendants (midwives), and
- Village health communicators.

An important point to remember is that the health delivery system presented here is a government-sponsored system. There are other health care facilities and providers which are also a part of the total health care system in Lampang Province. These include several small private hospitals, private medical clinics, drug shops, indigenous herbalists, injectionists, spirit healers, and many others. As described previously in Monograph 8, the population heavily utilizes the variety of private providers available, particularly for care of illness. However, the major emphasis of this monograph is on the provincial (government-sponsored) health delivery system, which is the base on which Project additions and modifications have been made. It is the changes in the performance of this government system that are of primary concern.

A second point to remember is that a number of changes, such as the increased number of rural health centers and district hospitals, and the enlarged capacity of the Provincial Hospital, were initiated by the Ministry of Public Health independently of Lampang Project activity. They have nonetheless had an important impact on the configuration and performance of the government service delivery system.

# CHAPTER 2

# PERFORMANCE OF THE HEALTH CARE DELIVERY SYSTEM

## SOURCES OF DATA

A wealth of information has been collected to measure the performance of the government-supported health care delivery system in Lampang. However, for a variety of reasons, performance data are not uniform in scope of detail for each of the major components of the delivery system.

Four major sources provided the quantitative data used in measuring performance of the service units and their personnel within the Lampang health delivery system. A description of these sources follows.

### Provincial Health Reports and Service Statistics

These reports, both monthly and annual, provide activity data for the Provincial Hospital, district hospital, health centers and midwifery centers. Major service categories, such as medical care, services to mothers and children, and family planning, are included. The Provincial Hospital provides the most complete set of records and service data of all government facilities. Service statistics and other records at rural health facilities -- district hospitals, subdistrict health centers, and midwifery centers -- were not always as complete or accurate as in the Provincial Hospital. However, a much more comprehensive Task Analysis study -- both baseline and follow-up -- was conducted in a large sample of facilities in the demonstration and control areas. These data, together with the service data available, permit a detailed analysis of performance in these facilities.

### Project Task Analysis

The Task Analysis was primarily a time-and-motion survey of a large number of service facilities of all types (although it did not cover village health posts). It provided estimates of the total service output of each facility type, a detailed breakdown of the work time each type of health worker actually spent in providing services, and how much time was devoted to different service categories. The Task Analysis was conducted before and after Project implementation in eight experimental districts ($E_1$ and $E_2$), and in the $C_1$ control district. (The Task Analysis was

not done in the $C_2$ control district outside of Lampang Province.) The number of facilities of each type sampled is summarized in Table 1.

Table 1

Health Facilities Sampled in the Task Analysis

| Type of Facility | Baseline Surveys (1975) | | | Follow-up Survey (1978) | | |
|---|---|---|---|---|---|---|
| | Total Facilities | Facilities Sampled | % of Total | Total Facilities | Facilities Sampled | % of Total |
| Provincial hospital | 1 | 1 | 100% | 0 | 0 | 0% |
| District hospitals | 2 | 2 | 100% | 4 | 4 | 100% |
| Subdistrict health centers | 34 | 27 | 79% | 50 | 33 | 66% |
| Midwifery centers | 28 | 22 | 79% | 22 | 15 | 68% |

Observations of service contacts and activities of all health workers were made at each of the facilities sampled for a period of five or ten days. In addition, service users were also interviewed at the facility. They were asked about travel to the facility, cost of care, and perceptions of the service received.

The Task Analysis survey was conducted only once in the Provincial Hospital,so there are no follow-up data sets for comparison. Moreover, the methodology used in the Provincial Hospital Task Analysis study was somewhat different from that used in the rural health facilities, making comparisons between the two types of facilities more complicated. The Lampang Project had a less important role in the direction and scope of Provincial Hospital services than it did in other service facilities, and a follow-up study in the Provincial Hospital was therefore not considered crucial.

## Health Volunteer Reports

Reports on health post volunteer and traditional birth attendant (TBA) activities, compiled each month by district, are actually a part of the provincial health reporting system. But because these reports were initiated by the Lampang Project as a new reporting component not formerly present in the provincial information system, they are given special mention. The health post volunteer reports provide information on numbers of curative contacts, referrals, family planning contacts and supplies distributed. The TBA reports record the number of deliveries and pre- and post-natal contacts.

Analysis of health volunteer performance presented unique problems in terms of measuring their contribution and comparing and integrating data on their performance with that of other providers in the delivery system. On the one hand, because volunteer activities are irregular, rather than routine, and are only conducted in volunteers' spare time, there was no possibility of doing a work observation study similar to the Task Analysis. But health volunteer service records, though limited in scope, did provide much information about their work. It was necessary to integrate all of the data sets -- Task Analysis, service data from facilities and from volunteers -- to permit broad comparisons of performance of the different health delivery components.

Community Health Survey

The Community Health Survey provides supplementary data not readily available from other sources. Data on consumer service utilization can support observed changes in the pattern of provider service delivery.

Together, these four major sources of data provide a composite picture of overall performance of the health care delivery system.

Use of the Data

Review of the performance of the various components of the Lampang provincial health care delivery system is based on several measures:

(1) The overall service output of each system component (hospitals, health centers, midwifery centers); that is, the average number of services in each service category delivered at each service level.

(2) The amount of time spent by all workers in providing care at different facilities, including a breakdown of the work time of each worker type in those facilities.

(3) The distribution of service time into the various service categories (medical care, maternal and child health (MCH), family planning), by each type of worker within each service level.

Each of these measures is important in developing an analysis of costs by facility level and by service category.

## THE LAMPANG PROVINCIAL HOSPITAL

The Provincial Hospital has undergone substantial changes in the period of Lampang Project operations as part of the MOPH's phased plan to upgrade several provincial hospitals to regional status. The hospital first added a new and expanded outpatient building in 1977, a much-enlarged inpatient wing will be completed by the end of 1981, and an affiliated nursing school graduated its first class in late 1981. Opening of the outpatient wing in 1977 brought a sharp increase in outpatient service capacity and utilization. The hospital's new bed capacity will be, ultimately, more than double the pre-Project level. In 1975, the Lampang Project also stimulated the creation of the hospital's Community Health Department; and in 1976, the newly-trained wechakorn were assigned to a number of inpatient and outpatient departments. Table 2 summarizes some major hospital statistics which reflect the changes in the hospital's capacity and organization.

Table 2

Selected Lampang Provincial Hospital Statistics
1974-1979

| Item | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|
| Beds | 309 | 316 | 316 | 371 | 561 [a] | 561 |
| Inpatients | 26,896 | 29,615 | 28,999 | 30,897 | 29,850 | 28,920 |
| Daily Inpatient Census | 320 | 337 | 344 | 386 | 426 | 379 |
| Percent of Inpatient Capacity | 104% | 107% | 109% | 104% | 76% | 68% |
| Average Stay (days) | 4.3 | 4.2 | 4.3 | 4.6 | 5.2 | 4.8 |
| Outpatients | 118,879 | 144,399 | 157,140 | 185,403 | 185,533 | 194,525 |
| Average/day | 326 | 396 | 431 | 508 | 508 | 533 |

[a] 60 beds are bassinettes, not included in earlier years.

Source: Annual Reports, Lampang Provincial Hospital, 1974-1979.

The number of beds in the hospital has increased sharply (by 82%) since 1974, when the Lampang Project started. When the new inpatient wing is completed in late 1981, the number of beds will reach almost 750. However, despite the increase in bed capacity, the number of inpatients has increased only moderately. In 1974, the hospital was regularly filled beyond capacity; up to 1977, the average daily census

exceeded the beds available (sometimes requiring placement of extra beds in hallways and on verandas). In 1978 and 1979, as the number of beds increased, the proportion of beds filled declined, dropping to an average of only 68% for 1979. The decrease in the average proportion of beds filled is partly a result of the reallocation of beds to the various inpatient departments as the hospital expanded. This reallocation has led to some departments, such as the Department of Obstetrics and Gynecology, having considerable excess capacity, while other departments are overfilled.

The rapid expansion of bed capacity and the accompanying moderate increase in inpatients, which resulted in a decreased bed occupancy, may in turn have influenced an increase in the average length of stay, as shown in Table 2. In the early Project years, when the hospital was filled beyond capacity, the average length of stay was 4.3 days. But in 1978 and 1979, this increased to 5.2 and 4.8 days respectively.

Whereas the number of inpatients showed moderate expansion through the years of Project operations, the outpatient load increased sharply. Between 1974 and 1979, there was a 64% increase in outpatients. A notable increase in the number of outpatients served came in 1977, when the new, greatly expanded outpatient building opened, but it has tapered off slightly since then, possibly as a result of the changing patterns of health services utilization reported in Monograph 8.

## Geographic Origins of Hospital Users

As might be expected, utilization of the Provincial Hospital is generally heaviest by people who live nearby. By far the largest proportion of patients seen at the Provincial Hospital come from Muang District, where the Provincial Hospital is located. People in the districts far from, or not easily accessible to, the provincial capital appear to use the hospital very little. Data gathered in the Task Analysis Survey in the Provincial Hospital for one month in 1976 show the origins of hospital patients who came from Lampang Province, as summarized in Table 3.

Ninety-four percent of the patients sampled were outpatients and six percent were inpatients. Table 3 clearly shows that the great majority of patients came from Muang District, where the provincial capital and the Provincial Hospital are located. Over half of the patients came from Muang District, although the district contains less than 28% of the total provincial population. Thern, Mae Prik, Wang Neua, and Ngao Districts are the districts most distant from the Provincial Hospital, and patients from these districts appear to use the hospital minimally. With almost 24% of the total provincial population, these four districts account

Table 3

Percent Distribution of Provincial Hospital Patients Seen at Lampang Provincial Hospital by Patients' Home District, 1976

| District | District's Estimated % of Provincial Population (1976) | % of Lampang Patients Seen at Hospital (July, 1976) |
|---|---|---|
| | N = 643,260 | N = 7,190 |
| Muang | 27.4 | 54.0 |
| Koh Kha | 9.6 | 11.9 |
| Serm Ngam | 4.4 | 3.5 |
| Sob Prab | 3.9 | 3.3 |
| Thern | 8.3 | 1.3 |
| Mae Prik | 2.3 | 0.1 |
| Mae Moh | 3.4 | 2.9 |
| Hang Chat | 6.7 | 5.3 |
| Jae Hom | 10.8 | 5.2 |
| Wang Neua | 6.5 | 1.2 |
| Mae Tah | 9.8 | 9.9 |
| Ngao | 6.8 | 1.4 |
| Total | 99.9 [a] | 100.0 |

[a] Slightly under 100% due to rounding

Source: Project Task Analysis, 1976

During the Task Analysis survey carried out in the Provincial Hospital, a review of service records covering a nine-month period in 1975-1976 showed the distribution of services by type, as summarized in Table 4.

Although the major role of the Provincial Hospital is medical care, it has played an increasingly important role in health prevention and promotion, particularly for mothers and children. Table 4 indicates that pre-natal care, well-baby care (including immunizations), and family planning account for almost 20% of all outpatient services. Obstetrics (mostly deliveries) and family planning (mostly sterilizations) patients comprise over 30% of all inpatients.

A review of Provincial Hospital statistics during the period of Lampang Project implementation also reveals an expanding role in delivery care, pre-natal care and child care. Table 5 summarizes some selected service statistics. The number of deliveries and the number of pre- and post-natal care visits have in-

## Table 4

**Percent Distribution of Inpatient and Outpatient Service Contacts by Service Type, 1976**

### Part A. Outpatients

N = 106,218

| General | | Surgery and Orthopedics | |
|---|---|---|---|
| Service Category | % | Service Category | % |
| Medicine | 25.1 | First aid | 7.8 |
| Pre-natal care | 11.2 | Surgical exam | 6.9 |
| Gynocology | 11.0 | Orthopedic/physiotherapy exam | 5.8 |
| Pediatrics | 9.8 | Minor surgery | 0.9 |
| Family planning | 5.7 | | |
| Ear, eye, nose, throat | 5.1 | | |
| Dentistry | 4.5 | | |
| Accidents | 3.4 | | |
| Well-baby care | 2.9 | | |
| All services [a] | 78.7 | | 21.4 |

[a] Percent slightly over 100.0 due to rounding

Source: LHDP Task Analysis, 1976

### Part B. Inpatients

N = 9,916

| General | | Other | |
|---|---|---|---|
| Service Category | % | Service Category | % |
| Medicine | 24.8 | Obstetrics/family planning | 30.4 |
| Pediatrics | 14.0 | Surgery | 9.8 |
| Gynocology | 11.4 | Orthopedics/physiotherapy | 0.5 |
| Drug addiction | 5.3 | | |
| Accidents | 3.2 | | |
| Ear, eye, nose, throat | 0.6 | | |
| All services | 59.3 | | 40.7 |

Source: Task Analysis, Provincial Hospital, 1977

creased progressively, although fertility in Lampang has decreased throughout the period of Project implementation. The number of deliveries increased almost 25% between 1974 and 1979, and obstetric care visits increased almost 22%. Community Health Survey data suggest that about 30% to 35% of all deliveries in the province are performed at the Provincial Hospital. Pediatric care (mostly medical care) has likewise increased sharply in the years for which data are available, increasing over 150% between 1976 and 1979. Sterilization services in the hospital, on the other hand, decreased 37% in the five-year period, in part a result of broadened sterilization service availability in district hospitals and private clinics. The hospital's Community Health Department also began a mobile vasectomy program, serving large numbers of rural men in 1977-1979.

Table 5

Selected Service Statistics, Lampang Provincial Hospital 1974-1979

| Service Category | Annual Services | | | | | |
|---|---|---|---|---|---|---|
| | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
| Deliveries [a] | 3,972 | 4,481 | 4,422 | 4,665 | 4,895 | 4,951 |
| Obstetrics [b] | 22,350 | 27,039 | 32,361 | 39,740 | 28,328 | 27,191 |
| Pediatrics | NA | NA | 12,094 | 23,735 | 28,392 | 30,339 |
| Sterilizations | 867 | 858 | NA | 753 | 597 | 546 |
| Mobile vasectomies | - | - | - | 265 | 761 | 401 |

[a] Includes stillbirths and prenatal deaths.

[b] Most visits are for pre-natal care.

Source: Lampang Provincial Hospital Annual Reports, 1974-1979

## Patient Referrals

Direct patient referrals from a rural health facility to the Provincial Hospital are relatively infrequent, and those recorded generally come from district hospitals. However, the Task Analysis review of patient records in 1976 showed that well over half of the patients for the period studied were referred from Hang Chat District, the district where Project implementation occurred first (during 1974-1976). The referrals reported are only from districts which had a district hospital. The predominance of Hang Chat district referral was a result of the Project-stimulated linkage between the district and Provincial Hospital. This link was especially strengthened by the assignment of Provincial Hospital physicians to the district hospital on two-month rotations.

Table 6

Referrals to the Provincial Hospital
(9-month period in 1976)

| | District | | | | |
|---|---|---|---|---|---|
| | Jae Hom | Wang Neua | Thern | Hang Chat | Total |
| No referrals | 11 | 12 | 22 | 75 | 120 |
| % of total | 9.2 | 10.0 | 18.3 | 62.5 | 100.0 |
| Referrals/1000 population | 0.2 | 0.2 | 0.4 | 1.7 | 0.6 |

Source: Project Task Analysis, Provincial Hospital, 1977

## DISTRICT HOSPITALS, SUBDISTRICT HEALTH CENTERS, AND MIDWIFERY CENTERS

The Task Analysis survey is the major source of performance data concerned with district hospitals, subdistrict health centers, and midwifery centers. Baseline and follow-up surveys were conducted in a sample of facilities of each type in eight experimental and two control districts. The aim of the surveys was to gather performance data on each facility type both before Project modifications were operating and after they were introduced. In the study areas, a large number of facilities of each type were selected for observation (in some areas, all facilities were included). Then the Project investigators sent trained observers to observe the work of all health workers in each facility for a period of one or two weeks. In the baseline studies, the period was ten working days; the follow-up surveys covered five days.

Survey observers recorded the amount of time each health worker spent providing direct services, doing supportive work associated with services, doing field work, and time that was spent nonproductively. As workers provided services, the services were classified into predesignated categories, including medical care, maternal and child health care, family planning services, and nutrition services. Not only did the observers measure the amount of time spent by health workers in each type of service category, they also counted the number of service contacts.

After gathering initial baseline data in the $E_1$ and $C_1$ areas, a number of problems concerning definitions of terms and the questionable validity of the data were apparent. Therefore, the study was taken over by new staff at NIDA, who reorganized and conducted it more rigorously. Baseline data were subsequently

collected in the $E_2$ implementation area, and a second baseline survey was done in the $E_1$ area. At the end of the period of Project implementation in 1979, follow-up studies were also conducted in the same areas.

In reviewing all sets of data available, a number of problems appeared which could affect the comparison of baseline and follow-up data sets. These were:

(1) A difference in definitions and questionable validity of the baseline in the $E_1$ and $C_1$ areas. Also, in this pre-intervention data gathering, the number of observation hours was quite small and therefore subject to sampling error.

(2) The second-round baseline study carried out in the $C_1$ area occurred after some Project interventions had been introduced. The Provincial Health Office assigned wechakorn paraphysicians to health centers and midwifery centers in the $C_1$ control area in 1978, before the end of the control period. (Wechakorn had been placed in three of the five health centers sampled, and in both midwifery centers sampled). This, in effect, contaminated the control area before the follow-up Task Analysis study could be conducted. After follow-up data were collected and analyzed, the possible effects of Project interventions were apparent. The control area thus does not really represent the true pre-intervention situation.

To fulfill the need to compare pre-intervention and post-intervention performance data, a rearrangement of the data sets was made which resolves the problems described above, and still permits valid comparisons.

The problems with the $C_1$ control area data (both baseline and follow-up), and with the $E_1$ baseline set mentioned above, meant that the only satisfactory pre-intervention data set for Task Analysis was gathered in the seven $E_2$ districts. A large number of facilities and personnel were observed for a ten-day period, providing an adequate sample of performance data in the seven districts. The study was conducted before any interventions had been introduced into the $E_2$ area; therefore, it is the most representative baseline data set. The data sets which depict the post-intervention situation most broadly are the first follow-up study in the $E_1$ area and the follow-up studies $E_1$ and $E_2$ areas. Combining these has served to depict the post-intervention situation satisfactorily.

The data collection for the $E_2$ baseline area was done in May through July, 1977. The post-intervention data in the $E_1$ and $E_2$ areas was collected during a

period from October 1979 to January 1980. The baseline data set totals 4,200 personnel-hours of observation, of which 28.3% were at the district hospital, 46.7% at subdistrict health centers, and 25% at midwifery centers. There are a total of 8,190 personnel-hours of observation in the combined post-intervention data set, of which 42% took place at the district hospitals, 48% at health centers, and 10% at midwifery centers.

## Distribution of Working Time

Table 7 shows the proportionate distribution of total working time in district hospitals (Part A), subdistrict health centers (Part B), and midwifery centers (Part C), respectively, during the pre-intervention and post-intervention periods of observation.

### Table 7

Percent of Total Working Time Spent in Direct Service, Indirect Service, Field Work, and Nonproductive Activities, by Worker Category, Pre-and Post-Intervention

A. District Hospitals

| | Activity | Worker Category | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | All Workers | MD | Wecha-korn | Nurse | Nurse/ Aide | Mid-Wife | Sani-tarian | Other | Den-tist |
| Pre-Inter-vention | Direct Service | 10.4 | 9.6 | - | 7.1 | 0.5 | 10.5 | 4.2 | 18.2 | - |
| | Indirect Service | 20.9 | 47.8 | - | 10.7 | 15.0 | 19.9 | 15.4 | 27.0 | - |
| | Field Work | 0.2 | - | - | - | - | - | 1.1 | - | - |
| | Non-productive | 68.5 | 42.7 | - | 82.2 | 84.5 | 69.6 | 79.2 | 54.8 | - |
| | Total [a] | 100.0 | 100.1 | - | 100.0 | 100.0 | 100.0 | 99.9 | 100.0 | - |
| Post-Inter-vention | Direct Service | 14.4 | 30.0 | 26.4 | 11.9 | 17.7 | 9.2 | 7.8 | 8.4 | 11.7 |
| | Indirect Service | 28.4 | 25.1 | 37.4 | 34.6 | 16.3 | 26.8 | 36.0 | 34.2 | 22.8 |
| | Field Work | 4.4 | 1.5 | 5.9 | 3.7 | 0.7 | 7.2 | 30.8 | 1.4 | 2.4 |
| | Non-productive | 52.8 | 43.4 | 30.3 | 49.8 | 65.2 | 56.8 | 25.4 | 56.0 | 63.1 |
| | Total [a] | 100.0 | 100.0 | 100.0 | 100.0 | 99.9 | 100.0 | 100.0 | 100.0 | 100.0 |

B. Subdistrict Health Centers

| Activity | | Worker Category | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | All Workers | Wecha-korn | Nurse | Nurse Aide | Midwife | Sani-tarian | Other |
| Pre-Intervention | Direct Service | 9.1 | - | 10.1 | 13.9 | 11.6 | 6.7 | 2.2 |
| | Indirect Service | 29.8 | - | 19.4 | 51.1 | 32.7 | 29.9 | 5.8 |
| | Field Work | 13.7 | - | 35.4 | 6.9 | 13.8 | 15.3 | 5.8 |
| | Non-productive | 47.4 | - | 35.1 | 28.1 | 41.9 | 48.0 | 86.2 |
| | Total [a] | 100.0 | - | 100.0 | 100.0 | 100.0 | 99.9 | 100.0 |
| Post-Intervention | Direct Service | 13.5 | 14.5 | - | 9.0 | 12.9 | 17.2 | - |
| | Indirect Service | 34.7 | 32.0 | - | 29.9 | 34.0 | 48.0 | - |
| | Field Work | 5.9 | 6.3 | - | 1.0 | 6.3 | 9.9 | - |
| | Non-productive | 45.9 | 47.2 | - | 60.1 | 46.8 | 24.9 | - |
| | Total [a] | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | - |

C. Midwifery Centers

| Activity | | Worker Category |
|---|---|---|
| | | Midwife [b] |
| Pre-Intervention | Direct Service | 18.2 |
| | Indirect Service | 41.6 |
| | Field Work | 17.3 |
| | Nonproductive | 22.9 |
| | Total [a] | 100.0 |
| Post-Intervention | Direct Service | 13.3 |
| | Indirect Service | 50.7 |
| | Field Work | 8.9 |
| | Nonproductive | 27.1 |
| | Total [a] | 100.0 |

[a] Totals may be more or less than 100.0% due to rounding.
[b] There is normally only a single worker, the midwife.

The table shows the average proportion of total working time (based on a seven-hour workday) spent in direct service activities, in indirect services, in field work, and nonproductively by each type of worker in the different facilities. It shows the average for all worker categories in each facility type.

Several features of the distribution stand out. First, the proportion of total working time that all workers at each service level devote to direct service delivery was small. While district hospital physicians and wechakorn utilized about 30% of their time for direct service provision, all other categories of workers in all rural health facilities spent well under 20% of their time providing direct services.

In the pre-intervention observations, only about 10% of total working time (slightly less than one hour daily) was spent in direct service activities by workers at the district hospital and subdistrict health center level. At the midwifery center level, direct service activities accounted for slightly more than 18% of the working day.

In the post-intervention observations, the proportion of total working time devoted to direct service activity increased substantially in both the district hospital and subdistrict health centers, but decreased slightly in the midwifery centers. However, even with the general improvement occuring in the post-intervention period, at no facility level did the percentage of time devoted to direct services reach 20%.

If time spent in indirect services, which includes all of the supportive services (patient records, reports, preparation of drugs and materials), is combined with direct service time, the proportion of total work time devoted to the combined functions, when averaged for all workers at each facility type, showed an important increase between the pre- and post-intervention periods. At each facility level, the proportion of time spent in direct and indirect services by the individual worker categories varied during each observation period, and between the pre- and post-intervention periods. For example, the proportion of time that the district hospital physician spent in direct service activities changed from 9.6% to 30% in the post-intervention period. Likewise, the proportion of direct service time for nurses and nurse aides increased sharply in the post-intervention period. Also, in the post-intervention facilities, wechakorn paraphysicians contributed a large proportion of their time to direct service activities.

In the post-intervention survey of subdistrict health centers, the 50% increase in the proportion of time devoted to direct services was divided roughly equally among the wechakorn, midwives and sanitarians. At the midwifery centers, there was a 27% decrease in the amount of time spent in direct services (although the change in time spent in both direct and indirect services combined increased slightly).

The proportion of total work time devoted to field work, including such activities as home visits, health volunteer support, and sanitation, is a second feature of interest. In general, the proportion of time spent in field work at each service level was small. There was almost no time devoted to field work activities by personnel of the district hospital in the pre-intervention period, but this changed in the follow-up period, increasing over 400%. However, in the subdistrict health centers and midwifery centers, where time spent on field work might have been expected to increase, it appeared to decrease. In the pre-intervention period, a substantial proportion of total work time (between 10% and 20%) was spent in field work, but this decreased markedly in the post-intervention period. In subdistrict health centers, it decreased from 13.7% to 5.9% of total work time, a drop of 57%. At midwifery centers, the field work proportion dropped from 17.3% to 8.9% of total work time, a decrease of almost 49%.

The third finding which stands out in Table 7 is the proportion of time which was classified as nonproductive. This is time spent in the health facility idly awaiting patients or time spent outside of the facility for which no accounting was given. In the district hospital, although the proportion of total unproductive time decreased from 68.5% in the pre-intervention period to 52.8% in the follow-up period, the fact remains that on the average, over 50% of the work day for most health workers is not utilized productively. This may be, in part, a result of the large and increasing staff numbers at the district hospital in relation to the service load. At the subdistrict health centers, although the proportion of time classified as nonproductive decreased only slightly between the pre-intervention and post-intervention observations, it remained relatively high, at almost 46% of work time, despite a considerable increase in direct and indirect service time. The decrease in time devoted to field work appears to be the major factor accounting for the lack of change in nonproductive time.

In midwifery centers, the pattern was somewhat different. The proportion of nonproductive time, initially under 30%, increased between the pre- and post-intervention periods. However, midwives staffing midwifery centers appear more productively employed than many of their counterparts at subdistrict health centers and district hospitals.

## Categories of Direct Service Functions

The categories into which direct service functions were classified during the Task Analysis were: medical care, communicable disease control, family planning, maternal health, child health, sanitation, and nutrition. Each of these categories included a heterogeneous range of services. Medical care included treatment

of illness and injuries for all age groups. Maternal health included pre- and post-natal care and delivery care. Child care included child health examinations and immunizations, but did not include illness care for children, which was a part of the medical care category. Family planning included all types of user contacts, including sterilization, IUD, and DepoProvera injections, and oral contraceptive distribution. Sanitation services included water supply and sanitation activities, as well as sanitation education activities. Communicable disease control (CDC) services generally included immunizations for cholera, DPT, smallpox, and BCG. Because the number of sanitation contacts was small, it was combined with communicable disease contacts. So also were maternal and child health (MCH) contacts combined. Nutrition contacts observed during the Task Analysis survey appeared to be few, so little time of government health personnel appeared to be spent in nutrition related work. However, many health centers and midwifery centers in the sample facilities group had a Child Nutrition Center attached to them. The midwife in the health center or midwifery center has overall responsibility for the nutrition center, but it is normally run by one or two locally hired attendants. Child Nutrition Centers (CNC's) are the major continuing nutrition activity of the provincial health care delivery system, and serve an estimated 10% of the rural child population. However, the Task Analysis surveys did not include CNC's.

## Distribution of Direct Service Time

The distribution of observed direct service time between different service categories specified in the Task Analysis is summarized in Table 8.

The proportion of direct service time devoted to each of the five major service categories is shown for all workers combined, as well as for the individual workers in each facility level. Part A shows the time distribution for the district hospital; Part B shows the distribution for the subdistrict health center; and Part C is for midwifery centers.

The major portion of direct service time at the district hospital is devoted to medical care activities. Medical care remained the dominant activity at the district hospital, although the proportion of time devoted to medical care decreased from almost 85% to 73% between the pre-intervention and follow-up periods. The proportion of time devoted to communicable disease control and sanitation and maternal and child health activities increased sharply between the pre- and post-intervention observations. The proportion of time devoted to communicable disease control and sanitation increased almost ten-fold. The total time spent for maternal and child health work increased 120%.

Table 8

Percentage of Service Time Spent in Different Service Categories During Pre-Intervention and Post-Intervention Surveys

A. District Hospital

| Service Category | | % of Direct Service Time for Each Worker Category | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | All Workers | MD | Wechakorn | Nurse | Nurse Aide | Midwife | Sanitarian | Dental Aide | Other |
| Pre-Intervention | Medical Care | 84.9 | 100.0 | - | 39.2 | 100.0 | 73.6 | 94.3 | - | 98.0 |
| | CDC/Sanitation | 0.5 | - | - | 1.8 | - | 0.7 | - | - | 0.2 |
| | MCH | 5.4 | - | - | 19.0 | - | 9.3 | 1.7 | - | 1.4 |
| | FP | 9.0 | - | - | 39.2 | - | 15.9 | 4.0 | - | 0.5 |
| | Nutrition | 0.2 | - | - | 0.7 | - | 0.5 | - | - | - |
| | All Services [a] | 10.43 | 9.57 | - | 7.11 | 0.52 | 10.51 | 4.21 | - | 18.23 |
| Post-Intervention | Medical Care | 73.2 | 91.4 | 82.1 | 57.6 | 83.4 | 11.8 | 61.2 | 97.8 | 75.6 |
| | CDC/Sanitation | 4.6 | 2.2 | 4.7 | 4.6 | 4.2 | 8.8 | 25.0 | 0.2 | 1.4 |
| | MCH | 12.0 | 3.2 | 12.6 | 22.3 | 7.3 | 33.2 | 4.7 | 2.0 | 9.0 |
| | FP | 9.6 | 3.2 | 0.6 | 13.4 | 5.1 | 46.2 | 9.1 | - | 12.1 |
| | Nutrition | 0.6 | - | - | 2.1 | - | - | - | - | 1.8 |
| | All Services[a] | 14.42 | 30.01 | 26.45 | 11.97 | 17.73 | 9.19 | 7.80 | 11.73 | 8.41 |

B. Subdistrict Health Center

| Service Category | | % of Direct Service Time for Worker Category | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | All Workers | Wechakorn | Nurse | Nurse Aide | Midwife | Sanitarian | Other |
| Pre-Intervention | Medical Care | 55.0 | - | 52.0 | 53.7 | 49.7 | 71.3 | 36.9 |
| | CDC/Sanitation | 5.0 | - | 7.1 | 3.1 | 4.5 | 1.2 | 56.7 |
| | MCH | 14.8 | - | 19.8 | 15.3 | 20.0 | 1.9 | 4.1 |
| | FP | 23.9 | - | 21.1 | 27.9 | 24.8 | 22.4 | 2.3 |
| | Nutrition | 1.3 | - | - | - | 1.0 | 3.1 | - |
| | All Services [a] | 9.14 | - | 10.12 | 13.88 | 11.60 | 6.73 | 2.17 |
| Post-Intervention | Medical Care | 58.2 | 69.7 | - | 64.0 | 57.9 | 33.6 | - |
| | CDC/Sanitation | 19.7 | 10.7 | - | 4.0 | 11.2 | 55.8 | - |
| | MCH | 11.5 | 10.4 | - | 20.1 | 16.6 | 2.3 | - |
| | FP | 8.1 | 7.0 | - | 11.4 | 12.8 | 2.5 | - |
| | Nutrition | 2.5 | 2.2 | - | 0.4 | 1.5 | 5.8 | - |
| | All Services [a] | 13.53 | 14.54 | - | 9.00 | 12.93 | 17.24 | - |

C. Midwifery Center

| Service Category | | % of Direct Service Time for Work Category: Midwife |
|---|---|---|
| Pre-Intervention | Medical Care | 66.0 |
| | CDC/Sanitation | 1.4 |
| | MCH | 11.0 |
| | FP | 21.3 |
| | Nutrition | 0.3 |
| | All Services [a] | 18.21 |
| Post-Intervention | Medical Care | 55.3 |
| | CDC/Sanitation | 5.6 |
| | MCH | 21.8 |
| | FP | 14.3 |
| | Nutrition | 2.0 |
| | All Services [a] | 13.30 |

[a] All services refers to % of total working time devoted to direct services of all types.

With the addition of the wechakorn to the district hospital, there was also a shift in the distribution of activities among the workers there. Wechakorn spent the majority of their service time (over 80%) in medical care, as did the physician, nurses and nurse aides. In the baseline period the midwife and sanitarian had also spent a majority of direct service time in medical care; this changed dramatically in the follow-up period. The midwife's time devoted to maternal and child health and family planning increased greatly, apparently as a result of her taking responsibility for many MCH activities previously done by the nurses. The sanitarian health worker also focussed a much larger proportion of his work time on communicable disease and sanitation.

Although the proportion of time devoted to medical care at the subdistrict health centers was generally less than at the district hospitals, medical care still remained the major service activity at the subdistrict health center. In fact, the proportion of time devoted to medical care actually increased at this level between the pre- and post-intervention observations. Not only did the overall proportion of medical care time for all workers increase, but it increased for all of the individual workers except the sanitarian. Almost 70% of the wechakorn service time was devoted to medical care, and the proportion of time spent in medical care by midwives and nurse aides also increased. The proportion decreased

only for the sanitarian, who had devoted over 70% of his service time to medical care during the baseline period. Coupled with a decrease in time devoted to medical care was a concurrent sharp increase in communicable disease and sanitation activities for the sanitarian. Overall, there was a general decline in the proportion of time spent on maternal and child health, and a sharp drop (of more than 300%) in the portion of time spent in family planning activities. The latter result is of particular interest, mostly reflecting the sharing of routine oral contraceptive distribution with the health post volunteers.

In midwifery centers, the proportion of time spent providing medical care was roughly similar to that in the subdistrict health centers. However, although the medical care proportion decreased about 16% between the pre- and post-intervention observations, even then it remained above 50% of total service time. The proportion of time spent on maternal and child health doubled. Time spent on communicable disease control and sanitation activities greatly increased from a small base; but, as in the subdistrict health center, there was a sharp decrease in time devoted to family planning (about a 33% decline). The decrease in family planning time is most likely associated with the large-scale transfer of pill distribution activities to the health post volunteer. In all service facilities, a minimal amount of time was spent on nutrition activities. Although there was some improvement in the post-intervention period, at no facility did the proportion of time devoted to nutrition services reach 5%.

Service Contacts

The distribution of time devoted to different service categories provides only a partial picture of the pattern of health care delivery. Observations were made of health worker performance at various service levels, and the number of service contacts in each major service category was counted. (In the case of medical care contacts, actual service statistics for the year were used, as they were comparable to the Task Analysis service definition and were more complete for deriving an average week's activities than sample observations could provide.) Table 9 summarizes the average number of weekly contacts by service category in the district hospital, subdistrict health center, and midwifery center.

The distribution of service contacts by category of service roughly parallels the distribution of direct service time at each of the service facility levels. Medical care and family planning in both the pre-intervention and post-intervention observation periods comprise a majority of the service contacts. In the latter period they account for almost 80% of all service contacts at the district hospi-

## Table 9

Average Number of Service Contacts Per Week by Facility Type

| Service Category | Average Number of Contacts per Facility/Week | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | District Hospital | | | | Subdistrict Health Center | | | | Midwifery Center | | | |
| | Pre-Intervention | | Post-Intervention | | Pre-Intervention | | Post-Intervention | | Pre-Intervention | | Post-Intervention | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Medical Care | 116.7 | 43.4 | 130.7 | 58.8 | 28.9 | 39.5 | 40.4 | 56.5 | 20.3 | 42.5 | 21.2 | 47.5 |
| CDC/Sanitation | 19.0 | 7.1 | 21.0 | 9.5 | 22.6 | 30.9 | 9.0 | 12.6 | 3.7 | 7.8 | 3.3 | 7.4 |
| MCH | 44.5 | 16.5 | 23.7 | 10.7 | 7.1 | 9.7 | 8.5 | 11.9 | 7.2 | 15.1 | 7.7 | 17.3 |
| Family Planning | 85.0 | 31.6 | 46.0 | 20.7 | 12.1 | 16.5 | 12.6 | 17.6 | 16.5 | 34.6 | 11.1 | 24.9 |
| Nutrition | 4.0 | 1.5 | 0.8 | 0.4 | 2.5 | 3.4 | 1.0 | 1.4 | * | - | 1.3 | 2.9 |
| All contacts | 269.2 | 100.0 | 222.2 | 100.0 | 73.2 | 100.0 | 71.5 | 100.0 | 47.7 | 100.0 | 44.6 | 100.0 |

* Less than 0.05. Source: Project Task Analysis

tal, 63% of contacts at the subdistrict health centers, and over 72% of contacts at the midwifery centers. Medical care contacts in the district hospital and subdistrict health center increased sharply, but they increased only slightly at midwifery centers. The average number of family planning contacts decreased sharply at the district hospital and midwifery centers, and remained relatively unchanged at the subdistrict health centers. Another important trend apparent in Table 9 is an overall decrease in total service contacts per week between the baseline and follow-up observations: a decrease of 17.4% at district hospitals; 2.3% at subdistrict health centers; and 6.5% at midwifery centers. This may, at first, appear to conflict with the apparent trends in service statistics totals (at least in the $E_1$ and $E_2$ districts) that suggest a broad increase in both medical care and family planning service contacts. Since these two categories normally constitute 60% to 80% of all service contacts in rural areas, a general increase in the average weekly service output at rural facilities might be expected. In fact, the apparent increase in average weekly medical care service contacts at each facility level corresponds closely with service statistics, which show an increase in medical care contacts at each level.

On the other hand, family planning service statistics show an increase when they include the service contacts of health post volunteers. However, volunteer family planning services would not appear in Task Analysis data generated by observations at rural health facilities. Therefore the Task Analysis data does not represent the total number of rural family planning contacts served by government-supported providers. The decrease in the average family planning contacts of government-supported providers is probably due to their sharing of responsibility for distribution of oral contraceptives with the volunteers.

In the final analysis, there may be a slight net decrease in the average number of services provided at each service unit. This is partially a result of the increase in the number of service facilities. For example, the number of district hospitals has doubled; the number of subdistrict health centers has also doubled. The total number of health facilities has increased by more than 50% between the pre- and post-intervention periods. The other factor most likely responsible for the relative lack of change in average service output at each facility is the sharing of services with community health volunteers. This is particularly apparent for family planning.

Despite whatever new appeal the rural health facilities may have stimulated through improved, integrated health services, coupled with the presence of community volunteers as motivators, the net output per center has decreased slightly.

The data presented in the preceding tables, together with utilization results presented in Monograph 8, suggest that rural health facilities are probably adequately meeting the population's need for medical care, for family planning services, and for some maternal services, such as delivery care. However, given the much smaller proportion of time devoted to direct services concerned with nutrition, sanitation, and communicable disease control, along with the small portion of time spent in field work, it seems clear that these important aspects of community health programs have not received the emphasis they deserve. Although the activity in Child Nutrition Centers is not reflected in the Task Analysis data, it still appears that the general level of community nutrition activity is quite low in relation to the magnitude of the problem. The lack of change in pre-school child nutrition status may be one indicator of the need for broader-based community nutrition activities that will focus on the needs of undernourished children.

The major emphasis at all rural health facility levels is still on medical care, which, with family planning services, accounts for the great majority of both health worker service time and service contacts. The addition of the wechakorn paraphysician at each service level has strengthened this emphasis on medical care, and the data reflect what the wechakorn have themselves expressed: medical care is their most important activity. Forty to fifty percent of available working time is not used productively at every facility level except at midwifery centers (where 25% of work time is spent unproductively). Health workers, or any other workers, cannot be expected to be fully engaged 100% of the working hours. However, the large proportion of working time that is slack time means there is still considerable time available that could be devoted to activities currently underemphasized: community-based nutrition, immunizations, water supply and sanitation. Emphasis on these programs would improve the balance of services at each facility level, and it would strengthen the services that are required to serve apparent unmet needs in the community.

## COMMUNITY HEALTH VOLUNTEERS

The training, role and performance of community health volunteers has been described in detail in Monograph 2, Volume II. However, it is important to review the volunteers' contribution to the rural health care delivery network, and to integrate data on their performance with that of other workers and facilities to gain an overview of changes in the performance of the total system. The presence of the village health volunteers has several possible effects on the pattern of rural health care delivery. (1) Living among and closely resembling their fellow villagers, volunteers add a new, independent component of health care service not

previously available in the system. They can also contribute to increased utilization of other government rural health facilities by referral and by increasing their peers' awareness of available services, (2) In some cases, the volunteers assume a portion of services previously provided by other health facilities (e.g., family planning), which might decrease the service output at these facilities as such services are shifted to volunteers.

The major routine activities of health post volunteers are medical care for minor ailments and oral contraceptive distribution. Data compiled from volunteer reports, along with their records of referrals, provide an adequate picture of these activities. Community health volunteers, particularly the health post volunteers, have made a large contribution to increased medical care and family planning services. Reports on their activities show numerous medical care and oral contraceptive distribution contacts, which grew steadily to comprise a large and significant portion of all government rural health service contacts in the final year of Project implementation. The content of volunteer service contacts is not generally comparable with contacts at rural health service facilities. The volunteers' training in first aid and simple medical care is rudimentary, and the household drugs dispensed are generally for symptomatic treatment. Nevertheless, they may care for many villagers who might have gone to a health center or other source unnecessarily, or might have treated themselves. On the other hand, volunteer distribution of oral contraceptives (only follow-up cycles) is a simple task which is comparable to the same service provided at other facilities. Thus, a simple but important service, normally provided by government rural health facilities, has been transferred in part to health post volunteers. Their sharing in oral contraceptive distribution makes using the pill more convenient for village women and may contribute to continuation of use.

Health post volunteer medical care and family planning service data are summarized in Table 10.

Table 10 shows the average annual medical care contacts (including the proportion referred) and family planning contacts for each health post volunteer, as well as the weekly contacts of each type. The table first separates the volunteer performance data by implementation area, and finally includes all districts where volunteers were working and reporting in 1979.

To integrate the performance of individual volunteers with other sets of performance data from rural health facilities, it was necessary to convert the volunteer performance data to a measure of total volunteer services associated with each rural health facility.

Table 10

HPV Medical Care (MC) and Family Planning (FP) Contacts,[a] 1979

| Area | No. HPV's | Annual No. HPV Medical Care Contacts | Annual No. HPV FP contacts | Av.No. Medical Care Contacts/HPV/Yr. (% of these referred) | Av. FP Contacts/ HPV/ Year | Av/Wk | |
|---|---|---|---|---|---|---|---|
| | | | | | | MC | FP |
| $E_1$ | 75 | 16,283 | 12,489 | 217.1 (2.3) | 166.5 | 4.2 | 3.2 |
| $E_2$[b] | 381 | 74,528 | 46,220 | 195.6 (6.2) | 121.3 | 3.8 | 2.3 |
| $E_1 + E_2$ | 456 | 90,811 | 58,709 | 199.1 (3.9) | 128.7 | 3.8 | 2.5 |
| All Districts[c] | 663 | 140,293 | 91,310 | 211.6 (2.6) | 137.7 | 4.1 | 2.6 |

[a] All data have been adjusted for underreporting.

[b] No HPV data available for 1979 in Serm Ngam (36 V's), one district of $E_2$. This district has therefore been deleted from the calculations, as has the control district, Mae Tah (124 V's).

[c] Average figures differ slightly from those in Monograph 2 because data are adjusted for underreporting, and Ngao District, served by Community-Based Family Planning volunteers, is included in average.

Rather than express volunteer performance data on an individual basis, the service data are expressed as an average number of volunteer service contacts associated with each rural health facility. For 1979, the total annual health post volunteer medical care and family planning contacts were divided by the number of government rural health facilities in the areas where volunteers worked. This, of course, assumes that on the average, the number of volunteer service contacts is roughly the same for each district hospital, subdistrict health center, and midwifery center. Table 11 summarizes this conversion.

Table 11

HPV Medical Care and Family Planning Contacts per Health Facility, 1979[a]

| Area | No. HPV's | Annual No. HPV Medical Care Contacts | Annual No. HPV FP Contacts | No. of Government Facilities[b] | HPV MC Contacts/ Facility/Wk | HPV FP Contacts/ Facility/Wk |
|---|---|---|---|---|---|---|
| $E_1$ | 75 | 16,283 | 12,489 | 10 | 31.3 | 24.0 |
| $E_2$[c] | 381 | 74,528 | 46,220 | 59 | 24.3 | 15.1 |
| $E_1 + E_2$ | 456 | 90,811 | 58,709 | 69 | 25.3 | 16.4 |
| All Districts[d] (with V's ) | 663 | 140,293 | 91,310 | 96 | 28.1 | 18.3 |

[a] All data have been adjusted for underreporting.

[b] District Hospitals, Subdistrict Health Centers, Midwifery Centers (excluding those in Serm Ngam and Mae Tah).

[c] No HPV data available for 1979 in Serm Ngam (36 V's), one district of $E_2$. This district has therefore been deleted from the calculations, as has Mae Tah (124 V's).

[d] Average figures differ slightly from those in Monograph 2 because data are adjusted for underreporting and Ngao District is included in average here.

## CHILD NUTRITION CENTER (CNC) CONTACTS

Estimating Child Nutrition Center contacts associated with each rural health facility required several calculations. The Task Analysis did not show many nutrition contacts at the health facilities surveyed. This is not surprising as few children are brought to rural health facilities specifically for nutrition care. The main thrust of nutrition activity in the provincial health delivery system is the Child Nutrition Center program, which has grown considerably during the period of Project implementation. Between 1974 and 1979, the number of centers grew from 11 to 93 (increasing to over 150 by 1981). In 1979, there were 3,573 preschool children (about 6.8% of all children in this age group) enrolled in these centers. Although many of the CNC's are attached to district hospitals, subdistrict health centers, and midwifery centers, their activities were not observed during the Task Analysis, leading to an underreporting of nutrition activities. Moreover, since all supplies for CNC's are distributed through rural health facilities, the costs of nutrition work, but not the services, are apparent. This has led to the unusually high suggested costs for nutrition contacts.

Data on Child Nutrition Center contacts need to be incorporated into the analysis of services and costs. Complete data on the number and attendance at Child Nutrition Centers are only available for 1979. However, the number of CNC's was very small in the pre-intervention period, and thus would have affected nutrition service costs only slightly. CNC service contacts associated with each health facility have been estimated for only the post-intervention period.

Although there were 93 CNC's in late 1979, several had only been established during that year and had not been in operation a full twelve months. As a result, there was an equivalent of 76.18 CNC facility-years of service for the 93 centers. Each center had an average of 38.4 children attending, and provincial health staff estimated that average attendance was about two-thirds of this number daily. This means that, on the average, there were 25.73 daily child nutrition contacts in each CNC.[a]

The total number of children is relatively small, but since the contacts are repetitive, the overall service output seems more substantial than it really is. These data must therefore be used with caution.

## INTEGRATION OF SERVICE DATA

As village-based community health volunteers and Child Nutrition Centers have made important contributions to overall performance of the rural health care delivery system, it is important to combine their service data with that from other rural health facilities and from the Provincial Hospital. This ultimately permits a review of how the pattern of service delivery has changed, and of the shift in the proportionate distribution of services among the system's delivery components. It is also important to integrate the data sets as a major step in calculating costs of services at each facility level.

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[a] To compute total annual Child Nutrition Center contacts, the calculations are as follows:

| | |
|---|---|
| Average CNC contacts/day | 25.73 |
| No.days/year CNC is open | x 260 |
| Average annual contacts/facility | 6,689.8 |
| No. CNC facility-years for 1979 | x 76.18 |
| Total CNC contacts per year | 509,629 |
| No. rural health facilities | ÷ 107 |
| Average annual CNC contacts/rural health facility | 4,763 (or 91.60 per week) |

Table 12 shows the magnitude of health post volunteer and Child Nutrition Center service contacts in relation to other service components. These contacts, as explained in the previous section, have been estimated on a per facility basis: the average number of contacts that all volunteers and CNC's linked to each facility would generate in a week's time. They are thus comparable with data for the other facilities. In addition, the average number of total HPV service contacts has been added to average total service contacts at each service level. This produces an estimate of total service contacts (official, CNC, and volunteer combined) associated with each service level for the post-intervention period, as shown in Table 12. The table shows that after adding the volunteer contribution, the total contacts associated with the district hospital have changed very little between pre- and post-intervention observations. The addition of the volunteer service contacts to subdistrict health centers and midwifery significantly increased the service output at each of these levels in the post-intervention period. Further addition of the CNC contacts greatly increases service output at each level.

Table 12

Estimated Number of Services Per Week, by Facility Level Including Health Volunteers

| | Pre- and Post-Intervention Periods | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Service Contacts by Facility | | | | | | | |
| | District Hospital | | Subdistrict Health Center | | Midwifery Center | | HPV's | CNC's |
| | Pre-Int. | Post-Int. | Pre-Int. | Post-Int. | Pre-Int. | Post-Int. | Pre-Int. | Post-Int. |
| Medical Care | 116.7 | 130.7 | 28.9 | 40.4 | 20.3 | 21.2 | 28.1 | - |
| CDC/Sanitation | 19.0 | 21.0 | 22.6 | 9.0 | 3.7 | 3.3 | - | - |
| MCH | 44.5 | 23.7 | 7.1 | 8.5 | 7.2 | 7.7 | - | - |
| FP | 85.0 | 46.0 | 12.1 | 12.6 | 16.5 | 11.1 | 18.3 | - |
| Nutrition | 4.0 | 0.8 | 2.5 | 1.0 | -a- | 1.3 | - | 91.6 |
| Total | 269.2 | 222.2 | 73.2 | 71.5 | 47.7 | 44.6 | 45.4[b] | 91.6 |
| Av. HPV contacts/ facility | - | +45.4 | - | +45.4 | - | +45.4 | | |
| Adjusted Total | 269.2 | 267.5 | 73.2 | 116.9 | 47.7 | 90.0 | | |
| Av. CNC contacts/ facility | NA | +91.6 | NA | +91.6 | NA | +91.6 | | |
| Adjusted Total contacts/facility | 269.2 | 359.2 | 73.2 | 208.5 | 47.7 | 181.6 | | |

-a- Less than 0.05. [b] Smaller than total because of a few combined visits.

Table 13 further integrates the sets of service data available, providing an overview of total service output by the different components of the provincial health care delivery system. Provincial Hospital data, derived from annual service statistics, are added to the data already presented in Table 11. An estimate of the total service output of the provincial government-supported health care system can be made from the data available. However, making these estimates requires several assumptions. The service outputs for district hospitals, subdistrict health centers, and midwifery centers are based on Task Analysis sample data (one or two weeks' of observations), and it must be assumed that these data represent an average week for any facility of each type. The number of facilities sampled was extensive

Table 13

Estimated Total Service Contacts for Government Provincial Health Care System, Pre- and Post-Intervention

| Service Facility and Provider | Average Contacts/Week | | No. Rural Facilities | | Estimated Total Weekly Contacts | |
|---|---|---|---|---|---|---|
| | Pre-Int. | Post-Int. | Pre-Int. (est.)[a] | Post-Int. | Pre-Int. | Post-Int. |
| District Hospital | 269.2 | 222.2 | 4 | 7 | 1,076.8 | 1,555.4 |
| Subdistrict HC | 73.2 | 71.5 | 46 | 70 | 3,367.2 | 5,005.0 |
| Midwifery Center | 47.7 | 44.6 | 37 | 30 | 1,764.9 | 1,338.0 |
| HPV | - | 45.4[b] | - | 107 | - | 4,857.8 |
| Child Nutrition Center | NA | 91.6 | NA | 107 | NA | 9,801.2 |
| All Rural | - | - | - | - | 6,208.9 | 22,557.4 |
| Provincial Hospital[c] | 3,565.4 | 3,740.9 | 1 | 1 | 3,565.4 | 3,740.9 |
| Total/Week | | | | | 9,774.3 | 26,298.3 |
| Total/Year | | | | | 508,263.6 | 1,367,511.6 |

[a] 1977 is the pre-intervention year. [b] Average of all HPV contacts ÷ 96 facilities - all facilities except in Mae Tah (no HPV's) and Serm Ngam (no HPV reports).
[c] Only Outpatients.

and widespread (8 of 12 districts) and the sample facilities can be safely judged representative. However, the period of observation was relatively short (5 or 10 days only) and it must be assumed this represents a typical week's performance through the year. Medical care contacts were estimated using actual service statistics rather than Task Analysis survey data.

Another major assumption is that the estimated number of health volunteer service contacts linked to each service facility is uniform. This, in reality, is not the case; the total volunteer service output is based on actual service reports (adjusted for underreporting) and the method[a] of allocating them by facility is arbitrarily based on the total facilities available in the pre- and post-intervention periods.

It is clear that there has been a major increase in overall output of the government-supported provincial health care delivery system, as well as for each of its components. There has been a substantial increase in the output of rural health service facilities, and the Provincial Hospital's proportion of total services has decreased proportionately. A large part of the increase in service output of rural health facilities is the result of two factors:

(1) The number of facilities increased between the pre- and post-intervention periods; and

(2) The addition of community health volunteer and Child Nutrition Center services greatly expanded the output.

There has been a broad increase in the total services provided by the conventional MOPH rural health care facilities. Another component of expanded service output has been the community health volunteer and Child Nutrition Center activities, which have supplemented the services of other facilities. At the same time, Com-

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[a] To calculate total weekly service outputs in the pre- and post-intervention periods shown in Table 13, the weekly output per facility was simply multiplied by the number of facilities of each type available. For health post volunteers, who were only working in the post-intervention period, the average number of service contacts associated with a given facility was multiplied by the total facilities in the province to estimate their overall contribution. This was also done for CNC contacts. Adding up the columns for all service facilities provides a comparative estimate for the pre- and post-intervention periods for rural health facilities. Combining the weekly outpatient contacts at the Provincial Hospital gives an estimate of the total service contacts provided by the official health care delivery system before and after Project operations. These were then simply multiplied by 52 to derive annual estimates of total service output. (Because pre-intervention Task Analysis data on district hospitals, subdistrict health centers and midwifery centers were collected in 1977, 1977 data for the Provincial Hospital have also been used for comparison. Likewise, the number of available facilities of each type in the pre-intervention situation is for 1977. In many ways, 1977 was not a pre-intervention year, as there were more facilities and a much larger number of services provided by the Provincial Hospital than was the case in 1974, before the Project began. In effect, choosing 1977 makes the pre-intervention service output considerably larger than it actually would have been in 1974; but it is still useful for comparative purposes.)

munity Health Survey data indicate a sharp increase in the population's contact with the delivery system through service utilization. Coverage of the target populations with special needs -- women of reproductive age and preschool children -- has also increased, though not quite to the extent planned. Therefore, in terms of the overall service output of the delivery system, and in terms of its ability to reach the groups given special emphasis, there has been considerable progress during the Project years. Figures 2 and 3 graphically summarize these changes.

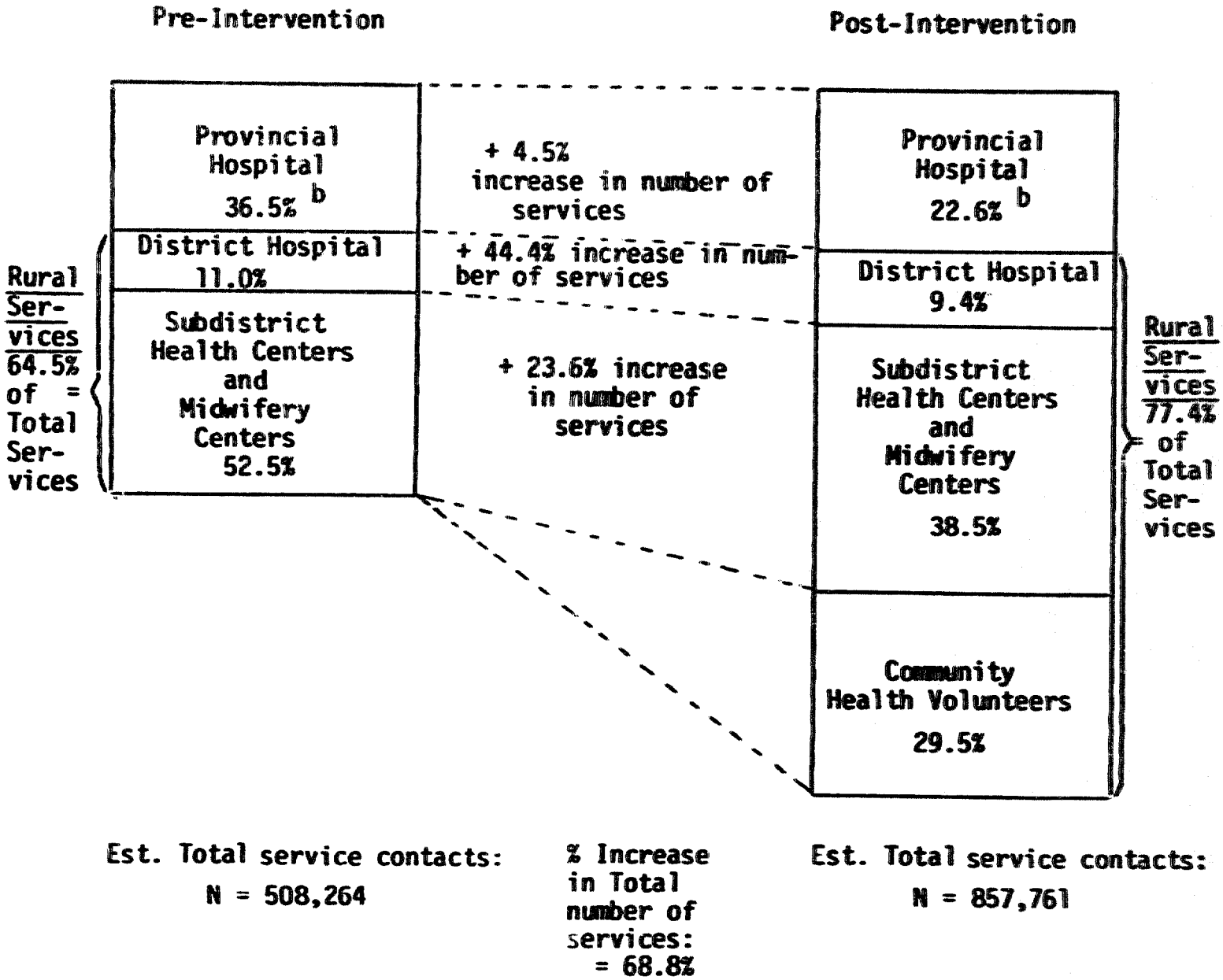
Figure 2 roughly outlines the change in service output by the various components -- both new and old -- of the health delivery system. The estimated number of total service contacts has increased almost 69%. The large expansion of rural-level health service capacity, including the village health volunteers, should be noted. Figure 3 shows the change in overall output by type of service provided, with the largest increases coming in medical care, family planning and maternal and child health services.

Medical care and family planning contacts constitute two-thirds to three-quarters of all user contacts with the government health delivery system. Because most of these contacts take place in a health facility or a volunteer's home, where recording is convenient, they tend to be better documented than other types of service contacts. Since they make up the bulk of services, and to a great extent parallel the extent of the population's interaction with the government-supported health care system, they can be used to describe the shift in the pattern of service delivery and utilization.

Figures 2 and 3 also show the distribution of health services provided by the government-supported delivery system. However, they by no means reflect the proportionate distribution of all services between government- and nongovernment-supported facilities.

Figure 2

Change in Annual Service Output[a] by Service Level in Pre-Intervention and Post-Intervention Years

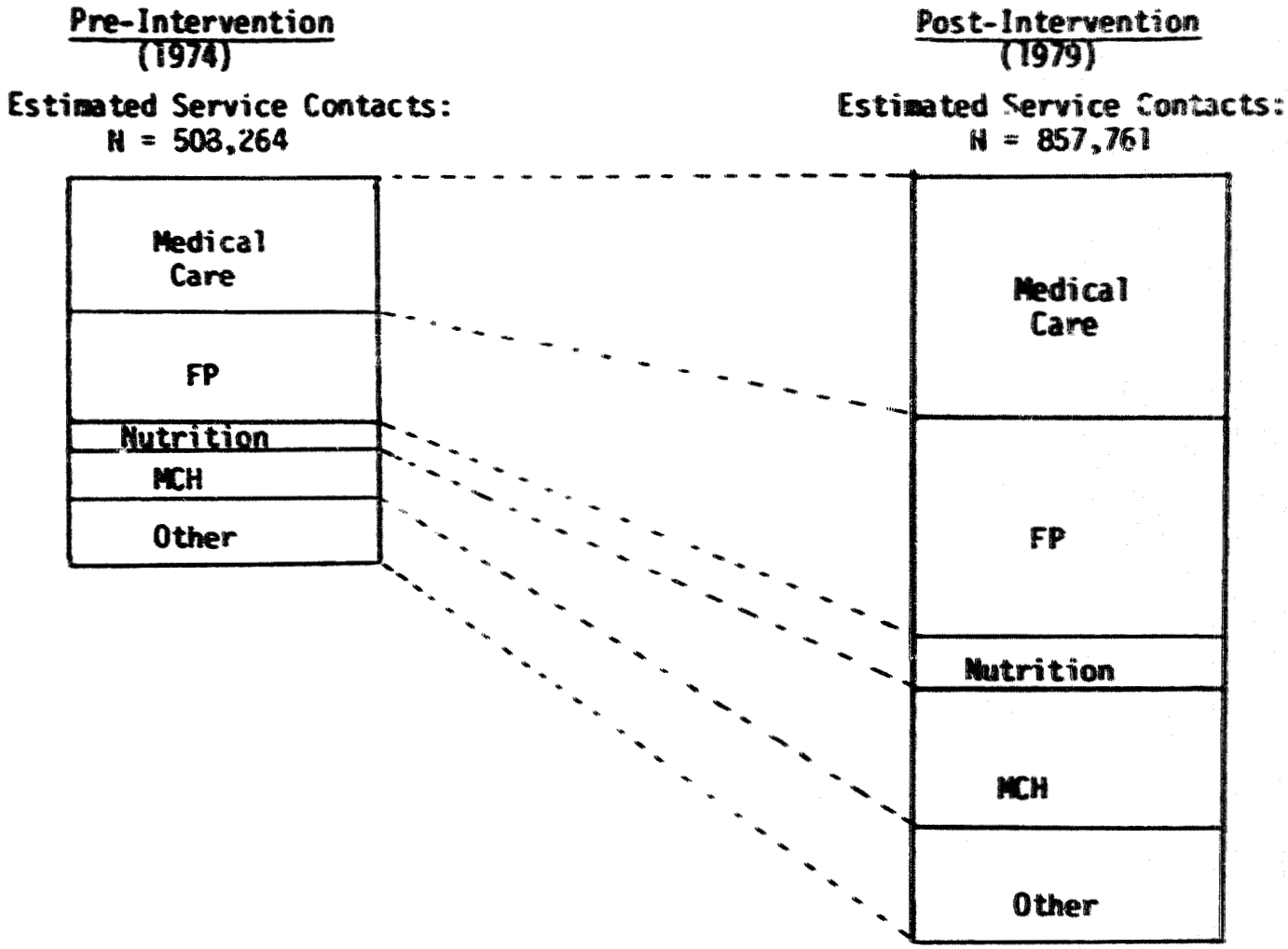



[a] Does not include CNC contacts, as complete Child Nutrition Center data are not available for the pre-intervention period.

[b] Refers to that facility's % of total services; e.g., the Provincial Hospital provided 36.5% of all services in the pre-intervention period. But although the number of hospital services increased 4.5%, the Provincial Hospital's % of total services in the post-intervention period dropped to 22.6% because of the larger increase in service output by other facilities and providers.

Figure 3

Change in Distribution of Service Contacts by Category of Service from Pre-Intervention to Post-Intervention Years



# CHAPTER 3

# HEALTH CARE COSTS

General national-level health cost data will be presented, before begining a discussion of the methodologies and data used in analyzing costs in the Lampang health care delivery system. These data provide a context for the more specific cost information collected for the Lampang system.

## NATIONAL HEALTH CARE COSTS

The government is the major provider of organized health care service in Thailand, directly or indirectly controlling a majority of the hospitals and health centers, and employing the great majority of physicians, nurses, midwives, sanitarians and other health professionals. The Ministry of Public Health is the largest single health care provider, although a number of other ministries and government agencies also have substantial health care roles. The budget of the Ministry of Public Health, as in many countries, has seldom reached 5% of the total government budget. Total government expenditures on health care, as far as they can be accounted for, have in recent years averaged slightly over 6% of the national budget. Table 14 summarizes Thai government health expenditures in the period 1975 to 1979.

Although government expenditures on health increased steadily during the five-year period, the proportion of the total government budget spent on health did not. From a peak of 7% of the total government budget in 1977, government health care expenditures have remained at slightly more than 4% for the Ministry of Public Health (the proportion has dropped below 4% in 1981), and 6% for total government health care expenditures in recent years. When per capita expenditures are calculated, there appears to be a significant increase during the five-year period. However, a large part of the increase would be influenced by inflation, which has run 9% to 20% per annum during this period.

Table 14

Thai Government Health Expenditures, 1975-1979
(20 baht = 1 US dollar)

| Source | Fiscal Year (millions of baht) | | | | |
|---|---|---|---|---|---|
| | 1975 | 1976 | 1977 | 1978 | 1979 |
| Ministry of Public Health | 1,547.4 | 2,725.3 | 3,520.6 | 3,405.8 | 3,976.9 |
| Other government health expenditures | 2,415.1 | 3,889.0 | 4,840.2 | 4,916.3 | 5,740.5 |
| Total government expenditures on health | 50,500.0 | 62,650.0 | 68,790.0 | 81,000.0 | 92,000.0 |
| Total government health expenditures as % of government expenditures | 4.78% | 6.21% | 7.04% | 6.07% | 6.24% |
| Total MOPH expenditures as % of total government expenditures | 3.06% | 4.35% | 5.12% | 4.20% | 4.32% |
| Estimated per capita expenditure by MOPH | 36.96 | - | - | - | 86.45 |
| Estimated per capita health expenditure by government | 57.69 | - | - | - | 124.79 |

Source: Health Planning Division, Ministry of Public Health

It is estimated that private expenditures on health care are about twice those of the government. This suggests that in 1979 the average private per capita health expenditure would have been about 250 baht annually. Private expenditure would be distributed among the many pharmacies and druggists and the wide array of modern and traditional facilities and practitioners available.

The Ministry of Public Health has a broad range of responsibilities, including all provincial and district hospitals, many specialized hospitals, rural health centers, health training, rural water supply and sanitation, communicable disease control, and many other technical functions -- curative, preventive and supportive. The accounting system of the Ministry does not easily lend itself to identifying budgetary expenditures by program, but estimates of the proportionate distribution by broad program areas have been made. Table 15 presents an estimated distribution of the 1979 MOPH budget.

Table 15

Percent Distribution of MOPH Budget
by Type of Service Function
1979

(20 baht = 1 US dollar)

| Activity/Function | % |
|---|---|
| General Administration | 1.99 |
| Medical care services | 56.65 |
| Disease prevention/control | 18.94 |
| Health promotion | 15.79 |
| Health training | 4.40 |
| Laboratory | 0.81 |
| Food/Drug control | 0.74 |
| Other Support | 0.68 |
| Total MOPH budget: ฿3,976,909,300. | 100.00 |

Source: Mills, p.7

The major portion of the budget - almost 57% - went to medical care services, and almost 35% went to public health activities.

The brief summary above provides a general overview, and is of interest in gauging the scope and emphasis of national investments in health care.

## PROVINCIAL HEALTH CARE COST

Reflecting the trends in national-level investment, provincial-level government expenditures on health in Lampang have increased sharply every year during the period of Lampang Project operations. Table 16 summarizes the Provincial Hospital and Provincial Health Office expenditures for each year from 1975 to 1979.

Table 16

Annual Provincial Health and Provincial Hospital Expenditures[a]

FY 1975-1979 (20 baht = 1 US dollar)

| Source | Expenditure in baht | | | | |
|---|---|---|---|---|---|
| | 1975 | 1976 | 1977 | 1978 | 1979 |
| Provincial Health Office | 7,382,885 | 10,435,966 | 11,811,030 | 13,616,732 | 15,889,239 |
| Provincial Hospital | 14,490,700 | 27,806,861 | 32,131,505 | 46,652,787 | 70,399,337 |
| Total | 21,873,585 | 38,242,827 | 43,942,535 | 50,269,519 | 86,288,576 |
| Estimated per capita expenditures | 34.36 | 59.48 | 68.31 | 92.92 | 132.24 |
| Estimated per capita expenditures (excluding capital construction costs) | 28.78 | 39.20 | 45.21 | 62.07 | 82.91 |

Source: Provincial Health Office and Provincial Hospital Financial records.

[a] Including capital costs, and combining government budget and income from service fees.

The table includes both the budget provided by the Ministry of Public Health and the income generated by fees for services (which in the provincial hospital is more than 20% of the total budget). By far the largest proportion of the health budget goes to the Provincial Hospital. Almost 82% of the total budget went to the Provincial Hospital in 1979. The hospital's budget has grown dramatically since 1975, as has its proportion of the total provincial health budget.

Given the major increase in health expenditures, coupled with relatively moderate population growth since 1975, provincial per capita health expenditures have increased sharply. The per capita health expenditure at the provincial level has increased about 400% in the five-year period reviewed. Subtracting the effects of inflation (averaging about 12% annually) would still leave a substantial increase in per capita health expenditures. However, a large segment of provincial health expenditures in recent years has gone towards construction of new facilities, in particular the expansion of the provincial hospital. Over one-

third of the total provincial expenditures for the five-year period in Table 16 was for construction. If the construction expenditures are separated from total health expenditures, the per capita expenditure is considerably reduced. Nevertheless, despite the high rate of inflation there appears to have been a large net absolute increase in per capita expenditures on health.

## SOURCE OF PROJECT COST DATA

Overall provincial-level health expenditures do not provide a detailed picture of costs in the different delivery system components.

Cost data were drawn from the financial records of each facility surveyed at the same time Task Analysis was done. However, in some facilities, financial records were incomplete and were therefore unusable. As a result, the number of facilities for which cost data were available was slightly less than the number in which performance data were collected. The number of facilities from which cost data were collected were:

| | Pre-Intervention | Post-Intervention |
|---|---|---|
| No. District hospitals | 1 | 4 |
| No. Subdistrict health centers | 12 | 33 |
| No. Midwifery centers | 12 | 18 |

Annual costs of each facility were compiled (for the year previous to the survey), and included both the normal government budget and revenues generated by patient payments. Costs were allocated to four major categories: capital expenditures, maintenance costs, costs of expendable items, and personnel costs.

Capital Expenditures for building, equipment and vehicles were allocated annually based on depreciation rates varying by item and estimated lifetime. The rates used were as follows:

| Capital Item | Rate of Depreciation (% of 1977 market value) | Estimated Lifetime (years) |
|---|---|---|
| Buildings | 3.3 | 30 |
| Durable appliances | 6.5 | 15 |
| Nondurable appliances | 15.0 | 6 to 7 |
| Medical equipment | 5.0 | 20 |
| Motorcycles | 12.5 | 8 |
| Bicycles | 10.0 | 10 |

Capital values for 1977 were used in both the pre-intervention and post-intervention calculations.

Maintenance costs are those costs incurred in maintaining buildings, premises, and equipment. Some of these expenses were readily available from financial records, but others, such as building maintenance, were not. Based on recommendations from Thai cost analysts, building maintenance costs were estimated at 1% of annual capital expenses.

Costs of expendable items, such as drugs, supplies, fuel and other consumables, were derived directly from vouchers and receipts at each facility. However, inventory control and documentation were uneven at different facilities, and some expendable costs may not have appeared in the records. Therefore, data on expendables may be slightly under-represented.

Personnel costs, which include base salary costs and all types of fringe benefits, such as incentive pay for physicians, overtime allowances, and school and health care allowances for dependents, were taken from each facility's personnel records.

Allocating Costs to Service Functions

The allocation of each category of expenditures to the six service functions -- medical care (MC), maternal and child health (MCH), family planning (FP), communicable disease control (CDC), sanitation (S), and nutrition (N) -- was based on two sources of data obtained from the earlier Task Analysis: the proportion of total service contacts for each service function, and the percentages of total service time devoted to each service function. For expenditures such as capital, maintenance and expendable items, the number of service contacts was considered the most relevant allocating factor.

For example, daily depreciation of floor space depends on the number of contacts rather than the total service time in that day. Therefore, allocation of expenditures for capital, maintenance and expendable items was made in direct proportion to the service contact percentages for each service category.

The total personnel costs for all worker categories at each facility studied were extracted from official records at the district health office or provincial health office. These costs for each type of personnel were then allocated to each type of service category according to the proportion of direct service time that each worker spent in the various service categories.

Table 17 shows the average annual costs for the major component facilities in the provincial health care delivery system: the provincial hospital, district hospitals, subdistrict health centers, and midwifery centers.

Table 17

Average Annual Costs for Component Facilities of the Lampang Provincial Health Care Delivery System

(20 baht = 1 US dollar)

| Facility | Annual Costs (in baht) | | |
|---|---|---|---|
| | 1975 | 1977 | 1979 |
| Provincial Hospital[a] | 13,040,700 | 20,606,705 | 40,717,976 |
| District Hospital | NA | 564,462 | 843,258 |
| Subdistrict Health Center | 61,449 | 77,187 | 95,091 |
| Midwifery Center | 29,166 | 47,035 | 65,799 |

[a] Does not include capital depreciation costs or construction costs.
Source: Project Cost Analysis Survey

As might be expected, the Provincial Hospital, the largest single facility in the province, is the most expensive. Of the rural health facilities, the district hospital budget overshadows those of the more moderately financed subdistrict health centers and midwifery centers. Table 17 shows that the average budget available to each system component increased, at a minimum, 50% during the period of Project implementation.

A large proportion of the increase in annual expenditures at each facility level was a result of increased personnel costs. Table 18 shows the estimated average annual salary levels for health personnel categories in rural health facilities.

Salary levels increased between 20% and 40% for each worker category between 1975 and 1979 (in 1979 new salary increments were provided). Not only have personnel costs been the largest component of costs for every service component of the provincial delivery system, but their proportion of total costs at every service level has increased during the period of Project implementation. Table 19 shows the proportionate distribution of average costs for each facility level in the pre- and post-intervention periods.

Table 18

Average Annual Salaries for Major Health Personnel Categories in Rural Health Facilities[a]
(20 baht = 1 US dollar)

| Personnel Type | Annual Government Income[b] (in baht) | | |
|---|---|---|---|
| | 1977 | 1979 | % Change |
| Physician | ฿ 60,798 | ฿ 82,260 | + 35.3 |
| Nurse | 27,548 | 33,224 | + 20.6 |
| Nurse Aide | 16,306 | 20,545 | + 26.0 |
| Midwife | 20,558 | 27,209 | + 32.4 |
| Sanitarian | 19,140 | 26,198 | + 36.9 |
| Wechakorn Paraphysician (for rural locations only) | - | 28,498 | - |

[a]District Hospitals, Subdistrict Health Centers, Midwifery Centers.
[b]Includes base salary, fringe benefits and allowances.

Source: Project Cost Analysis, Provincial Health Office financial records.

Table 19

Distribution of Average Costs, by Cost Category, for Different Service Levels

| Cost Category | | % Allocation of Costs by Facility | | | |
|---|---|---|---|---|---|
| | | Provincial Hospital [a] | District Hospital | Subdistrict Hospital | Midwifery Center |
| Pre-Intervention | Salaries | 34.8 | 48.0 | 45.4 | 40.4 |
| | Expendables | 26.6 | 39.6 | 39.3 | 46.8 |
| | Maintenance | NA | 1.5 | 2.9 | 3.6 |
| | Capital | NA | 10.8 | 12.4 | 9.2 |
| | Av. Total Cost | ฿20,606,705 | ฿564,462 | ฿57,507 | ฿46,626 |
| Post-Intervention | Salaries | 32.9 | 51.7 | 56.3 | 46.2 |
| | Expendables | 23.7 | 40.0 | 35.4 | 46.1 |
| | Maintenance | NA | 1.7 | 1.3 | 1.4 |
| | Capital | NA | 6.6 | 7.0 | 6.3 |
| | Av. Total Cost | ฿40,717,976 | ฿843,259 | ฿97,606 | ฿63,604 |

[a]Only operational costs and no construction/land costs included; it is only possible to separate personnel and medical supply costs for the Provincial Hospital.

Source: Project Cost Analysis Survey.

The proportion of total operating costs allocated for salaries has increased in every service level except the provincial hospital, with the largest increases coming at the subdistrict and midwifery center levels. (This results from generally larger overall budget increases at the provincial and district hospitals which kept pace with personnel cost increases. At the subdistrict health center and midwifery center levels, increasing personnel costs surpassed the rate of increase in overall facility budgets.) The second most important cost item at all facility levels is expendables: consumable drugs and supplies related to service delivery. Personnel and expendables costs account for over 90% of all costs at rural facilities, and for well over 50% of costs in the Provincial Hospital.

## COST OF VOLUNTEER SERVICES

The major service categories of the health post volunteer for which data are available are medical care and family planning (pill distribution only). In the case of medical care services by volunteers, no direct cost to the health center responsible for the volunteers is involved, except for a small proportion of work time of the wechakorn, midwife, or sanitarian in rural facilities that is spent in supporting volunteers. There is an average of about ฿1.24 per contact paid for volunteer medical care services, but this is borne by the consumer and is not reflected in government facility costs. Family planning services, on the other hand, have a direct cost link to the government health facilities. All oral contraceptive pill cycles are provided by the government facility which has responsibility for the volunteers, be it a district hospital, subdistrict health center, or midwifery center. Therefore, the cost of the pills distributed by HPV's is included in the cost of family planning expendables for the health facility. But the volunteers' family planning service contacts are not included in the health facility activity data from the Task Analysis. Since expendables are a major part of family planning service costs, there needs to be a reduction in health facility costs to account for the cost of pills distributed by volunteers. This also then becomes one of the cost factors in estimating unit costs for volunteer family planning services.

Measuring the performance and costs of volunteers is, of course, only relevant in the post-intervention period, as there were no volunteers when pre-intervention data were collected. Only volunteer data for the areas where Task and Cost Analyses were conducted are utilized. The steps in the procedure follow.

| Type of Service | HPV Contacts (adjusted for underreporting) E1/2(1977) | E1/3(1979) | E2/FU(1979) |
|---|---|---|---|
| Medical Care | 9,217 | 16,283 | 82,513 |
| Family planning | 4,158 | 12,489 | 46,221 |

In the $E_1$ area, all government health facilities were surveyed during the Task Analysis, but in $E_2$, 35 of a total of 58 or 60% of facilities were surveyed. Therefore, the volunteer data are adjusted to make them comparable to the Task Analysis data. This is done by incorporating only 60% of the volunteer service totals in the $E_2$ area.

| Type of Service | HPV Contacts E1/2 | | E1/3 | | E2/FU | | Total | | Adjusted Total Contacts |
|---|---|---|---|---|---|---|---|---|---|
| Medical Care | 9,217 | + | 16,283 | + | 82,513 | = | 108,013 x 0.60 | = | 64,808 |
| Family Planning | 4,158 | + | 12,489 | + | 46,221 | = | 62,868 x 0.60 | = | 37,721 |

The major operational costs involved in supporting and maintaining health post volunteers are (1) the cost of government health worker time spent in supervising and supplying the volunteers and (2) the cost of expendables, that is, medicians and oral contraceptives used by volunteers.

Cost of Supervision/Support of Volunteers

The health workers who normally take responsibility for supervising and supporting volunteers are:

At the district hospital, the midwife and sanifarian
(wechakorn at this level do not generally supervise volunteers)
At the subdistrict health center, the wechakorn, midwife, and sanitarian
At the midwifery center, the midwife.

Each worker is responsible, on the average, for two to three volunteers, which would require a total of about one day of supervision and support each month. Therefore 1/20, or 5%, of the annual salaries of the health workers mentioned above are allocated to volunteer-related support through the following calculations:

| | District Hospital | Health Center | Midwifery Center |
|---|---|---|---|
| Av. Annual salary Costs: | | | |
| Wechakorn | - | ฿ 21,374 | - |
| Midwives | ฿ 49,883 | ฿ 13,604 | ฿ 27,209 |
| Sanitarians | ฿ 21,832 | ฿ 10,479 | - |
| | | ฿ 45,457 | |
| | | ÷ 3 | |
| | | ฿ 15,152 | |
| | | x 2[a] | |
| Total | ฿ 71,715 | ฿ 30,305 | ฿ 27,209 |
| Number of facility-years in survey | x 5 | x 34 | x 16 |
| Total salary costs | ฿ 358,575 | ฿1,030,370 | ฿ 435,344 |
| % of annual salary costs spent in supervising/ supporting HPV's | x .05 | x .05 | x .05 |
| Annual total cost of support for HPV's | ฿ 17,929 | ฿ 51,519 | ฿ 21,767 |
| Average annual cost of HPV support per facility | ฿ 3,586 | ฿ 1,515 | ฿ 1,360 |

[a] The normal two-person health center staff may be composed of a wechakorn and a sanitarian. Therefore, the average of the salary costs for the three worker types is multiplied by 2.

The health worker time spent in supporting volunteers is thus an input to producing volunteer services. The total cost of supervision of volunteers (฿17,929 + 51,519 + 21,767 = ฿91,215) is then arbitrarily divided by 2, and each half (฿ 45,608) is allocated equally as a cost component in computing total and unit costs of medical care and family planning services provided by HPV's. (It is assumed that support time is divided equally between the two service categories.)

## Cost of Family Planning Expendables for Volunteers

As shown earlier, the estimated number of volunteer family planning contacts in the areas covered by the facilities surveyed in the Task Analysis was 37,721. For each contact, the volunteers distributed, on the average, 1.1 pill cycles. Cost accounting in the Task Analysis valued one cycle of pills at 8 baht, so that

each family planning contact required 8.8 baht for expendables. Therefore, the total cost of pills distributed by HPV's in 1979 was ฿331,945 (37,721 x ฿8.8).

The cost of a HPV-provided medical care service is only $0.11 (฿2.19) and the cost of a HPV-provided family planning service is $0.65 (฿12.95).[a] There are no salary costs for volunteers. Other additional costs that might be incorporated could be prorated costs of preservice training and annual costs of refresher training. But these would be very small on a per-unit-service basis.

## MEASUREMENT OF SERVICE COSTS BEFORE AND AFTER PROJECT INTERVENTIONS

The data on service contacts and personnel time and activities in rural health facilities, supplemented by annual service data from health facility records and health volunteer reports, along with the cost data generated by the cost analysis, provide an important data base on which further analysis of service costs at each facility and by cost category can be carried out. A number of the basic service and cost data components needed for further analysis of service costs have been presented in previous tables, as listed:

Table 5 - breakdown of working time for different personnel categories at each facility level;

Table 6 - proportion of direct service time that was devoted to various service categories at each facility level;

Table 7 - estimated average number of service contacts per week at each facility type;

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[a]The computation of the unit cost for each type of HPV activity is as follows:

Average HPV Cost per Unit Service

| Cost Item | Medical Care Services | Family Planning Services |
|---|---|---|
| Salary costs | - | - |
| Total cost of supervision/support | ฿ 45,608 | ฿ 45,608 |
| Total cost of expendables | ฿ 96,079 (av.฿1.24/contact) | ฿ 402,741 (av.฿8.8/contact) |
| Total service cost | ฿ 141,687 | ฿ 448,349 |
| Total no. of services | 64,808 | 37,721 |
| Av. cost of an HPV service | ฿ 2.19 | ฿ 12.95 |

Table 10 - estimated number of services per week, including health post volunteer services;

Table 15 - average annual expenditures at each facility level in the Lampang delivery system;

Table 16 - estimated average personnel costs for each type of service worker in rural facilities; and

Table 17 - distribution of average annual expenditures at each facility level by expenditure category.

Several major steps were required to integrate these data sets. First, each major expenditure category at the various facility types was allocated by service category, as shown in Table 20 which is an expansion of Table 17. The allocation of capital, maintenance, and expendables costs to each of the service categories was based on the number of service contacts observed during Task Analysis. However, salaries were treated differently. They were allocated to the service categories based on the proportion of time workers spent in providing services in each category.

A number of adjustments had to be made to the time distribution for worker categories in each facility to make the distribution suitable for further analysis. First, during follow-up data collection, there were a number of trainees (wechakorn, sanitarians, midwives) present in many of the health facilities surveyed. Since the trainees were not part of the facilities' routine staff, they contributed some service time, but were also observed to have a large amount of nonproductive time. Therefore, it was assumed that such trainees were not the normal staff complement, and that the service time and services provided as part of their field training would normally have been carried out by the facilities' resident staff members. Thus, all direct service time spent by trainees was added to direct service time for the facilities' full-time staff members (e.g., a sanitarian trainee's direct service time was transferred to the service time of the facility's sanitarian).

Second, in midwifery centers, there was occasionally an additional worker assisting the resident midwife. Assuming that the midwife is normally the only person staffing this type of facility, all productive time was transferred to the single midwife. In the case of both trainees and additional workers, the consolidation of service time into that of the normally present staff tended to slightly reduce the total nonproductive time.

## Table 20

**Distribution of Average Annual Health Facility Costs, by Cost and Service Category, Pre- and Post-Intervention Periods**

| | Pre-Intervention Costs | | | | | | Post-Intervention Costs | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | District Hospital | | Health Center | | Midwifery Center | | District Hospital | | Health Center | | Midwifery Center | |
| | | % | | % | | % | | % | | % | | % |
| CAPITAL | ฿ 61,103 | 10.8 | ฿ 7,124 | 12.4 | ฿4,280 | 9.2 | ฿ 55,431 | 6.6 | ฿ 6,858 | 7.0 | ฿ 3,987 | 6.3 |
| % - Medical Care | 30.9 | | 21.3 | | 18.1 | | 65.7 | | 58.2 | | 57.7 | |
| - CDC/San. | 19.0 | | 15.1 | | 11.7 | | 8.5 | | 6.7 | | 6.2 | |
| - MCH | 19.6 | | 33.9 | | 26.4 | | 9.4 | | 16.4 | | 9.9 | |
| - FP | 30.5 | | 27.9 | | 43.7 | | 16.3 | | 17.9 | | 25.0 | |
| - Nutrition | - | | 1.8 | | 0.1 | | 0.1 | | 0.8 | | 1.2 | |
| MAINTENANCE | ฿ 8,591 | 1.5 | ฿ 1,669 | 2.9 | ฿1,686 | 3.6 | ฿ 14,564 | 1.7 | ฿ 1,293 | 1.3 | ฿898 | 1.4 |
| % - Medical Care | 30.9 | | 21.5 | | 17.2 | | 61.4 | | 57.5 | | 59.6 | |
| - CDC/San. | 19.0 | | 17.6 | | 12.0 | | 11.8 | | 6.9 | | 6.7 | |
| - MCH | 19.6 | | 33.0 | | 29.0 | | 9.7 | | 15.2 | | 6.6 | |
| - FP | 30.5 | | 25.6 | | 41.7 | | 17.0 | | 19.5 | | 26.1 | |
| - Nutrition | - | | 2.3 | | 0.1 | | 0.1 | | 0.9 | | 1.0 | |
| EXPENDABLES | ฿223,518 | 39.6 | ฿22,606 | 39.3 | ฿21,839 | 46.8 | ฿337,711 | 40.0 | ฿34,555 | 35.4 | ฿29,329 | 46.1 |
| % - Medical Care | 52.5 | | 7.9 | | 9.0 | | 75.2 | | 25.4 | | 17.6 | |
| - CDC/San. | 1.2 | | 3.1 | | 3.6 | | 10.1 | | 2.0 | | 9.7 | |
| - MCH | 0.8 | | 1.8 | | 2.0 | | 2.5 | | 5.1 | | 3.9 | |
| - FP | 45.5 | | 85.5 | | 85.4 | | 9.9 | | 61.4 | | 56.0 | |
| - Nutrition | - | | 1.7 | | 0.0 | | 2.3 | | 6.1 | | 12.8 | |
| SALARIES | ฿271,250 | 48.0 | ฿26,108 | 45.4 | ฿18,821 | 40.4 | ฿435,553 | 51.7 | ฿54,900 | 56.3 | ฿29,390 | 46.2 |
| TOTAL COSTS | ฿564,462 | | ฿57,507 | | ฿46,626 | | ฿843,259 | | ฿97,606 | | ฿63,604 | |

Key to abbreviations: CDC/San = Communicable Diseases Control/Sanitation
MCH = Maternal/Child Health
FP = Family Planning

Third, indirect service time and nonproductive time constituted a large proportion of total working time available at all facility levels. To allocate the total costs of personnel time into each service category, it was assumed that indirect service time (spent in preparing records, materials, etc.) is closely associated with time spent in providing direct services. Therefore, indirect service time was allocated to specific service categories based on the proportion of direct service time spent in each category. Nonproductive time was similarly allocated. Allocating indirect service time and nonproductive time for costing total personnel time in this manner may not be completely realistic, but is probably most reasonable under the conditions operating.

Finally, because Task Analysis observations were only made of activities inside the health facilities surveyed, the cost of field work could not be attributed to any specific service categories. Nor are any of the nonsalary costs allocated in support of field work. However, because of the small amount of personnel time devoted to field work, the effect on the calculation of service costs by category is limited.

The next step in analysis was to translate the proportion of total time spent by each worker in different service categories into actual time spent in a year. First, the minutes per week spent in the different service functions by each worker of the health facility's normal staff complement were calculated. Combining the time spent in each service category with the number of service contacts recorded in a typical week provided an expression of the average time per 1000 service contacts by each worker in each facility. Since the annual salary of health workers is known, then calculation of the cost per minute of service time is possible, leading to estimates of cost per 1000 service contacts per week. If the weekly service contacts of each type are multiplied by 52, then the resulting annual total can be multiplied times minutes and cost per 1000 services to produce an estimate of the annual hours of time and personnel costs for each category of service.

Likewise, the weekly average proportion of time spent in the field was translated into annual hours spent in the field; using the annual salary costs per worker permits derivation of cost of annual field work time per worker.

The series of computations and assumptions described above provides results leading to estimates of costs per unit service category. Table 21 summarizes the estimated annual costs at each service level by service category.

## Table 21

Estimated Annual Total Costs, by Facility Type and Function
(all figures in baht, where U.S.$1 = ฿20)

### Part A. District Hospitals

| | Pre-Intervention | | | | | | Post-Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC | CDC/S | MCH | FP | Nut | Total | MC | CDC/S | MCH | FP | Nut | Total |
| Capital | 18,881 | 11,610 | 11,976 | 18,636 | - | 61,103 | 36,463 | 4,701 | 5,192 | 9,034 | 41 | 55,431 |
| Maintenance | 2,655 | 1,632 | 1,684 | 2,620 | - | 8,591 | 8,955 | 1,713 | 1,408 | 2,477 | 11 | 14,564 |
| Expendables | 117,347 | 2,682 | 1,788 | 101,701 | - | 223,518 | 254,035 | 34,085 | 8,533 | 33,360 | 7,698 | 337,711 |
| Salaries | | | | | | | | | | | | |
| - Direct | 28,460 | 185 | 2,124 | 3,836 | 82 | 34,687 | 51,496 | 2,907 | 7,424 | 5,774 | 316 | 67,917 |
| - Indirect | 72,812 | 296 | 3,581 | 6,495 | 148 | 83,332 | 78,637 | 6,476 | 17,054 | 14,725 | 993 | 117,885 |
| - Field | - | - | - | - | - | 649 | - | - | - | - | - | 18,515 |
| - Non-Productive | 125,853 | 598 | 7,090 | 12,838 | 287 | 146,666 | 146,574 | 10,568 | 27,570 | 23,089 | 1,474 | 209,275 |
| Totals | 366,008 | 17,003 | 28,243 | 146,126 | 517 | 558,546 | 576,160 | 60,450 | 67,181 | 88,459 | 10,533 | 821,298 |

### Part B. Subdistrict Health Centers

| | Pre-Intervention | | | | | | Post-Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC | CDC/S | MCH | FP | Nut | Total | MC | CDC/S | MCH | FP | Nut | Total |
| Capital | 1,517 | 1,076 | 2,415 | 1,988 | 128 | 7,124 | 3,990 | 459 | 1,125 | 1,227 | 57 | 6,858 |
| Maintenance | 359 | 294 | 551 | 427 | 38 | 1,669 | 744 | 89 | 197 | 252 | 11 | 1,293 |
| Expendables | 1,786 | 701 | 407 | 19,328 | 384 | 22,606 | 8,783 | 686 | 1,769 | 21,216 | 2,101 | 34,555 |
| Salaries | | | | | | | | | | | | |
| - Direct | 1,841 | 169 | 506 | 802 | 45 | 3,363 | 5,639 | 1,909 | 1,097 | 767 | 249 | 9,661 |
| - Indirect | 6,136 | 527 | 1,464 | 2,566 | 165 | 10,858 | 14,087 | 5,015 | 2,805 | 1,996 | 635 | 24,538 |
| - Field | - | - | - | - | - | 5,065 | - | - | - | - | - | 4,291 |
| -Non-Productive | 6,838 | 597 | 1,689 | 2,886 | 180 | 12,190 | 8,167 | 2,866 | 1,615 | 1,144 | 366 | 14,158 |
| Totals | 18,477 | 3,364 | 7,032 | 27,997 | 940 | 62,875 | 41,410 | 11,024 | 8,608 | 26,602 | 3,419 | 95,354 |

Key to abbreviations:
MC = Medical Contacts
CDC/S = Communicable Diseases Control/Sanitation
MCH = Maternal/Child Health
FP = Family Planning
NUT = Nutrition

Table 21 (cont'd)

Estimated Annual Total Costs by Facility Type and Function (in Baht)

Part C. Midwifery Centers

| | Pre-Intervention | | | | | | Post-Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC | CDC/S | MCH | FP | Nut | Total | MC | CDC/S | MCH | FP | Nut | Total |
| Capital | 775 | 501 | 1,130 | 1,870 | 4 | 4,280 | 2,300 | 248 | 395 | 997 | 47 | 3,987 |
| Maintenance | 290 | 202 | 489 | 703 | 2 | 1,686 | 536 | 60 | 59 | 234 | 9 | 898 |
| Expendables | 1,966 | 786 | 437 | 18,650 | 0 | 21,839 | 5,161 | 2,848 | 1,152 | 16,411 | 3,757 | 29,329 |
| Salaries | | | | | | | | | | | | |
| - Direct | 1,977 | 43 | 329 | 364 | 10 | 2,723 | 1,997 | 233 | 791 | 518 | 74 | 3,613 |
| - Indirect | 4,520 | 97 | 752 | 1,456 | 23 | 6,848 | 7,623 | 918 | 3,010 | 1,968 | 282 | 13,801 |
| - Field | - | - | - | - | - | 2,841 | - | - | - | - | - | 2,413 |
| - Non-Productive | 5,530 | 119 | 920 | 1,549 | 28 | 8,146 | 4,078 | 488 | 1,611 | 1,054 | 151 | 7,382 |
| Total | 15,058 | 1,748 | 4,057 | 24,592 | 67 | 48,363 | 21,695 | 4,795 | 7,018 | 21,182 | 4,320 | 61,423 |

Costs in each service category are broken down into capital, maintenance, expendables, and personnel costs. Dividing each of these cost totals by the annual number of service contacts results in an estimate of the cost per service contact at each facility level. These unit service costs are summarized in Table 22.

The data shown in Tables 21 and 22 suggest substantial increases in the cost per service contact of every type in the post-intervention period. The apparent increase in cost is a result of inflation, large salary increases,and changes in staffing patterns and the efficiency of service delivery. Changes in the pattern of service delivery are, in part, a result of sharing some service responsibilities (e.g., for medical care and contraceptive distribution) of rural health facilities with health volunteers. The unit service costs in Table 21, however, do not reflect the contribution of health volunteers associated with each service facility, nor do they incorporate the nutrition services provided by Child Nutrition Centers (both of which are under government health worker supervision). To provide a more complete and accurate picture of costs of services associated with each type of rural facility, and to make comparisons more realistic,several additional steps have been taken. These are:

(1) To eliminate the effects of inflation and other cost increases, post-intervention service data are standardized on pre-intervention costs.

(2) The services provided by health post volunteers are incorporated into the service output of each facility, which directly affects the average cost per medical care and family planning service in the post-intervention period.

(3) Service contacts at Child Nutrition Centers are also incorporated into the service output at each facility, which influences post-intervention nutrition costs.

## Standardized Service Costs

The effects of sharp provincial health budgetary increases, together with inflation, serve to complicate comparison of costs between the pre- and post-intervention periods. To more clearly distinguish the effect of changing service delivery and working patterns on service costs, post-intervention service data have been standardized with pre-intervention service costs, as shown in Table 23. Although the standardized costs for most service categories show an increase in the post-intervention period, the increase is generally more

## Table 22

Estimated Cost per Service Contact, by Facility Type and Function
(All figures in baht, where U.S.$1 = ฿23)

### Part A. District Hospitals

| | Pre-Intervention | | | | | | Post-Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC | CDC/S | MCH | FP | Nut | Total | MC | CDC/S | MCH | FP | Nut | Total |
| No. Serv. Contacts | 6,070 | 988 | 2,314 | 4,420 | 208 | 14,000 | 6,796 | 1,092 | 1,231 | 2,392 | 43 | 11,554 |
| Capital Cost | 3.11 | 11.75 | 5.18 | 4.22 | - | 4.36 | 5.37 | 4.30 | 4.22 | 3.78 | 0.95 | 4.80 |
| Maintenance | 0.44 | 1.65 | 0.73 | 0.59 | - | 0.61 | 1.32 | 1.57 | 1.14 | 1.04 | 0.26 | 1.26 |
| Expendables | 19.33 | 2.71 | 0.77 | 23.01 | - | 15.97 | 37.38 | 31.21 | 6.93 | 13.95 | 179.02 | 29.23 |
| Salaries | | | | | | | | | | | | |
| - Direct | 4.69 | 0.19 | 0.92 | 0.87 | 0.39 | 2.48 | 7.58 | 2.66 | 6.03 | 2.41 | 7.35 | 5.88 |
| - Indirect | 12.00 | 0.30 | 1.55 | 1.47 | 0.71 | 5.95 | 11.57 | 5.93 | 13.85 | 6.16 | 23.09 | 10.20 |
| - Non-Productive | 20.73 | 0.61 | 3.06 | 2.90 | 1.38 | 10.48 | 21.57 | 9.69 | 22.40 | 9.64 | 34.28 | 18.11 |
| Totals | 60.30 | 17.21 | 12.21 | 33.06 | 2.48 | 39.85 | 84.79 | 55.36 | 54.57 | 36.98 | 244.95 | 69.48 |

### Part B. Subdistrict Health Centers

| | Pre-Intervention | | | | | | Post-Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC | CDC/S | MCH | FP | Nut | Total | MC | CDC/S | MCH | FP | Nut | Total |
| No. Serv. Contacts | 1,836 | 1,177 | 369 | 629 | 732 | 4,143 | 2,098 | 467 | 442 | 658 | 49 | 3,714 |
| Capital Cost | 0.83 | 0.91 | 6.54 | 3.16 | 0.97 | 1.72 | 1.90 | 0.98 | 2.55 | 1.86 | 1.16 | 1.85 |
| Maintenance | 0.20 | 0.25 | 1.49 | 0.68 | 0.29 | 0.40 | 0.35 | 0.19 | 0.45 | 0.38 | 0.22 | 0.35 |
| Expendable | 0.97 | 0.60 | 1.10 | 30.72 | 2.92 | 5.46 | 4.19 | 1.47 | 4.00 | 32.24 | 42.88 | 9.30 |
| Salaries | | | | | | | | | | | | |
| - Direct | 1.00 | 0.14 | 1.37 | 1.27 | 0.34 | 0.81 | 2.69 | 4.09 | 2.48 | 1.17 | 5.08 | 2.60 |
| - Indirect | 3.34 | 0.45 | 3.97 | 4.08 | 1.25 | 2.62 | 6.71 | 10.74 | 6.35 | 3.03 | 12.96 | 6.61 |
| - Non-Productive | 3.73 | 0.51 | 4.58 | 4.59 | 1.37 | 2.94 | 3.89 | 6.14 | 3.65 | 1.75 | 7.48 | 3.81 |
| Totals | 10.07 | 2.86 | 19.05 | 44.50 | 7.14 | 13.95 | 19.73 | 23.61 | 19.48 | 40.43 | 69.78 | 24.52 |

Table 22 (cont'd)

Estimated Cost per Service Contact, by Facility Type and Function (in baht)

Part C. Midwifery Centers

| | Pre-Intervention | | | | | | Post-Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC | CDC/S | MCH | FP | Nut | Total | MC | CDC/S | MCH | FP | Nut | Total |
| No. Serv. Contacts | 1,754 | 194 | 374 | 856 | 2 | 3,181 | 1,104 | 172 | 400 | 577 | 66 | 2,319 |
| Capital Cost | 0.44 | 2.58 | 3.02 | 2.18 | 2.33 | 1.34 | 2.08 | 1.44 | 0.99 | 1.73 | 0.71 | 1.72 |
| Maintenance | 0.16 | 1.04 | 1.31 | 0.82 | 1.16 | 0.53 | 0.49 | 0.35 | 0.15 | 0.41 | 0.14 | 0.39 |
| Expendables | 1.12 | 4.05 | 1.17 | 21.78 | 0 | 6.87 | 4.67 | 16.56 | 2.88 | 28.44 | 56.92 | 12.65 |
| Salaries | | | | | | | | | | | | |
| - Direct | 1.13 | 0.22 | 0.88 | 0.43 | 5.81 | 0.86 | 1.81 | 1.35 | 1.98 | 0.90 | 1.12 | 1.56 |
| - Indirect | 2.58 | 0.50 | 2.01 | 1.70 | 13.37 | 2.15 | 6.91 | 5.34 | 7.52 | 3.41 | 4.27 | 5.95 |
| - Non-Productive | 3.15 | 0.61 | 2.46 | 1.81 | 16.28 | 2.56 | 3.69 | 2.84 | 4.02 | 1.82 | 2.29 | 3.18 |
| Totals | 8.58 | 9.00 | 10.85 | 28.72 | 38.95 | 14.31 | 19.65 | 27.88 | 17.54 | 36.71 | 65.45 | 25.45 |

Table 23

Cost per Service: Post-Intervention Service Contacts
Standardized on Pre-Intervention Costs (in Baht)

| | | Service Category | | | | | |
|---|---|---|---|---|---|---|---|
| | | MC | CDC/S | MCH | FP | Nut | All Services |
| District Hospital | Post-Intervention annual service contacts | 6,796 | 1,092 | 1,231 | 2,392 | 43 | 11,554 |
| | Pre-Intervention annual expenditures | ฿356,125 | ฿16,834 | ฿46,259 | ฿144,727 | ฿ 481 | ฿564,462 |
| | Cost/service | ฿ 52.40 | ฿ 15.42 | ฿ 37.62 | ฿ 60.50 | ฿ 11.11 | ฿ 48.85 |
| | Pre-Intervention Cost/service | ฿ 60.30 | ฿ 17.21 | ฿ 12.21 | ฿ 33.06 | ฿ 2.48 | ฿ 39.85 |
| Health Center | Post-Intervention annual service contacts | 2,098 | 467 | 442 | 658 | 49 | 3,714 |
| | Pre-Intervention annual expenditures | ฿ 18,190 | ฿ 2,371 | ฿ 6,919 | ฿ 29,156 | ฿ 871 | ฿ 57,507 |
| | Cost/service | ฿ 8.67 | ฿ 5.08 | ฿ 15.65 | ฿ 44.31 | ฿ 17.78 | ฿ 15.48 |
| | Pre-Intervention Cost/service | ฿ 10.07 | ฿ 2.86 | ฿ 19.05 | ฿ 44.50 | ฿ 7.14 | ฿ 13.95 |
| Midwifery Center | Post-Intervention annual service contacts | 1,104 | 172 | 400 | 577 | 66 | 2,319 |
| | Pre-Intervention annual expenditures | ฿ 15,003 | ฿ 1,835 | ฿ 4,600 | ฿ 25,093 | ฿ 95 | ฿ 46,626 |
| | Cost/service | ฿ 13.59 | ฿ 10.67 | ฿ 11.50 | ฿ 43.49 | ฿ 1.44 | ฿ 20.11 |
| | Pre-Intervention Cost/service | ฿ 8.58 | ฿ 9.00 | ฿ 10.85 | ฿ 28.72 | ฿ 39.95 | ฿ 14.31 |

moderate than those shown in Table 22. Wherever an increase in average number of services in each category has occurred, a decrease in cost per service results.

## Integrating Volunteer Services

The services provided by health volunteers should be combined with the services in each facility in cost computations. Since most costs of supplying and supporting volunteers are already a part of the annual expenditures of each health facility, the addition of volunteer services (medical care and family planning) tends to reduce the cost per service contact. Table 10 showed the estimated average weekly number of volunteer medical care and family planning contacts associated with each facility. The weekly service contacts in each category were then multiplied by 52 and added to the annual service contacts of the same type (e.g., medical care and family planning) at each facility level. For family planning contacts there is a difference in the content of a volunteer contact and a rural health facility contact. On the average, each volunteer distributes 1.1 oral contraceptive packs per contact, whereas the government facility, on the average, distributes 1.68 cycles per contact. Therefore, before volunteer family planning contacts were added to each health facility total, they were divided by the factor $\frac{1.68}{1.1} = 1.53$ to make the volunteer pill contacts equivalent to those at health facilities.

By first adding the health post volunteer service contribution to each facility's output, there are pronounced effects on the average cost per medical care and family planning contact. Table 24 shows the cost per contact after volunteer services have been incorporated. The volunteer service output associated with each

Table 24

Estimated Average Cost per Service Contact
(Adjusted to Include Volunteer Services)
Pre- and Post-Intervention Periods

(20 baht = 1US$)

| Facility | | Cost per Contact by Service Category (Baht) | | | | | |
|---|---|---|---|---|---|---|---|
| | | MC | CDC/S | MCH | FP | NUT | All Services |
| Pre Intervention | Dist. Hospital | 60.30 | 17.21 | 12.21 | 33.06 | 2.48 | 39.85 |
| | Subdist. HC | 10.07 | 2.86 | 19.05 | 44.50 | 7.[illegible] | 13.45 |
| | Midwifery Center | 8.58 | 9.00 | 10.85 | 28.72 | 39.95 | 14.31 |
| Post Intervention | Dist. Hospital | 69.78 | 55.36 | 54.57 | 29.35 | 244.95 | 60.22 |
| | Subdist. HC | 11.63 | 23.61 | 19.48 | 20.78 | 69.78 | 16.46 |
| | Midwifery Center | 8.46 | 27.88 | 17.54 | 17.66 | 65.45 | 13.95 |

facility level has served to hold costs per medical care contact fairly stable (despite sharply rising total facilities costs), and has led to a decrease in the unit cost of family planning services.

Incorporating Child Nutrition Centers (CNC)

The service data for Child Nutrition Centers, shown in Tables 10 and 11, must likewise be integrated. To also analyze CNC costs, some further adjustments are necessary. Costs for Child Nutrition Center operations are normally borne by village families by paying a small monthly charge to have their children attend. However, nutrition supplements are provided to CNC's by the local government rural health facility which is responsible for the CNC. The cost of nutrition supplements is already included in the cost analysis "expendables" category at each facility. In addition, each CNC had an attendant who received ฿400 per month (some received it from the Ministry of Public Health, others from the local contributions). These salary costs must also be added to nutrition service costs. CNC attendant salary costs for 1979 were as follows:

| | |
|---|---|
| Annual attendant salary | ฿ 4,800 |
| Total CNC facility-years in Lampang | x 76.17 |
| Total salary expenditure in 1979 | ฿ 365,616 |
| Total rural facilities | ÷ 107 |
| Average annual cost/rural facility | ฿3,416.97 |

When both average volunteer and Child Nutrition Center contacts have been added to each facility's service output, the result is a dramatic drop in average cost per nutrition service, as well as in the average cost of all service contacts, as seen in Table 25. Care must be taken in comparing pre- and post-intervention

Table 25

Estimated Cost per Service Contact
(Adjusted to Include Volunteer and CNC Services)
Pre- and Post-Intervention Periods

| Facility | | Cost per Contact by Service Category (Baht) | | | | | |
|---|---|---|---|---|---|---|---|
| | | MC | CDC/S | MCH | FP | NUT | All Services |
| Pre Intervention | Dist. Hospital | 60.30 | 17.21 | 12.21 | 33.06 | 2.48 | 39.85 |
| | Subdist. HC | 10.07 | 2.86 | 19.05 | 44.50 | 7.14 | 13.45 |
| | Midwifery Center | 8.58 | 9.00 | 10.85 | 28.72 | 39.95 | 14.31 |
| Post Intervention | Dist. Hospital | 69.78 | 55.35 | 54.57 | 29.35 | 2.90 | 44.63 |
| | Subdist. HC | 11.53 | 23.61 | 19.48 | 20.78 | 1.42 | 9.03 |
| | Midwifery Center | 8.46 | 27.88 | 17.54 | 17.66 | 1.60 | 6.70 |

nutrition costs, as the CNC service data for the pre-intervention period were not available. (This would have made pre-intervention nutrition costs slightly less than Table 25 shows. Moreover, the total CNC service contacts are the result of a small number of children attending the centers repeatedly.)

## EXPANSION AND PERFORMANCE OF THE HEALTH CARE DELIVERY SYSTEM

During the course of Lampang Project operations, the numbers of facilities and manpower, along with the range of services and geographic coverage, have increased substantially. Part of this change was a result of Project activities, and a part resulted from implementation of the development plan of the Ministry of Public Health. This led to a modified framework for health service delivery which was intact and functioning as the Project completed its field implementation in 1979. The overall output of services also sharply increased, in part due to the increased number of government facilities available, and in part due to the introduction of new service providers such as wechakorn in government health facilities and health volunteers in rural villages. Monograph 8 documents the dramatic increase in utilization of available services by the important target groups in need.

When the internal functioning of the individual components of the health delivery system is scrutinized more closely, relatively little change in both service output and the pattern of the service delivery is apparent. This may not be surprising, as the number of facilities has increased sharply, and a number of major health facility activities are now shared with village health volunteers.

When the volunteer services associated with all government facilities are allocated to those facilities, the overall performance, or service output, at every facility level is more impressive, and the overall service output of the total system in much enhanced.

Moreover, there has been an increasingly greater proportion of services provided at the rural periphery of the system during the period of Project implementation. Although the services provided by the Provincial Hospital have increased sharply, the majority of hospital utilization is by people living in districts close to the hospital, and villagers living at a greater distance from the hospital appear to have sought services closer to their homes. As the total output of rural health facilities and Community Health Volunteers has increased, the hospital's proportion of

total health services provision has dropped. With the introduction of wechakorns and with the addition of community health volunteers, government facilities are more attractive to consumers, as they are now offering a better range of services and medicines, at facilities (or health posts) more conveniently located and staffed by more competent workers. The health volunteers provide simple services, but they are conveniently close to the villagers' homes, and the services are offered by a person who is readily accessible and socially close to the potential user.

Community health survey data and other survey data confirm the increased use of government-supported services by the rural population, particularly by the target group women and children.

The service output of the health care delivery system has clearly increased, but a natural question is whether the nature or content of the services has the potential to effectively serve the community health needs. The answer to such a question may be found in reviewing the types of services which constitute the output of the various components of the delivery system, along with a review of how health workers spend their time in the newly-reorganized system.

## Medical Care

On reviewing the distribution of service contacts and the distribution of time spent by health workers in rural facilities a striking feature is the predominance of medical care as the major activity in all facilities. Well over 50% of all service contacts, and of all direct service time spent by health workers, is devoted to providing medical care. In terms of the potential number of users, medical care need is probably greatest in the rural areas. However, the Community Health Survey has indicated that less than 30% of the rural population utilizes government health services when ill (and less than 20% of ill people go to government rural health facilities -- district hospitals, subdistrict health centers, and midwifery centers-- as their first choice). Yet the majority of health worker time is devoted to a small proportion of those in need. It should be noted that there was a decline in total service time devoted to medical care in many facilities during the post-intervention period. However, with the addition of wechakorn to most health facilities, medical care continued to be the in predominant activity.

## Family Planning

Family planning has in recent years been the second most important activity, in terms of service contacts and service time spent by health workers. Government-supported providers (including HPV's) served about 85% of all women currently practicing family planning, making the government the major provider of family planning

services. In all rural facility levels, however, an overall decrease in the proportion of time spent in family planning services, as well as in the average number of service contacts, was observed. Since most family planning contacts in rural health facilities are oral contraceptive distribution contacts, this decline in the service load at health facilities generally reflects the sharing of contraceptive distribution with health post volunteers. Volunteer service statistics confirm their major role in oral contraceptive distribution, and the Community Health Survey indicated that 20% to 30% of oral contraceptive users got their supplies from the local health post volunteer.

Maternal Services

Maternal services continued to be the third major focus of health service delivery in the provincial health care delivery system. The Provincial Hospital is the major provider of maternal services. The number of deliveries in the Provincial Hospital has sharply increased during the course of Project implementation, as has the number of prenatal visits to the hospital. The Community Health Survey also indicates that the Provincial Hospital accounts for between 30% and 40% of all deliveries in the province. About one-third of all deliveries are performed by traditional birth attendants, and less than one-third are done by wechakorn and other staff of rural health facilities. Also, the proportion of pregnant women who received at least one prenatal examination greatly increased.

There was a major decline in the number of MCH contacts at district hospitals, but a slight increase in such contacts at the subdistrict and midwifery center levels. At the same time, there was also a sharp increase in the amount of direct service time spent on maternal and child health at all facility levels except the subdistrict health center. In general, with declining fertility levels, the demand on the time of service personnel -- particularly midwives -- who have traditionally been responsible for women's services may also be declining. Renewed emphasis may therefore be given to more frequent prenatal care and to postnatal services, which have been less frequently utilized.

Communicable Disease Control and Sanitation

Communicable disease control (predominantly immunizations) and environmental sanitation (primarily water supply and waste disposal) received renewed interest during the period of project implementation. A sharp increase in the amount of service time spent on CDC and environmental sanitation was apparent at all rural health facility levels in the post-intervention period. However, the number of service contacts of this type did not follow the same pattern, most likely a result

of the nonpersonal nature of sanitation work. The Community Health Survey also reflected an improvement in household water supply and sanitation conditions in the implementation areas, and a general increase in levels of immunization of preschool children.

Nutrition Services

A major thrust for improving child nutrition services in the provincial rural health care delivery system during the period of Project implementation has been the village-level Child Nutrition Centers. These centers are designed to provide children between the ages of 30 months and 6 years with day-care and preschool educational activities, as well as some nutrition supplementation and health education. Monitoring of the children's height, weight and general health status is also done on a routine basis. Other activities provided through government health facilities include: nutrition education for mothers, treatment of seriously undernourished children (at all facility levels) and nutrition surveillance activities (on a pilot basis).

During the Task Analysis surveys at rural health facilities, very few direct nutrition services and no CNC activities were observed, despite the fact that many of the health facilities have a Child Nutrition Center attached. This was the result of the relative independence of the Child Nutrition Centers, which have their own locally hired attendants and receive only occasional supervision by the government midwife. Therefore, although the survey data show very little activity in the area of nutrition, rural health workers are actually involved with CNC's, and a sizable number of preschool children do receive services at Child Nutrition Centers. Nevertheless, the number of children who were registered in Child Nutrition Centers throughout the province was only a very small proportion of all preschool children -- less than 10%. The majority of children who attend CNC's are not those who have severe nutritional problems. Nor are the children attending the Child Nutrition Centers normally from the poorest families where severe malnutrition is most prevalent, as there is normally a monthly payment of ฿10 ($0.43) or more required. Moreover, those children in the age groups under 30 months who have serious malnutrition problems would not normally be eligible for attendance at a Child Nutrition Center.

The Community Health Survey has shown a relatively high level of undernutrition in the preschool age groups; more important, the level of undernutrition did not change significantly during the period of Project implementation. It is recognized that nutritional status is the result of a complex number of social, economic, educational, and cultural factors. Nevertheless, it seems clear that the focus of Project

and provincial health nutrition interventions has not directly confronted or adequately served nutrition needs.

Although the overall service output and delivery of services in several specific categories have progressed significantly during the period of project operations, there still remains considerable potential to further expand activities in areas currently underemphasized. A major feature which also stands out when reviewing the internal operations of rural facilities is the large proportion of total work time that is spent nonproductively. In general, the larger the facility and the larger number of staff, the larger is the proportion of work time classified as nonproductive. The proportion of time classified as nonproductive did decrease in the post-intervention period (accompanied by an increase in proportion of time devoted to direct service delivery), but still remained quite large. Also, the proportion of time devoted to field work, which included most of the community health-type activities, has been only a very small proportion of total health worker time, and has decreased in the post-intervention period. Overall, there appears to be sufficient slack time available to further expand health worker activity into program areas of high priority.

There appears to be only a moderate modification in the pattern of performance of health workers and facilities in the post-intervention system. The presence of the wechakorn may have accentuated the focus on medical care in most facilities, but it has also freed other workers to become more involved in community health promotion and preventive health activities. The village health volunteers have expanded the reach of the service system, and have made simple care for illness and family planning services available close to villagers' homes. But the modified system has not sufficiently emphasized all areas where needs may be greatest -- nutrition, child health, and water supply and sanitation. The modified system tends to reemphasize medical care, which ultimately has less influence on health status; although medical care services build credibility in eyes of rural villagers, this credibility has not been used by health workers to further promote disease prevention and health promotion activities sufficiently.

It seems clear that where the system has been modified and has focussed on specific program areas, such as medical care, family planning, and maternal and child health, considerable progress has occurred. If a similar reorientation of the system to remaining problems of high priority were made, similar progress in resolving these problems would be expected.

# HEALTH CARE COSTS

Overall government and Ministry of Public Health expenditures on health more than doubled in the years the Lampang Project was in operation, as did national per capita expenditures on health. However, much of this increase was a result of inflation, which has run from 9% to almost 20% annually during the period. Therefore the real increase in expenditures on health is probably nearer to 20% or 25%, still a substantial amount. At the provincial level, overall expenditures and per capita expenditures on health have shown similar trends. It is clear that the costs of operating the whole system and each of its individual components have increased dramatically, and will probably continue to do so.

A review of the Ministry of Public Health budget as a whole, as well as the costs of the provincial health service structure, show that the major MOPH budgetary emphasis is on medical or curative care. About 70% of the provincial budget is devoted to providing medical services -- mostly the Provincial Hospital. Even in the facilities more traditionally responsible for preventive services -- the subdistrict health centers and midwifery centers -- the major activities and the largest proportion of costs are devoted to medical care.

Along with medical care, however, many workers are now doing more community health work, and the family planning structure has been extended through the volunteer network. But even among health post volunteers, simple medical care remains their major activity. In a sense, the Lampang Project has only slightly deflected the bias of the entire system toward medical care. Medical care is the activity that generates the most prestige; it is personally satisfying to the provider; it can bring financial rewards; and it is the service that rural villagers perceive as needed and seek out most actively. In contrast, providing preventive services is less satisfying to health workers, and such services are not perceived as important by many rural villagers.

## Costs by Service Type

Because personnel and other costs rose sharply at each facility level during the period of project operations, and because there were generally no commensurate increases in average service output within each facility type, costs for services provided within rural facilities generally increased. Even when post-intervention service output data are standardized with pre-intervention cost data, there is still a slight increase in cost per service. At first glance, this result may seem unexpected, but it does not reflect the actual change in the pattern of service

delivery and costs. The low-cost character of the health volunteer network has an important influence on the cost of rural health services. Although volunteers provide mostly medical care and family planning services, adding their output to each facility with which they are affiliated adds only very marginal costs and reduces the cost per service contact. Therefore services at rural health facilities, when combined with the low-cost service output of volunteers under their responsibility, are more cost-effective. This is not true for all service categories. Some categories did not show the overall decrease in cost per service contact. However, the crucial factor in the general decrease in service costs is the volunteer contribution.

On the other hand, sharing of work with volunteers, particularly in the area of family planning, has contributed to a reduced work load at some government health facilities, and has therefore led to increased slack time, associated with increased costs for services provided at that facility. Consequently, when a sharing of specific health activities with volunteers is planned and implemented, new activities must be planned to take up the slack created. Increased support and supervision of volunteers and stimulation of other critical community health programs could be two means of filling the slack time created.

Cost Implications

The Lampang Project differed from many other pilot research or demonstration health projects in that the existing provincial health care delivery structure was used as a base for service delivery and that the Project modified, expanded and revitalized this system. But the basic rural health facility and health worker network was, and has continued to be, run and financed by the Ministry of Public Health. The costs of service delivery, even during the course of Project implementation, have been borne by the resources available within the provincial health care system. The great majority of outside donor funds were devoted to planning, managing, and evaluating the Project. Most of these costs incurred were start-up or nonrecurring costs. Included in the broad categories of Project-related expenditures were:

(1) Funds spent on planning curricula for the wechakorn, for the village volunteers, and for other types of manpower, as well as for writing training materials and implementing the training programs. (Such preparatory expenditures are not unique to the Lampang Project. The Ministry of Public Health in its preparation for training primary health care and other workers,

also invested much effort and funds in planning curricula, writing training materials and implementing training programs). Roughly 25% of the total Project budget funds went to various training functions.

(2) Planning and management of Project approaches and personnel (which included costs of administering Project funds, staff and equipment) accounted for a major portion of the outside Project budget. Such expenses would not be required normally in other areas, as no outside personnel or funds would be present. Most management supervision functions associated with health care delivery would be assumed by the provincial health office and its staff, as has already been done in other provinces.

(3) A major area in which Project funds were invested was Project evaluation. Evaluation accounted for well over 30% of the total outside Project funds, and was a need specific only to the Project. Except, perhaps, for the costs of monitoring volunteer performance, virtually all evaluation costs are considered ble, in that no such extensive activity would be required in other provinces undertaking similar types of rural health care activities. It is possible that the Ministry may wish to test and evaluate its own approaches, but the costs of the basic evaluation system used in Lampang would not be repeated.

The point must be emphasized that the costs specific to the Lampang Project were mostly nonreplicable start-up, overhead, and evaluation costs, and little of the outside donor funds was applied to rural health service delivery. Analysis of operational costs showed an overall increase in the funds spent on service delivery, but generally as a result of increased Ministry allocations for health care.

The Ministry of Public Health has launched a National Primary Health Care Program, along with other high-priority health programs. Whether these approaches are effective in improving coverage of the rural population and in meeting health care needs cost-effectively has not been assessed or documented in detail for other areas of Thailand. The Lampang lessons presented above may provide some insights into expected results.

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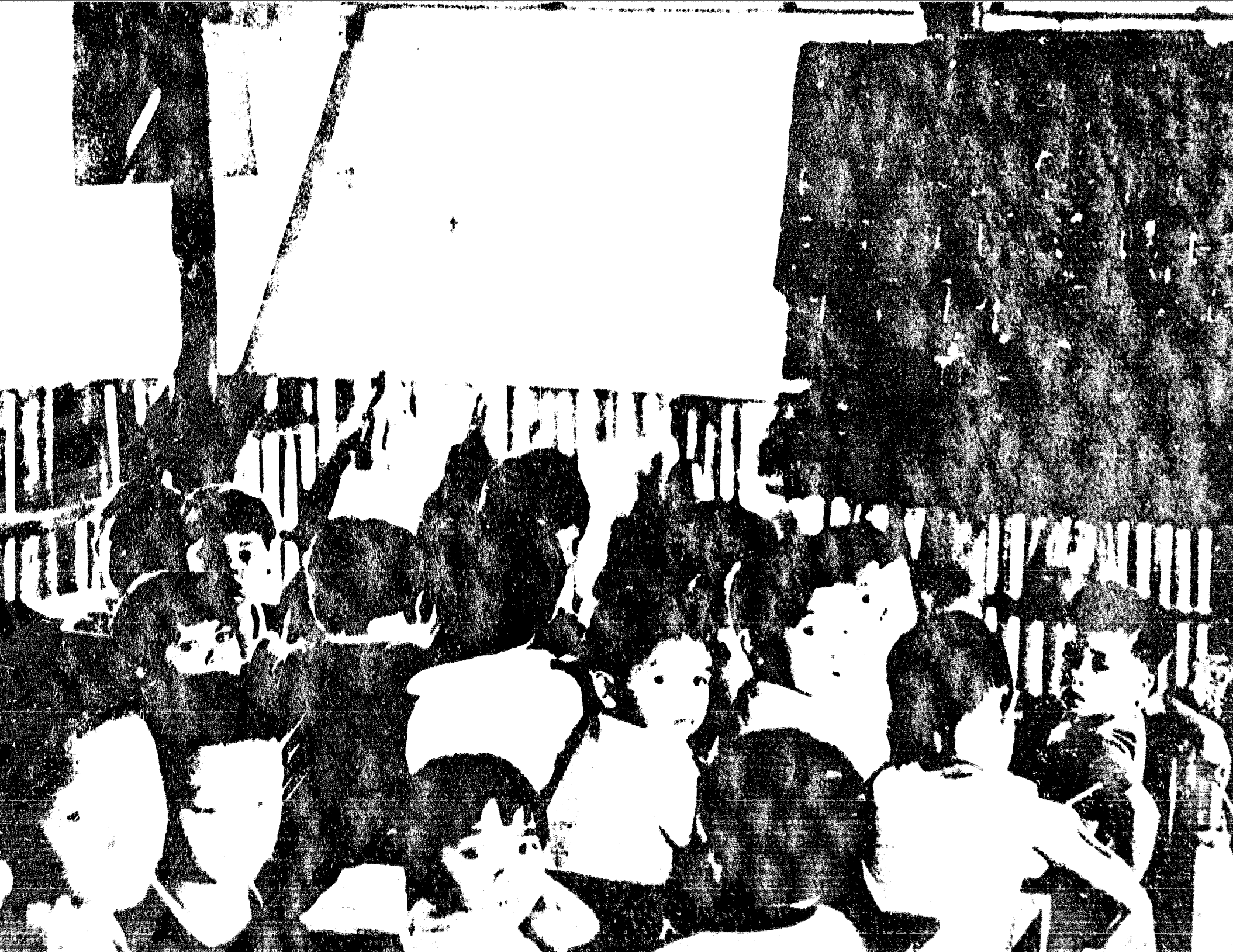

# IMPACT ON THE POPULATION'S HEALTH

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The overall goal of the Lampang Project was to increase health care coverage of the rural population, and more specifically, to reach at least two-thirds of the target women of childbearing age and children under age 6. The modification of the existing provincial health care delivery system together with the new approaches that were added were designed to attract the target groups to the system and serve them more effectively.

A basic assumption of the whole project design was that by improving coverage and service delivery to the target groups -- with emphasis on family planning, maternal and child health, and nutrition services -- a measurable improvement in the health status of the target groups would result. It is recognized that health status, fertility and infant mortality are strongly influenced by a variety of social and economic factors. Discerning the extent to which health services have had an impact on these factors is a complex task. In Lampang, there were several major problems associated with measuring impact on health status:

(1) The data available for measuring impact have often been too incomplete or qualitatively inadequate to be used to definitively measure change. This problem has been dealt with by drawing on several independent data sources wherever possible.

(2) The span of time during which Project-related approaches had been operating may have been too short to permit significant changes to occur. In only one district were Project approaches in operation for more than 3 years. In most other districts they operated for two years or less. Therefore, it may be somewhat unrealistic to expect dramatic changes in health-status indicators during such a brief intervention period.

(3) At the beginning of the Project, it appeared that important changes in some health-status measures, such as decreasing fertility, were already under way, and it may be difficult to unequivocally attribute observed changes directly to Project inputs. On the other hand, it may be that a lack of change in some key health-status indicators, such as child nutritional status, may be directly related to weaknesses in the depth and scope of project activities.

The Lampang Project has faced the common dilemma of matching well-documented service output results as indirect evidence of impact against more fragmentary direct evidence of health and fertility change. Previous monographs have demonstrated the project's impact on service availability, health facility and personnel performance and costs, and on utilization of health services by the rural population. These output results, coupled with Community Health Survey and vital statistics data, may suggest potential or putative change in health-status indicators resulting, in part, from Project activity.

## HEALTH STATUS MEASURES

The measures used to assess the change in health status of Lampang's rural population focus primarily on the health of the target group women of childbearing age and preschool children. However, some indicators of health in the overall population were also incorporated into the analysis (see "A System of Evaluation and Management Information for Rural Health Care", Monograph 6, Volume II of the Lampang Project Documentary Series). The measures proposed to analyze and compare changes in the population's health during the course of Project implementation were the following:

### Measures of Fertility

Changes occuring in the level of fertility in the Project and control areas were measured by estimating the:

(1) Crude birth rate (CBR) or the annual number of births per 1,000 population;

(2) General fertility rate (GFR) or the annual number of births per 1,000 women age 15-44; and

(3) Total fertility rate (TFR) or the summation of annual age-specific birth rates over the reproductive life of women age 15-44 years.

Although its limitations are recognized, a numerator-type analysis of the proportion of births by parity has also been included.

### Measures of Mortality and Morbidity

The primary measure of mortality in the population was the infant mortality (IMR), the ratio of infant deaths to total births. Observed changes in illness rates and the pattern of illness symptoms have also been analyzed.

## Measures of Nutritional Status

In addition to infant mortality, a major measure of child health status was nutritional status of preschool children. Weight-for-age and height-for-age were plotted for preschool children and later analyzed by both the Gomez and Waterlaw methods.

## Measures of Environmental Quality

Although not a direct measure of health status, environmental conditions, such as availability of water, treatment of drinking water, and presence of a privy may be closely associated with a large proportion of illness in the population. Therefore, change in these environmental conditions can suggest potential impact on the population's health.

## Other Measures of Potential Impact

Analysis of patterns of utilizing specific health services can also supplement assessment of health status measures. For example, changes in family planning practices are associated with fertility change. Changes in the level of prenatal and postnatal care coverage may have an impact on infant mortality. Whenever appropriate, a discussion of relevant service utilization patterns is coupled with the discussion of assessing the Project's impact on health status.

CHAPTER 1

# SOCIOECONOMIC PROFILE OF LAMPANG'S POPULATION

In both area and population, Lampang is a moderately large province in Thailand. Over half of the province's 12,000 square kilometer area is hills, and the large majority of its 650,000 population work as farmers in the valley lowlands. The major crops raised are glutinous rice, tobacco, peanuts, and sugar cane. Pineapple and other fruits are cultivated widely, depending on the season. There are a few irrigated areas, but most farming is dependent on the seasonal monsoon rains.

The population is predominately ethnic Thai, speaking the local dialect of standard Thai. There are sizable ethnic Chinese Thai minorities, mostly concentrated in Lampang municipality and district towns. There are also sizable non-Thai hilltribe minorities, estimated to number between 10,000 and 20,000, in some of the province's northern districts who were not included in the project surveys. The hilltribes live in the more isolated hill areas, and eke out a living raising subsistence crops. Table 1 summarizes the characteristics of the population surveyed.

Lampang was formerly the largest producer of teak and other hardwoods in Thailand and was an important regional center of timber trade. However, in recent years, timber production has been greatly reduced for two reasons. First, as is quickly apparent from a glance at the surrounding hills, much of the province's rich forests have been cut down. Secondly, in recent years the Thai government, in an effort to curtail the alarming rate of deforestation, has banned the cutting of timber. This change in the pattern of timber production has affected many villages economically. Earlier, cutting timber for personal use, for sale, and for producing charcoal and local handicraft was a major supplement to farming income.

As in other parts of Thailand, recent social and economic change has strongly affected the life of the rural farmers in Lampang. New lands to open for cultivation are difficult to find, and generally of marginal quality. The customary division of land among the family's children over successive generations has reduced the average family holding to a size insufficient to support large families of farmers. Cottage industries have become important sources of income supplementation;

Table 1

Selected Socioeconomic Characteristics of the Sample Groups: Community Health Survey[a]

| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
|---|---|---|---|---|---|---|---|---|
| | BL | FU | BL | FU | BL | FU | BL | FU |
| Sample households | 1,539 | 759 | 2,600 | 1,291 | 1,060 | 530 | 526 | 256 |
| Sample population | 8,841 | 4,166 | 13,760 | 6,571 | 6,270 | 2,948 | 2,950 | 1,308 |
| Household economic status: | | | | | | | | |
| % Poor | 25.5 | 28.2 | 17.7 | 30.2 | 19.6 | 27.5 | 32.0 | 35.9 |
| % Middle level | 70.3 | 66.4 | 76.3 | 64.4 | 76.6 | 66.6 | 66.7 | 59.8 |
| % Well-to-do | 4.2 | 5.4 | 6.0 | 5.4 | 3.8 | 5.9 | 1.3 | 4.3 |
| Main occupation: (those over age 10) | | | | | | | | |
| % Agriculture | - | 58.9 | - | 54.1 | - | 66.6 | - | 59.4 |
| % Labor (mostly farming) | | 15.9 | | 17.1 | | 11.3 | | 20.2 |
| % Trade or service | | 3.4 | | 6.0 | | 2.2 | | 2.7 |
| % Unemployed | | 11.2 | | 10.9 | | 5.6 | | 8.4 |
| % Other | | 10.6 | | 11.9 | | 14.3 | | 9.3 |
| Education completed (those age 15 and over) | | | | | | | | |
| % 0 | 22.3 | 19.1 | 26.7 | 25.4 | 29.9 | 28.7 | 19.9 | 17.3 |
| % 1-4 years | 67.3 | 65.3 | 61.0 | 60.8 | 63.0 | 62.6 | 71.0 | 70.3 |
| % 5 or more | 10.4 | 15.6 | 12.3 | 13.8 | 7.1 | 8.8 | 9.1 | 12.4 |
| % Literate (over age 10) | 80.3 | 79.1 | 75.1 | 73.9 | 73.2 | 71.3 | 83.4 | 81.2 |

[a] $E_1$, $C_1$, $C_2$ surveyed in 1975 and 1979, $E_2$ surveyed in 1977 and 1979

many farmers hire out as laborers in non-growing seasons; and many young people leave the land to seek work in Lampang town, other provinces, or in Bangkok. A sizable number of skilled laborers in several districts have also found jobs in the Middle East.

Lampang is located on the north-south rail line, and is the interchange point of several major national highways. It has therefore grown in importance as a regional center of trade and for the government bureaucracy. New construction and major physical changes in Lampang town have been continually observed during the period of Lampang Project operations. Changes at the village level, though more subtle, have also occurred that have potential long-term effects on the health

# CHAPTER 2

# CHANGES IN FERTILITY

## NATIONAL AND REGIONAL TRENDS

Evidence available from censuses, studies, and surveys conducted in recent years uniformly indicates that fertility in Thailand began declining gradually in the late 1960's and continued to decline more sharply through the 1970's. Current high levels of family planning practice have been influenced by the development and expansion of Thailand's broad-based National Family Planning Project. Both the increase in contraceptive practice and the decline in fertility have occurred primarily in urban areas, but they have been significant in rural areas as well.

Within Thailand's four major regions (south, central, northeast, and north), there appear to be substantial differences in the rate of fertility decline. The northeast and southern regions have exhibited relatively moderate declines, whereas the central and northern regions have demonstrated sharper rates of decline (National Academy of Science, pp. 1-3). The decline in marital fertility in the northern region, over 40% between 1964-65 and 1974-75, appears to be greater than in other regions. However, among the individual provinces of the north, there appear to be great variations in fertility. It has been suggested that much of the initial decline in fertility in the north was concentrated in two provinces, Chiang Mai and Lampoon, both of which are adjacent to Lampang (Parthaisong, 1978). But other studies indicate definite, although less dramatic, declines in fertility in other provinces (Shevasunt and Hogan, pp. 5-6; Suwanjata & Peerasit, 1979, p. 21).

During the period that fertility has declined sharply in Thailand, family planning activities have increased nationwide. Since the government initiated the National Family Planning Project in 1970, family planning services of all types including the IUD, oral pills, Depo Provera injections, and both male and female sterilization have been made widely available to married couples. A national contraceptive prevalence survey in 1978 found over 51% of currently married women practicing contraception; almost 49% of rural married women were practicing contraception. In the north, over 55% of rural married women were practicing contraception (Contraceptive Prevalence Survey, p. 38).

Significant family planning activities in the northern region preceded the introduction of the government program by several years. McCormick Hospital, a mission-supported hospital in Chiang Mai, began offering family planning services in 1963. and introduced the injectible Depo Provera in 1965. The hospital served a large proportion of married women in Chiang Mai and Lampoon provinces. Even after the government family planning program began, approximately half of all acceptors in Chiang Mai were served by the McCormick program.

## FERTILITY IN LAMPANG PROVINCE

Most evidence in Lampang, similar to national and regional indicators, suggests a significant decline in fertility since the mid-1970's. There are two major sources of data used in measuring fertility. The first is vital registration data provided by the provincial government's vital events reporting system. A problem with the system is that in practice, many births are recorded at the place they occur; with the increase in rural women using the provincial hospital for deliveries, the births are recorded in Lampang town rather than in their home districts. This makes inter-district comparisons difficult. The registration system is characterized by high levels of underreporting of births, estimated to be about 30% in the most recent (1974-1975) National Survey of Population Change. However, although the vital registration data cannot provide an assessment of fertility, it can provide a picture of overall trends in fertility.

The second major source of fertility data has been the pregnancy history segment of the Community Health Survey, conducted in 1975 and 1979 in the $E_1$, $C_1$, and $C_2$ districts, and in 1977 and 1979 in the $E_2$ area (see monograph 6 of volume II and monograph 7 of volume III for further discussion of the survey methodology). Any woman in the sample area who was between age 15 and 44 (49 in the baseline sample), and had ever been married, was interviewed concerning all children she had born, their birth dates, any deaths of those born, and pregnancies that were terminated before completion. There are a number of problems associated with pregnancy histories. They are subject to biases of sample size (which were particularly important in follow-up rounds for some areas where the number of sample women was small). The second major problem of pregnancy histories is the tendency of some women not to report incompleted pregnancies, births and child deaths, along with inaccuracies in recollection of dates and events.

An attempt to reduce the effects of the small number of events was made by averaging age-specific fertility rates over three years, and by computing three-year moving averages for other annual rates. Wherever comparable data are available on national, regional and provincial rates outside of Lampang, they are also presented for comparison with Lampang data.

## Changes in Marital Status

The number of women age 15 to 44 who are currently married has an important influence on fertility. As an initial step in reviewing fertility changes, current marital status of sample women in both baseline and follow-up surveys was compared. Table 2 summarizes current marital status data. The proportion of women currently married dropped significantly in all areas between baseline (BL) and follow-up (FU) surveys. The percent change in both Project operational areas was greater than in the $C_1$ control district in Lampang, but considerably less than in the control district outside of Lampang.

Table 2

Number and Proportion of Women Age 15-44 Currently Married, by Age Group and Area

| Area | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
|---|---|---|---|---|---|---|---|---|
| Survey[a] | BL | FU | BL | FU | BL | FU | BL | FU |
| No. women sampled age 15-44 | 1915 | 953 | 3083 | 871 | 1370 | 657 | 665 | 303 |
| No. currently married women in sample | 1058 | 466 | 1783 | 811 | 838 | 379 | 371 | 127 |
| Proportion (%) currently married in age group: 15-19 | 11.3 | 9.4 | 12.7 | 9.4 | 16.8 | 13.8 | 7.2 | 8.5 |
| 20-24 | 55.2 | 43.6 | 54.5 | 39.3 | 61.1 | 47.7 | 57.9 | 32.1 |
| 25-29 | 82.1 | 71.5 | 78.9 | 76.8 | 79.6 | 82.2 | 84.6 | 65.1 |
| 30-34 | 92.6 | 89.4 | 87.9 | 81.8 | 85.5 | 83.3 | 87.7 | 84.8 |
| 35-39 | 88.8 | 84.3 | 89.8 | 87.8 | 90.1 | 89.0 | 90.8 | 72.2 |
| 40-44 | 86.6 | 85.7 | 83.5 | 86.4 | 88.1 | 79.7 | 95.3 | 81.6 |
| 15-44 | 55.2 | 48.9 | 57.8 | 52.9 | 61.2 | 57.7 | 55.8 | 41.9 |
| % Change between BL and FU | -11.4 | | -8.5 | | -5.7 | | -24.9 | |

Source: Community Health Survey.

[a]BL = baseline survey; FU = follow-up survey. In Areas $E_1$, $C_1$, and $C_2$, four years elapsed between BL (1975) and FU (1979) surveys, while only two years elapsed between BL (1977) and FU (1979) surveys in Area $E_2$.

Pregnancy Status

Table 3 summarizes the change in the proportion of currently married women who were pregnant at the time of baseline and follow-up surveys. The proportion pregnant in the $E_1$ area increased slightly, while in the $E_2$ districts there was an 11%

Table 3

Proportion of Currently Married Women Pregnant at Time of Survey Interviews

| Area | % of Currently Married Women Pregnant | | |
|---|---|---|---|
| | Baseline | Follow-up | Percent Change |
| $E_1$ (BL-1975, FU-1979) | 6.7 | 6.9 | +3.0 |
| $E_2$ (BL-1977, FU-1979) | 7.3 | 6.5 | -11.0 |
| $C_1$ (BL-1975, FU-1979) | 4.5 | 7.1 | +57.8 |
| $C_2$ (BL-1975, FU-1979) | 4.0 | 7.1 | +77.5 |
| CPS[a](1978) | | 10.1 | |

[a] CPS = Thailand Contraceptive Prevalence Survey, 1978.

decrease. Both control areas showed very large increases. However, the percent of married women currently pregnant in all areas was considerably less than the proportion found by the national Contraceptive Prevalence Survey, conducted in late 1978. The project survey data on pregnancy should be used with caution, as the sample numbers involved, particularly in the follow-up rounds, are quite small.

Family Planning Practice

As discussed earlier in Monograph 8, Project survey data in the baseline rounds indicated very high levels of contraceptive use by married women of childbearing age. Moreover, the follow-up Community Health Survey conducted at the end of Project field implementation showed increased contraceptive practice in all areas, including the control districts. These changes are shown in Table 4. All areas showed considerable increases in the level of current contraceptive practice, although the control areas showed the most substantial change. All areas except the seven $E_2$ districts demonstrated levels of practice higher than found in the Contraceptive Prevalence Survey in the Northern region for roughly the same time. In all areas except the $C_1$ district, the sharpest increase in contraceptive practice was

Table 4

Contraceptive Practice of Currently Married Women, Age 15-44

| Age Group | % Currently Practicing Contraception | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
| | BL | FU | BL | FU | BL | FU | BL | FU |
| All 15-44 | 56.0 | 64.4 | 50.8 | 53.8 | 50.7 | 62.5 | 58.0 | 73.2 |
| 15-24 | 40.0 | 57.6 | 38.6 | 45.1 | 37.2 | 41.6 | 45.2 | 63.0 |
| 25-44 | 61.1 | 66.9 | 55.2 | 56.0 | 56.1 | 67.9 | 62.2 | 76.0 |
| % Change, ages 15-44 | +15.0 | | +5.9 | | +23.3 | | +26.2 | |
| % Change, ages 15-24 | +44.0 | | +16.8 | | +11.8 | | +39.4 | |
| % Change, ages 25-44 | +9.5 | | +1.4 | | +19.3 | | +25.2 | |

in the 15-24 age group, where fertility is heavily concentrated. (It should be noted that Mae Tha, the $C_2$ control district, is an unusual area with respect to fertility and family planning. Mae Tha is part of Lampoon Province, an area which is among those with the lowest birth rates and highest levels of contraceptive practice in Thailand.)

Crude Birth Rate

Provincial vital registration data for the period of Project implementation (1974-1979) show the trends in birth rates for the province summarized in Table 5. The number of births registered annually declined by 9.6%, whereas the population grew by only 3.1%. The birth registration data indicated a decline in the crude birth rate of 12.3% in the period 1974-1979. However, the substantial under-reporting of births, and the questionable reliability of the total population figures produced by the provincial vital registration office, make the data useful only for showing general trends in fertility. Although the law specifies that the residence of the child and not the place where delivery occurred be entered on the registration certificate, it appears that this practice is not always followed.

Table 5

Registered Births and Estimated Crude Birth Rates for Lampang Province, 1974-1979

| | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|
| No. registered births | 13,343 | 12,414 | 12,267 | 12,068 | 12,025 | 12,061 |
| Population | 636,580 | 643,001 | 643,260 | 648,639 | 652,528 | 655,993 |
| Est. Crude Birth Rate [a] | 20.96 | 19.31 | 19.07 | 18.61 | 18.43 | 18.39 |

[a] Births/1000 midyear population. Population was end of year, rather than mid-year figure.

Note: An underreporting rate of 30% was observed in the National Population Sample Survey, 1974-1975.

In recent years, as the number of births at the provincial hospital has increased, there has been a major increase in births registered for Lampang town. This suggests that many births of children from outlying districts which occurred in the hospital were simply recorded as town births. For example, although Lampang town has less than 7% of the total provincial population, over 38% of births in 1979 were registered in the town. As a result, the district breakdown of birth data from the provincial vital registration office is inadequate to make crude birth rate comparisons among districts.

## Fertility Rates

Using data generated by the pregnancy history component of the Community Health Survey, baseline and follow-up fertility rates were estimated. The changes in the general marital fertility rates -- the number of children born to 1000 currently married women age 15 to 44 -- are shown in Table 6. To produce sample sizes sufficient to calculate rates, three-year average rates were used. General marital fertility dropped substantially in all areas, but the greatest declines were in the two control areas. The decline in the $C_2$ control area was, however, over 50% larger than in any other area.

Table 6

Estimated General Fertility Rates,
Currently Married Women Age 15-44

| | | General Marital Fertility Rate[a] | % Change |
|---|---|---|---|
| $E_1$ | 1972-1974 | 137 | |
| | 1976-1978 | 116 | -15.3 |
| $E_2$ | 1974-1976 | 144 | |
| | 1976-1978 | 111 | -22.9 |
| $C_1$ | 1972-1974 | 131 | |
| | 1976-1978 | 99 | -24.4 |
| $C_2$ | 1972-1974 | 127 | |
| | 1976-1978 | 81 | -36.2 |
| CPS (North) 1978 | | 127 | |

[a]GFR = number of children born per 1000 currently married women.

Table 7 shows the change in age-specific marital fertility rates -- the annual number of births per 1000 married women in each age group -- and the total fertility rates -- the summation of the annual age-specific rates over the childbearing life of 1000 women (assuming the same age-specific rates held constant).

The average number of children born provides some supplementary evidence concerning changes in fertility, as shown in Table 8. Using the pregnancy history data for all ever-married women age 15-44, the average number of children born decreased markedly between the baseline and follow-up surveys. Since most older women in the sample have completed their families, the reduction in the average number of children ever born may reflect the decline in recent fertility of the younger women. As with the other fertility measures, the decline in the average number of children ever born has not been confined to only Project implementation areas.

## Table 7

Estimated Age-Specific Marital and Total Fertility Rates by Area

| Area | | Age-Specific Marital Fertility Rates | | | | | | Total Fertility Rate | % Change |
|---|---|---|---|---|---|---|---|---|---|
| | | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | | |
| $E_1$ | BL (1974) | 121 | 269 | 177 | 126 | 98 | 67 | 4,290 | -15.3 |
| | FU (1976-78) | 178 | 232 | 152 | 79 | 53 | 33 | 3,635 | |
| $E_2$ | BL (1976) | 274 | 280 | 142 | 81 | 65 | 22 | 4,320 | -24.7 |
| | FU (1976-78) | 65 | 276 | 153 | 70 | 56 | 31 | 3,255 | |
| $C_1$ | BL (1974) | 134 | 242 | 188 | 71 | 101 | 30 | 3,830 | -30.8 |
| | FU (1976-78) | 167 | 170 | 148 | 95 | 33 | 37 | 2,650 | |
| $C_2$ | BL (1974) | 188 | 181 | 182 | 91 | 80 | 58 | 4,205 | -39.5 |
| | FU (1976-78) | 100 | 137 | 83 | 95 | 51 | 43 | 2,545 | |
| | SOFT[a] (1975) | 70 | 220 | 220 | 180 | 170 | 80 | 4,550 | -20.2 |
| | CPS (1978) | 50 | 200 | 190 | 130 | 100 | 40 | 3,630 | |

[a]Survey of Fertility in Thailand.

## Table 8

Average Number of Children Ever Born to Ever-Married Women, and Children Still Living, Baseline and Follow-up Surveys

| | Area | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | | Chiang Mai 1977 |
| | BL | FU | BL | FU | BL | FU | BL | FU | |
| Children ever born to ever married women age 15-44 | 3.72[a] | 2.95 | 2.98 | 2.75 | 3.25 | 2.87 | 3.50 | 2.91 | 2.68 |
| % Change | -20.7 | | -7.7 | | -11.7 | | -16.9 | | |

[a]Estimate based on adding 30% to a-low for underreporting.

## Birth Order Analysis

Analysis of change in the proportion of births which are first, second or third births further supports the apparent decline in fertility. Table 9 shows the birth order distribution for the pre- and post-intervention periods in each area and round. This is a numerator-type analysis which is based on the assumption that as fertility declines, the proportion of births that are low birth orders (first, second, and third) will decline. As with other measures, three-year averages were utilized to reduce sampling error. In all areas, the proportion of births that were third order or less declined more than 10% with the largest decreases, 29% and 26%, occurring in the $E_1$ Project area and the $C_2$ control areas, respectively. There was a substantial decrease in the proportion of first and second order births in all but the $C_2$ area, with the greatest increases coming in the $E_1$ and $E_2$ areas.

Table 9

Percent Distribution of Births by Birth Order

| | Period | % 1st birth | % Change | % 1st + 2nd births | % Change | % 1st + 2nd + 3rd births | % Change |
|---|---|---|---|---|---|---|---|
| $E_1$ | 1972-1974 | 26.3 | | 48.1 | | 59.8 | |
| | 1977-1979 | 50.8 | +93% | 63.5 | +32% | 77.0 | +29% |
| $E_2$ | 1973-1974[a] | 30.3 | | 53.9 | | 65.2 | |
| | 1974-1976 | 33.3 | | 57.3 | | 71.2 | |
| | 1977-1979 | 35.1 | +16% | 66.2 | +23% | 81.1 | +24% |
| $C_1$ | 1972-1974 | 33.6 | | 56.1 | | 67.3 | |
| | 1977-1979 | 35.6 | + 6% | 62.1 | +11% | 77.0 | +14% |
| $C_2$ | 1972-1974 | 29.1 | | 41.4 | | 51.1 | |
| | 1977-1979 | 35.5 | +22% | 38.7 | + 7% | 64.5 | +26% |

[a] Estimated, as full data unavailable.

## FERTILITY TRENDS

All of the evidence presented in the previous sections produces a composite picture of declining fertility in Lampang. There appears to have been a definite decrease in the proportion of women currently married in most age groups of child-bearing women; there has been a concurrent increase in the proportion of married women currently practicing contraception, particularly in the age groups in which

childbearing is concentrated. Use of this type of measure has generated considerable controversy, and its limitations are recognized. However, it is used not on its own, but as an additional item in assembling a composite picture of fertility change. Virtually all other fertility measures strongly suggest that fertility was relatively low and declining when the Lampang Project began, and that it has continued to decline during the period of Project operations. This decline is similar to (though somewhat more pronounced than) trends in other areas of Thailand, in the region, and in neighboring provinces.

The impact on fertility that might be attributed to the Lampang Project appears to be minimal. That this might be the case was generally recognized early in the Project, when baseline fertility measures appeared low and declining. The fertility decline has been facilitated by a strong and expanding national family planning project that began in 1970 and which was already serving large numbers of rural women in both Project and control areas when the Project began. The trends in family planning and fertility in project operational districts were quite similar to those occurring in the control districts. In fact, the Mae Tha control district ($C_2$) outside of Lampang is a part of Lampoon Province, which has exhibited some of the lowest fertility rates and most extensive contraceptive practice in Thailand.

Although the Lampang Project did initiate new family planning activities, such as the mobile vasectomy team, volunteer distribution of oral contraceptives by village volunteers, and expansion of IUD and Depo Provera services by wechakorn paraphysicians, the activities were supplementary to an already active government program. Consequently, no clear impact on fertility, aside from trends already under way, can be discerned in the Project implementation areas.

# CHAPTER 3

# MATERNAL AND CHILD HEALTH

The data on service utilization collected during the Project Community Health Survey have indicated increased health service coverage of the project's main target groups, childbearing-age women and preschool children (discussed in detail in Monograph 8). Furthermore, when utilization of specific target sub-groups is examined, the improvement in coverage for some high-risk groups, such as pregnant women, is quite impressive. Some of the improvements in service delivery are confined to project operational areas, while others also occurred in the control areas Some types of target group services, including pre- and postnatal care, delivery care, and child immunizations, might be expected to have a direct influence on maternal and child health if the service quality and coverage are improved over an extended period. In addition, improved control over the timing and level of fertility might also be assumed to have, in the long term, benefits to both mothers and children. To assess the extent to which the health of women of childbearing age and preschool children was affected by project services, a number of measures were analyzed.

## MATERNAL HEALTH

Monograph 8 described the observed change in utilization of services by women of childbearing ages. These are summarized in Table 10. The data suggest improved maternity care in all areas, both intervention and control. Only for delivery care do data show the project areas to have made greater improvements (mostly a result of training traditional birth attendants). The measures related to maternal health are relatively modest, but may be reviewed in light of reported service utilization.

Table 10

Summary of Health Service Utilization by Women Age 15-44

| Service | % of Women Receiving Service | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
| | BL | FU | BL | FU | BL | FU | BL | FU |
| 1) For most recent delivery: | | | | | | | | |
| - Had prenatal care | 55.7 | 70.3 | 51.9 | 66.4 | 53.2 | 75.3 | 40.2 | 62.5 |
| - Delivered by trained attendant[a] | 44.0 | 88.1 | 41.8 | 78.3 | 31.9 | 42.5 | 30.9 | 45.8 |
| - Had postnatal care | 9.6 | 17.8 | 11.6 | 15.4 | 11.5 | 13.7 | 11.3 | 12.5 |
| 2) Currently practice FP | 56.0 | 64.4 | 50.8 | 53.8 | 50.7 | 62.5 | 58.0 | 73.2 |
| 3) Received government medical care in past year | 11.5 | 13.2 | 9.3 | 14.3 | 11.6 | 12.2 | 5.3 | 6.6 |
| 4) Received any government health service in past year | 36.2 | 44.7 | 30.1 | 45.0 | 40.7 | 42.8 | 30.1 | 43.6 |

a [a]In follow-up rounds, includes traditional birth attendants trained by Project only in Project implementation areas.

## Illness Experience

During the Community Health Survey all families were asked about illness episodes occurring the two weeks previous to the interview. Illness rates for women are summarized in Table 11. There appears to be a decline in the proportion of women ill in the $E_1$ and $C_1$ areas (a 29% decline and a 3% decline, respectively), whereas the proportion increased 40% in the $E_2$ area 45% in the $C_2$ area (roughly similar trends were apparent for the sample populations as a whole). It is difficul to draw any conclusions from these results, as no consistent pattern of change

Table 11

Percent of Women Age 15-44 Who Were Ill in the Two Weeks Previous to Interview

| | % of Group Ill | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_1$ | | $E_2$ | | $C_1$ | | $C_2$ | |
| | BL | FU | BL | FU | BL | FU | BL | FU |
| Whole population | 8.0 | 6.5 | 6.9 | 10.0 | 8.1 | 8.3 | 6.0 | 10.5 |
| Women age 15-44 | 7.2 | 5.1 | 5.7 | 8.0 | 9.0 | 8.7 | 4.7 | 8.6 |

appears in the baseline and follow-up illness rates. The uniformly higher rates of illness for women living in small households, suggesting an overrepresentation of illness in this group (discussed earlier in Monograph 8), suggests caution in reviewing Table 11.

Pregnancy Loss

The pregnancy history component of the Community Health Survey included a record of not only live births, but also of all pregnancies and their outcomes for each woman interviewed. The problems of recalling pregnancy losses -- miscarriages, stillbirths,and abortions -- are great, and the tendency to forget such events increases as time elapses. Also, the total number of pregnancies lost for the sample women was quite small, making potential sample error an important problem. Nevertheless, it is useful to review the data available. To reduce sample variability in Table 12, the project intervention areas have been pooled and the rates have been averaged over three years. The data suggest that there may have been a decline in pregnancy loss in the project areas, whereas the rate of pregnancy loss increased in the control areas. This can only be a tentative conclusion in light of the high potential for sample error. However, recognizing the problem of women's recall and resulting underreporting of such events, it appears that pregnancy loss has been quite high and remains so.

Table 12

Estimated Number of Pregnancies Ending in Stillbirth, Miscarriage, or Abortion per 1000 Pregnancies, for Women Age 15-44

| Area | Baseline (1972-1974)[a] | | Follow-up (1977-1979) | | % Increase/ Decrease |
|---|---|---|---|---|---|
| | No. Pregnancies | No. Cost/1000 Pregnancies | No. Pregnansies | No. Cost/1000 Pregnancies | |
| Project Intervention Areas | 1,073 | 82.9 | 371 | 62.0 | -20.9 |
| Control Areas | 503 | 61.6 | 127 | 86.6 | +20.0 |

[a]1973-1974 for the $E_2$ area.

## CHILD HEALTH

### Infant and Child Mortality

Measuring changes in infant mortality (the number of children who died before reaching one year of age per 1000 live births) proved to be much more difficult than expected. Deaths are highly underreported in the provincial vital registration system, and the proportion of underreporting is highest for infant and child deaths. This makes vital registration data generally useless.

Data concerning infant mortality and child loss were generated by the Community Health Survey, but as with fertility data, the numbers of events are quite small, the problems of potential sample error are great, and the problem of mothers' forgetting infant deaths is possibly equally important. Table 13 summarizes the Community Health Survey data on infant mortality, which have been pooled by Project and control area and averaged over three years to reduce sampling variability. If the rate of underreporting infant deaths in the pregnancy history is assumed to be at least 25% (although it is likely to be closer to 40% or 50%), the rates in the baseline period would be comparable to rates of 90-100 estimated for the Northern region (1974-1975) by the National Statistics Office. Although there appears to be a decrease in infant mortality in project areas, and an increase in the control areas, these data, because of the small sample numbers -- particularly in the follow-up period -- must be interpreted with care.

Table 13

Estimated Infant Mortality Rates (IMR)[a]

| Area | No. Births BL(1972-1974) | BL IMR | No. Births FU(1977-1979) | FU IMR |
|---|---|---|---|---|
| Project Intervention Areas | 984 | 52.8 | 348 | 34.5 |
| Control Areas | 471 | 61.6 | 116 | 51.7 |
| Chiang Mai[b] | | 69[c] | | 53[d] |

[a]IMR = No. infant deaths/1000 live births.
[b]Shevasunt and Hogan, p. 33.
[c]1968-1972.
[d]1973-1976.

Geven the weaknesses of vital registration data discussed above, direct measurement of infant mortality has not been possible. However, an indirect estimate of infant mortality can be derived from the pregnancy history analysis, which recorded all children born to women age 15-44, as well as the number of those children still living. This data is summarized in Table 14.

Infant and child mortality appears to be a common problem among women sampled. In every area, an average of between 11% and 14% of children ever born to these women had died by the time of the baseline interviews. In the follow-up period, the average proportion of children who died had declined to between 9% and 12% of all children ever born. The follow-up data appear roughly comparable to data for Chiang Mai in 1976-1977, although the number of children ever born in this latter area is lower than in any area where project data were collected.

The change in the average number and proportion of children who have died between the baseline and follow-up periods may be, in part, a result of declining mortality for children born in most recent years. However, the amount of decline is greatest in the two control areas, and there is little change in the project's $E_2$ districts (where less than two years separated baseline and follow-up data collection).

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Table 14

Average Number of Children Ever Born to Each Woman Age 15 to 44, and Average Number Still Living in Baseline and Follow-up Periods

| Area | | Av. No. Children Born[a] | Av. No. Still Living | % Deaths |
|---|---|---|---|---|
| $E_1$ | 1974 BL | 3.72 | 3.20 | 13.9 |
| | 1978 FU | 2.95 | 2.62 | 11.2 |
| $E_2$ | 1976 BL | 2.98 | 2.63 | 11.7 |
| | 1978 FU | 2.75 | 2.43 | 11.6 |
| $C_1$ | 1974 BL | 3.25 | 2.76 | 15.7 |
| | 1978 FU | 2.87 | 2.53 | 11.9 |
| $C_2$ | 1974 BL | 3.50 | 3.08 | 12.0 |
| | 1978 FU | 2.91 | 2.65 | 8.9 |
| Chiang Mai 1976-77[b] | | 2.68 | 2.38 | 11.2 |

[a] Children born per woman. [b] Shevasunt and Hogan, p. 29.

## Child Nutritional Status

The Community Health Survey included a component for assessing the nutritional status of all children under age 6 encountered in the household sample, using the Gomez weight-for-age classification as the primary measure. However, complete baseline and survey data are only available for the seven $E_2$ districts. Baseline nutrition surveys in the $E_1$, $C_1$, and $C_2$ intervention areas (as explained earlier in Monograph 6, Volume II) revealed problems of small sample size and sample bias which made the data unsuitable for analysis. Hence, the only extensive and complete set of nutrition data available is for the seven $E_2$ districts. Available nutrition data are summarized in Table 15. To provide some measure of change in the $E_1$ area, nutritional surveillance data collected in 1977 by health workers are compared with the survey data of 1979. The surveillance children were weighed with market scales, whereas children weighed in the project nutrition survey were weighed with a spring scale. Quality control of weighing procedures was more rigorous in the survey than during surveillance. Recording of children's ages in the nutrition survey was done after examination of birth documents, whereas only the parents' verbal report of age was used in the surveillance activities.

Table 15

Nutritional Status for Children Under Age 6:
Gomez Classification, NAS and Thai Standard

| Age Group/ Area | Baseline % | | | | Follow-up % (all areas, 1979) | | | |
|---|---|---|---|---|---|---|---|---|
| | n | Normal | $1^o$ | $2^o+3^o$ | n | Normal | $1^o$ | $2^o+3^o$ |
| NAS Standard [a] | | | | | | | | |
| $E_2$ 0-6 mos | 107 | 61.7 | 25.2 | 13.1 | 38 | 81.6 | 10.5 | 7.9 |
| 6-12 mos | 121 | 37.2 | 47.9 | 14.8 | 37 | 56.8 | 32.4 | 10.8 |
| 12-24 mos | 243 | 20.6 | 56.0 | 23.4 | 68 | 20.6 | 57.4 | 22.0 |
| 24-72 mos | 1,127 | 12.9 | 58.5 | 28.7 | 410 | 14.6 | 56.8 | 28.5 |
| Total | 1,598 | 19.1 | 55.1 | 25.8 | 553 | 22.8 | 52.1 | 25.1 |
| Thai Standard [b] | | | | | | | | |
| $E_2$ Age 60 mos or less | 1,328 | 45.4 | 44.1 | 10.5 | 451 | 48.8 | 43.7 | 7.6 |
| $E_1$ Age 60 mos or less | 2,885 | 37.3 | 43.9 | 18.9 | 295 | 42.9 | 44.4 | 12.7 |
| $C_1$ Age 60 mos or less | Not available | | | | 197 | 48.0 | 41.5 | 10.5 |
| $C_2$ Age 60 mos or less | Not available | | | | 153 | 47.1 | 43.1 | 9.8 |

[a] Standard used was 50% percentile of the US National Academy of Sciences standard. Baseline data are for 1977.

[b] Thai Ministry of Public Health standard, which is only available up to 60 months of age.

Note: $1^o$, $2^o$, and $3^o$ = first, second, and third degree undernutrition, respectively.

Nutritional status of children under age six, as measured against the National Academy of Sciences standard, indicates that over 25% of the children are in the most serious categories -- second and third degree undernutrition. Moreover, for the group as a whole there was a slight, but not significant improvement in their nutritional status in the follow-up period. There was, however, a substantial improvement in the nutritional status of the children under 12 months of age.

The proportion of children in the second and third degree categories, the most serious levels of undernutrition, decreased 5.2%, from 13.1% to 7.9%, for a proportionate reduction of 33%. The lack of change in the overall nutritional status of preschool children in the $E_2$ area is not surprising, as only slightly more than two years elapsed between the baseline and follow-up measures.

When the nutritional status of children aged 60 months or younger was measured against the Thai standard (constructed from a nationwide sample of Thai children), The results were somewhat different. Decreases in the levels of second and third degree undernutrition were substantial in both the $E_1$ and $E_2$ Project areas. There was a 27.6% proportionate decrease in the $E_2$ area and a 32.3% proportionate decrease in the $E_1$ area. Change in the $E_1$ area may appear greater than actual due to inaccurate age estimates used for the baseline surveillance data. Older ages than actual were recorded for children, which resulted in more children being placed in undernourished categories than should have been. Change in both control areas cannot be assessed because of the unavailability of baseline data. One can only state that the proportions of severely undernourished children in each control area are roughly the same as those in the Project intervention areas. However, without baseline data it cannot be ascertained whether or not levels of undernutrition changed over time in the control areas as they did in $E_1$ and $E_2$.

The apparent decrease in serious undernutrition in the $E_2$ area, as measured by the Thai standard, is somewhat surprising for two reasons. First, the period of time between baseline and follow-up nutrition surveys was only slightly over two years, and significant change might be considered unexpected in such a short time. Secondly, Lampang Project approaches were not fully operational in the $E_2$ districts until early 1979. Although the number of nutrition centers did increase somewhat the coverage of preschool children by the centers did not reach 10% in any area before 1979. It is possible that the village nutritional surveillance activities, coupled with the presence of village volunteers who have been trained to recognize the importance of nutritional problems, may have helped to stimulate families' recognition and prevention of nutritional problems. In the $E_1$ district, where nutrition activities were more intense over a five-year period, the combination of conventional nutrition approaches (CNC's) and Project-supported activities may also have influenced the apparent improvement in nutritional status. However, it is not possible to make comparisons with the control areas where valid baseline data are unavailable, nor can any of the available data show a direct link between change in nutritional status and specific Project interventions. Though nutritional status of preschool children may have improved, whether it was a result of Project-related activities or other factors in the environment cannot be clearly established.

## ENVIRONMENTAL HEALTH CONDITIONS

A number of conditions in the rural villager's immediate household environment may have important and direct effects on family health. Such factors as the availability and quality of water, treatment of drinking water, and availability of excreta disposal systems affect a family's exposure to some of the most common sources of illness and death: diarrhea and other gastrointestinal problems, typhoid fever, cholera, and parasitic infestations. For example, an unprotected well or untreated drinking water may be a direct source of a number of gastrointestinal infections. Puddles of waste water permitted to accumulate around the household compound become breeding places for flies and mosquitoes, which are responsible for the spread of a variety of diseases. Likewise, the unavailability of a privy for excreta disposal increases the potential for spread of agents causing diarrhea and parasitic diseases. Improving these conditions can have a direct impact on health. For example, project survey data indicate that from 85% to over 95% of all people ill with symptoms of diarrhea or gastrointestinal infection were concentrated in households with untreated drinking water whereas less than 15% of those who treated their drinking water suffered from such conditions. Changes in the environmental conditions that are associated with these health problems contribute to changes in the health status of the population.

The Project's Community Health Survey included questions concerning each household's source of water; whether drinking water was treated before use; how waste water was disposed of; and whether a privy for excreta disposal was present. The responses to these questions are summarized in Table 16. There appears to have been substantial improvement in every condition measured for the $E_1$ and $E_2$ project areas.

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Table 16

Household Environmental Conditions

| Environmental Condition | | Baseline %[a] | Follow-up %[b] | % Increase/Decrease |
|---|---|---|---|---|
| 1) Have covered[c] (protected) well | $E_1$ | 10.3 | 16.9 | +6.6 |
| | $E_2$ | 11.8 | 15.8 | +4.0 |
| | $C_1$ | 17.6 | 16.8 | -0.8 |
| | $C_2$ | 22.0 | 27.0 | +5.0 |
| 2) Use well water for drinking | $E_1$ | 98.0 | 97.8 | -0.2 |
| | $E_2$ | 73.4 | 77.5 | +4.1 |
| | $C_1$ | 79.2 | 71.0 | -8.2 |
| | $C_2$ | 94.0 | 92.6 | -1.4 |
| 3) Drinking water improved (by boiling, filtering, etc.) | $E_1$ | 10.2 | 13.6 | +3.4 |
| | $E_2$ | 15.8 | 18.7 | +2.9 |
| | $C_1$ | 8.3 | 5.7 | -2.6 |
| | $C_2$ | 7.8 | 13.3 | +5.5 |
| 4) System of waste water disposal present (drainage, etc.) | $E_1$ | 38.0 | 49.3 | +11.3 |
| | $E_2$ | 27.2 | 54.5 | +27.3 |
| | $C_1$ | 33.2 | 34.9 | +1.7 |
| | $C_2$ | 47.0 | 64.1 | +17.1 |
| 5) Excreta disposal (privy) present | $E_1$ | 44.0 | 55.9 | +11.9 |
| | $E_2$ | 61.3 | 71.1 | +9.8 |
| | $C_1$ | 51.3 | 62.1 | +10.8 |
| | $C_2$ | 41.3 | 55.1 | +13.8 |

[a] Baseline total households: $E_1$ = 1,539; $E_2$ = 2,600; $C_1$ = 1,060; $C_2$ = 526

[b] Follow-up total households: $E_1$ = 759; $E_2$ = 1,291; $C_1$ = 530; $C_2$ = 256

[c] Most households have wells (or access to one nearby), but few have a cover and pump.

Conditions measured in the $C_1$ control area within Lampang appear to have improved for waste water and excreta disposal, but condidtions have changed little or have declined for the other categories. Conditions in the $C_2$ control area, on the other hand, show a general improvement in household conditions which roughly matches the change in the $E_1$ and $E_2$ areas.

Some of the changes may be directly attributable to project activity. For example, in the $E_1$ area, a well improvement program begun in 1979, adding well covers and pumps to available wells and utilizing the support of village health volunteers, may explain the increase in covered wells in that area. Programs to improve the environmental condition are a routine responsibility of government rural health facilities in all areas. Improvements observed are no doubt related, in part, to the efforts of health workers in both the Project and control areas. In Project areas, as well as in the $C_2$ control area, the contribution of village health volunteers to the community-based program to improve environmental conditions may also account for the generally higher achievement in these areas.

# CHAPTER 5

## CONCLUSIONS AND IMPLICATIONS

Project staff have repeatedly pondered three major questions: Did the Lampang Project improve service coverage of the target groups of mothers and children? Did the Project delivery system do a better job of serving the health needs of the target groups than was done in non-project (control) areas? Can the service delivery achievements of the Project be clearly related to changes measured in the health of the population? These questions are generally subsumed in the crucial question currently being widely discussed in the international health community: Did the health interventions of the Lampang Project make a difference?

Clear answers to this question have worldwide importance in decision-making concerning alternative investments in health versus other social and economic development programs, and in discerning which health interventions have shown a proven capability to improve a population's health. Answers to the question are of equal consequence in Thailand, as the government has undertaken a major expansion and modification of the existing health care delivery system using approaches that in many ways resemble those used in Lampang.

It would have been gratifying to be able to report dramatic improvements in the Lampang population's health status which clearly resulted from Project-related activities, and which contrasted with non-project areas. Of equal importance, it would have been useful to be able to identify which Project interventions were linked to specific impacts on health. After a review of the findings presented in this monograph, it appears difficult to discern health status changes that were not already underway when the Project began and to differentiate between observed changes in health status in Project areas that differ from changes in control areas.

A variety of fertility measures have been presented in an attempt to overcome specific weaknesses of each individual measure and to construct a composite picture of fertility change. Most of these measures indicate that in Lampang, as in other parts of Thailand, fertlity has declined rapidly in recent years, a decline facilitated by changing marriage rates and the widespread practice of contraception. This, in itself, might be expected to affect the health of both mothers and children. Although there is some indication that infant and child mortality may be declining, these rates still appear to remain at relatively high levels, both in Project and control areas surveyed. Data concerning child nutritional status may provide a partial explanation. Although some improvement in child nutritional status is evident (though the data are not always consistent), the proportion of children found to be seriously undernourished still remained high during the follow-up surveys in both project and control areas. Moreover, although environmental conditions generally improved in the project areas, the fact remains that a large proportion of the population is not adequately protected by safe water supply and sanitation systems. The risk of illness from poor water and sanitation remains high.

Many resources and much effort have been spent to evaluate the Lampang Project results. A wide array of useful information and findings has been assembled concerning changes in the organization and operation of the modified health care delivery system and in the training and functioning of health workers within that system; the efficacy of utilizing non-physician practitioners and village health volunteers in health service delivery; changes in the costs of health delivery, and the impact of project-inspired changes on those costs; and, most important, the nature and pattern of response of the rural people to the changes introduced on their behalf.

The findings documented and presented here will be reviewed carefully by health leaders in Thailand at all levels as similar, large-scale activities rapidly expand throughout Thailand. Many outside of Thailand who have followed the Project's progress will also seek lessons from the Project's findings which they might apply to their own programs. It may be disappointing to may who have been awaiting an answer to the question: "Did the Lampang Project make a difference in the population's health status?" to find that the response remains ambiguous. This is also a disappointment to those who have been associated with the Project and who have spent time and effort in building the Lampang system and in making it operate effectively.

The results compel health workers to recognize that their efforts may only be one part of the range of social and economic factors that interplay to affect a population's health. Bur such a view may also undervalue the importance of the contribution that most health professionals believe effective health care can make. Given the detailed documentation concerning the health care system and what its workers have done over the years of the Lampang Project about the extent to which the population's health needs were served, a careful review suggests that programs could have been strengthened and shaped to more effectively reach those most in need, for example with improved nutrition programming. When one learns as much from what has not been accomplished as from what has been achieved, and when appropriate program adjustments in the system are made, one may see more clearly tha health interventions can make a difference.

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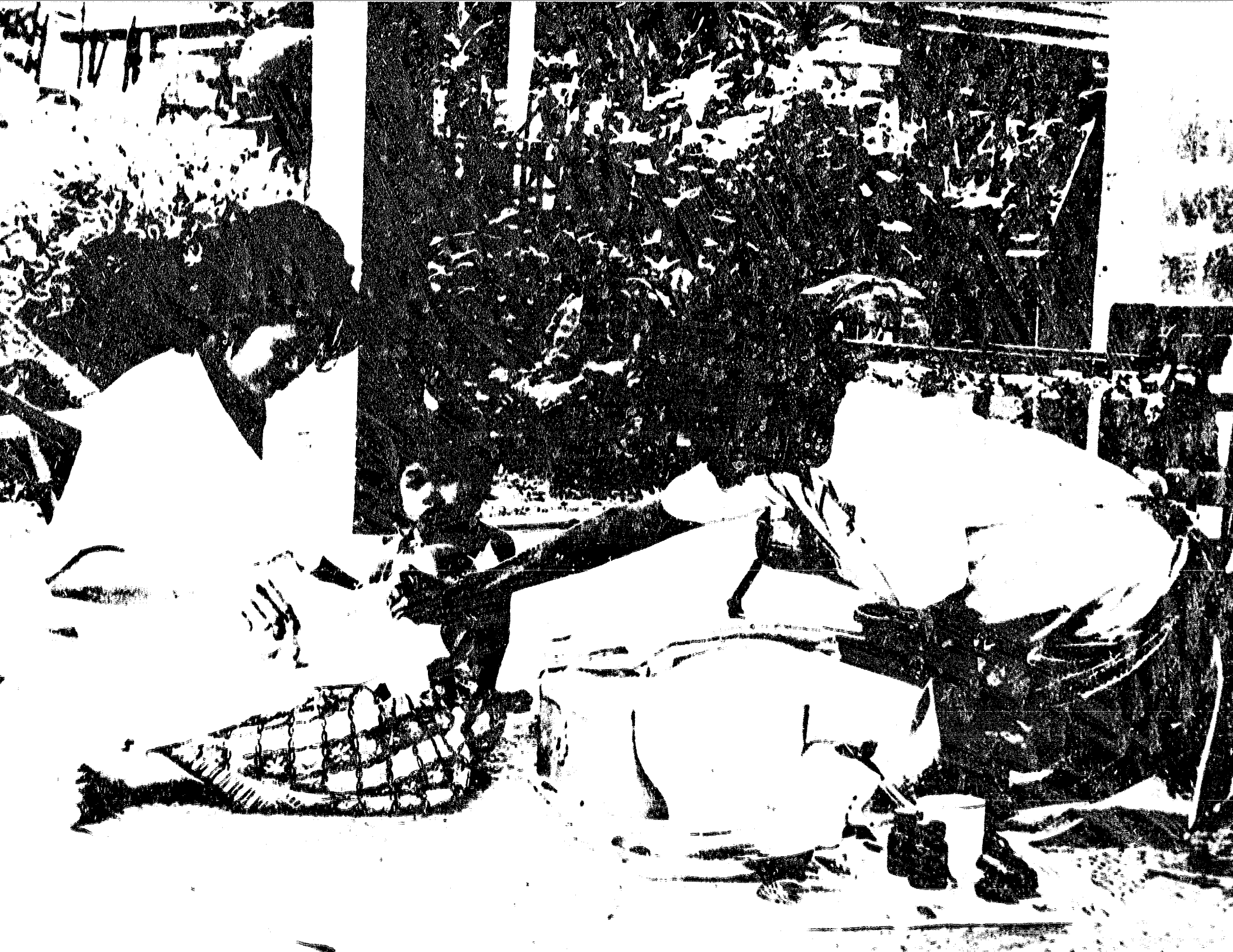

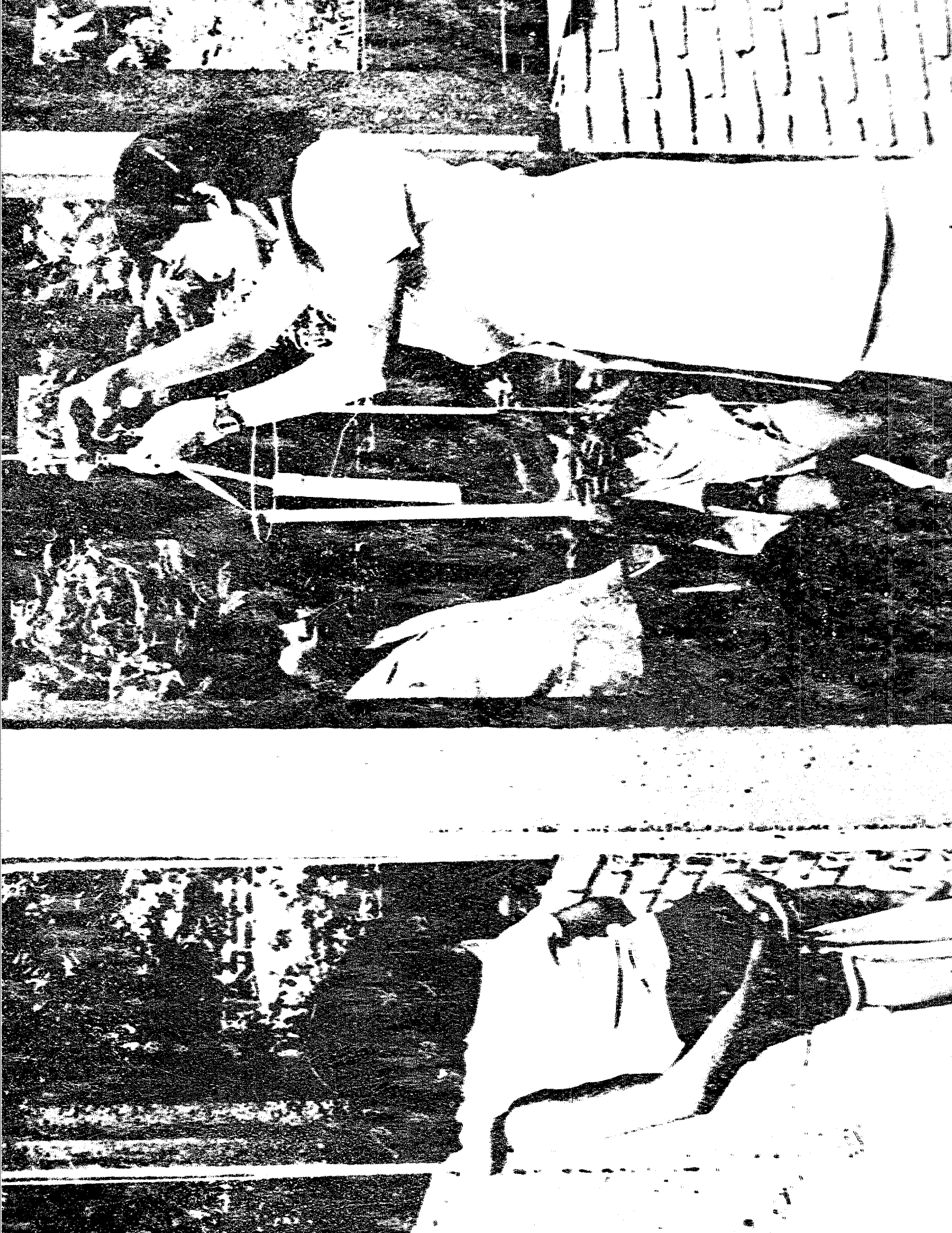

# FEASIBILITY AND AFFORDABILITY OF IMPLEMENTING THE LAMPANG SYSTEM'S KEY FEATURES NATIONWIDE: IMPLICATIONS FOR THE FUTURE

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> "... to build a workable and affordable primary health care system that will serve the great majority of needy rural residents is a considerably more complicated, time-consuming and expensive undertaking than is generally realized by those who have not actually tried. Nevertheless it has to be done, because this is undoubtedly the most effective and feasible way -- probably the only way -- to meet the crucial and long-neglected basic health needs of rural people. Whether it will be done is largely a question of each individual country's political priorities, and of the willingness of both the medical profession and the public health profession to cooperate fully in the effort." (Coombs, 1979)

While the previous three monographs have documented the change that has occurred over the life of the Project in terms of (1) accessibility and acceptance of health services, (2) the performance of health personnel and the costs and cost-effectiveness of the integrated health delivery system, and (3) the impact of these on the population's health, this monograph aims to consider these findings in the context of the national health care system and, specifically to address the Project's fourth Evaluation Objective:

> "To assess the social, administrative, and financial feasibility of replicating the key features of the Lampang Project Health Delivery System nationwide."

In reviewing early Project documents, two implicit assumptions are apparent: (1) if a demonstration project's key features and approaches are effective and their implementation costs low, then the feasibility of replication will be high; and (2) if a demonstration project can document a high feasibility of replication, then such key features and approaches tested in a demonstration project will, indeed, be "replicated". Inherent in these assumptions is an apparent belief in the validity of demonstration projects as an appropriate approach to foster improved health development. While the authors of this monograph do believe in the basic validity of demonstration projects, they feel the assumptions implied in early Project documents warrant scrutiny and further discussion.

The social and administrative feasibility of replication can be assessed, to a degree, within the confines of the Province of Lampang. The sequential nature of Project implementation, launching the key features first in a single district (Hang Chat) over a two year period, was, in effect, aimed at testing the social and administrative feasibility for extending the system further within the province. Refinements in key features and approaches were made as deemed necessary or appropriate, and they were then implemented, as modified, in other areas of Lampang. The social feasibility for this "replication" within Lampang was largely determined by the level of acceptance of the improved services by potential consumers. The administrative feasibility was determined, to an extent, by the acceptance of the Project's key features by administrators and health professionals, and by the capacity of the Provincial administration to manage and administer the greatly extended and expanded health delivery system.

However, to fully assess both the administrative and financial feasibility of replicating the Project's key features nationwide, an extensive review of the Ministry of Public Health's policies, plans and resources was required. This was conducted with the full cooperation of the Minister of Public Health and the Under-Secretary of State for Public Health, and it was accomplished through instrumental input of MOPH leaders in the Office of the Under-Secretary of State for Public Health, the Office of Primary Health Care, the Division of Training, the Division of Rural Health, and the Division of Planning. The authors are grateful for this continued cooperation and acknowledge the collaboration that continues to exist in the Lampang Health Development Project effort to provide a highly relevant experiential basis for future Ministry of Public Health planning.

# CONCEPTS OF FEASIBILITY, AFFORDABILITY, AND REPLICABILITY OF DEMONSTRATION PROJECTS

> "...to plan and build and manage a primary health care system successfully, it is vitally important to keep viewing it as a system of highly interdependent and mutually supporting parts that must be suitably linked to each other and to the surrounding social-economic-cultural milieu if the whole system is to function effectively. Regardless of how well any particular innovative feature may work in the context of a demonstration project, it cannot be expected to work equally well if plucked out separately and transplanted from the demonstration "system" to a quite different context -- unless great care is taken to adapt it properly to all the other components of the receiving system." (Coombs, 1979)

Planners of the parent "DIEDS Project" of APHA aimed to foster at least four demonstration projects in four or more different countries for the underlying purpose of developing and evaluating several integrated health services projects with the capacity to reach and serve the majority of potential consumers in their respective areas, and then to conduct a comparative analysis of the various "model delivery systems" in terms of their costs, impact, cost-effectiveness, and replication potential, both for their respective countries and -- more important to AID health assistance planners -- for other countries. Health professionals and health system evaluators from a number of U.S. institutions that were interested in participating considered the plan and drew attention to the difficulty of doing comparative analyses between countries in terms of costs, cost-effectiveness, and, particularly, "replicability" or the feasibility of replication. As mentioned in Monograph 1, Thailand was the only country that developed a "DEIDS" Project and, as a result, the scope of this type of evaluation in the "DEIDS/Thailand" (Lampang Health Development) Project was necessarily limited to the replication potential within the Thai national context.

## REPLICABILITY

The "replicability" of a demonstration project, or its feasibility for replication, can be considered in a number of ways. In a very general sense, it refers to the ability or demonstrated potential of the government (or another appropriate body) to incorporate the major elements or key features of the project into the

health care system of the country. In a very practical sense, it means that the costs of incorporating these elements into the national system -- and the costs of maintaining them -- must be affordable by the government, that is, to be financially (or economically) feasible. In practical terms, it also means that the methods used in implementation and maintenance of these features be appropriate, easily adopted (or adapted), and that they utilize technologies (for education and training, for health care, for management, and so on) that are easily applied by those using them and easily accepted by recipients. This is particularly relevant in a situation where health care consumers at the village level are trained to be health care providers at the village level.

## SOCIAL FEASIBILITY OF REPLICATION

The social feasibility of replication relates to the level of awareness among the community of the utility of the innovations, that is, the social value of the innovations. In the case of health care delivery systems, there must first be a perceived need (and demand) for the services that the health care system offers. This assumes a certain level of social awareness of the need, otherwise it would require creating a social awareness through such approaches as social marketing and innovative types of health education which can place a social (and personal) value on the services offered. As mentioned in Monograph 8, consumers' perceived needs for medical and health services may or may not match professionally identified needs or scientifically confirmed needs. But it is the consumers' perceived needs that are ultimately more directly linked to social acceptability and actual utilization of services than either professionally defined needs or scientifically confirmed needs. In health care delivery systems, more often than not, the social demand for services relates to medical care services for relief from conditions causing pain, suffering, and limitations on physical or mental functions, while that professionally defined may favor disease prevention and health promotion services. But it will be the social demand for services that influences more directly the actual levels of utilization of services offered. This raises an obvious advantage of integrated health services: while consumers come to receive curative services for relief from pain and suffering, they can benefit further by accepting other services such as immunizations, family planning, nutrition education, and so on, for which they may not come otherwise. The ultimate measurement of social acceptability is actual utilization of the services offered.

Social feasibility of replication can also be measured through surveys of public awareness (knowledge), attitudes, and actual acceptance, as well as consumer surveys to ascertain the levels and reasons for the acceptability of key features. The advantage of these methods is that specific information can be derived through surveys when survey instruments are carefully constructed, pretested, objectively used by impartial interviewers, and the results carefully analyzed. The disadvantage of this method is that it is generally quite expensive and time-consuming.

To the extent that the health delivery system involves community participation, such as the training of community health volunteers and the mobilization of village health committees, social feasibility for replication can be indicated by sustained levels of community health volunteer participation and continued involvement of the community after the initial enthusiasm has subsided. Another factor influencing the social feasibility of replicating features involving community participation is the application of appropriate methods and techniques for use by community members with limited education and training, the use of "appropriate technology" as it were.

## ADMINISTRATIVE FEASIBILITY OF REPLICATION

At the national level, consideration of the feasibility for "replication" of a demonstration project or, more specifically, the major elements and key features of the project, is generally focussed more on the financial and administrative feasibility of replication. Administrative feasibility is taken to mean the ease with which the key features of the project can be incorporated into the existing administrative system of the country and, specifically, the administration of the health care system. To assess administrative feasibility for replication would require extensive interviews with high-level administrators and influential leaders, as well as mid-level managers, carefully assessing their attitudes and accepted practices of relevance to the project elements under consideration. Experience has illustrated many times over that the more change that is required of an established system, the more difficult -- and the less feasible -- it will be to introduce the innovations. Many describe this phenomenon as "bureaucratic or administrative inertia". The ultimate indicator of the administrative feasibility for replication is administrative acceptance of the innovations to the extent that it becomes institutionalized, applied and accepted throughout the system.

## FINANCIAL FEASIBILITY OF REPLICATION

Financial feasibility, in simple terms, refers to the ability of the government to replicate the features of the system nationwide at an affordable cost. In the case of "low cost" health delivery systems with a capacity to reach and serve a majority of the people in need, where no more than 20% were reached formerly, "low cost" will not be taken mean that the overall system is, in absolute terms, cheaper than the former system. The term "low cost" is taken to mean that the cost per unit of service delivered is lower than in the previous system, that is that the system is operating more efficiently, more cost-effectively. In practical terms, the system is able to deliver more effective services (in both quality and volume) to more people in need of the services at a cost that is lower per unit service than before. Such concepts have been discussed in depth in Monograph 9, and will be discussed further in the following chapters. However, it is important to recognize at this juncture that the overall costs for extending services to more people, while lower in costs per service unit, will in fact be more expensive in absolute terms (with or without inflationary increases in costs). Further, the ultimate indicator of the financial feasibility for replication is the actual financial commitment of the government to finance the costs of replication.

## OTHER FACTORS AFFECTING REPLICABILITY

There have been many cases in which past demonstration projects have indicated a high level of social, administrative, and financial feasibility of replication, but the project was not replicated. Why not?

This question addresses the possible faulty assumption mentioned earlier: if a demonstration project can document a high feasibility of replication, then such key features and approaches tested in the demonstration project will indeed be "replicated". There are influencing factors to be considered other than the social, administrative and financial feasibility of replication.

The Lampang Health Development Project began operations in late 1974. The full implementation of the Project's key features was not completed until late 1979. And the evaluation activity, including an assessment of the financial, social and administrative feasibility of replication, was not completed until 1981. Yet many of the Project's key features were accepted and "replicated" -- implemented nationwide -- as early as 1977, long before the final results of the Project could be known. What factors were operating to facilitate the Ministry of Public Health's (and other RTG agencies') assessment of the Project (and of other projects still in the implementation phase), that the Ministry began planning for nationwide implementation of many of the Project's key features as early as 1977?

There were earlier projects for improving the delivery of rural health services in Thailand that had some features similar to those of the Lampang Project and which made substantial progress in the delivery of health services within the project areas. The methods used and the approaches undertaken were successful and there were clear indicators of social and financial feasibility of replication, but replication did not occur. Some of the projects were supported through (and some were directed by) bilateral or international assistance agencies and some were implemented by educational institutions within Thailand and supported by educational institutions and foundations from outside Thailand. The key features of these projects were largely successful, but not replicated nationwide. Why were they not replicated?

The Under-Secretary of State for Public Health and the Deputy Under-Secretary offer important observations in making their assessments of notable characteristic of the Project's development, planning and implementation that quite likely had a bearing on the acceptance of the Project's key features and on the replication of them throughout the rest of the country:

> "The Project was established and directed by the Thai Ministry of Public Health, the official RTG authority that would be responsible for nationwide implementation if the approaches and key features were found to be worthy of replication .
>
> "Project leaders developed and maintained a broad base of involvement of Ministry of Public Health leaders and other Royal Thai Government officials in all phases of project development, planning, implementation, and evaluation.
>
> "The Project welcomed and maintained a continuing dialogue on Project approaches and progress with both Thai and international health agencies by providing project information through periodic progress reports, organizing annual reviews, and by conducting special workshops and seminars for review and refinement of project approaches and key features.
>
> "The Lampang Health Development Project was viewed from the beginning as a Thai project: project planning and planners were predominantly Thai, project implementation and implementors were predominantly Thai, and project leadership and decision-makers were predominantly Thai.
>
> "Project administrative, managerial, and technical assistance.. ...was characterized by a spirit of genuine mutualism and colleaguial collaboration. Technical assistance was not limited to one institution, but involved a number of international organizations, U.S. and Thai institutions and agencies. Project leaders recognized that the project was dealing with a universal problem of how to achieve "health for all", and that this problem was best approached through broad collaboration and solid commitment, based on a spirit of mutualism and learning together." (Tuchinda, P. and Ningsanonda, P., 1981)

Clearly, other factors were also operating which facilitated the acceptance of Project approaches and nationwide implementation of many of the Project's key features. One of the most important was the increasing levels of awareness among government health leaders -- and political leaders -- of the necessity to rapidly extend health and other social services to the majority of the Thai population for obvious social development benefits and political stability of the nation. Following the political turmoil in Thailand during the early 1970's, there was a growing sense of immediacy to provide health and other social benefits more equitably throughout the nation and the apparent cost-effective approaches of the Lampang Project evidently had great appeal. Additionally, the primary health care movement found broad acceptance among international health and development circles which may have facilitated acceptance by Thai leaders of similar features of the project. The most important factor, however, may have been the emerging <u>political will</u> to facilitate rapid social and health development equitably across the entire nation.

Some of these factors will be tracked and explored further in the chapters to follow, but the point is made here that one cannot assume that replicability will necessarily ensue once social, administrative and financial feasibility of a project's approaches are shown. There are other factors operating -- <u>political will</u> being one of the most important -- and these factors may, or may not, be related to systematic studies of the feasibility of a project's approaches and key features.

# SOCIAL FEASIBILITY OF REPLICATION

> "The Ministry of Public Health has realized that there are untapped manpower resources existing in the villages....Those who are interested in health activities in the villages will help their neighbors and communities after they have been properly trained in simple medical care, disease prevention and health promotion. They can serve their communities and relieve the shortage of government health personnel in rural areas. Village health volunteers and village health communicators are volunteers who are willing to help their communities without any remuneration. They only expect a gain in recognition and respect from the villagers. This program will help the people by promoting community health services with community participation and the use of community resources." (Tuchinda, 1979)

The major indicators of social feasibility of nationwide implementation of Project key features are (1) increased rates of utilization (or acceptance) of health services in Lampang as measured by service statistics and community surveys, (2) increased selection of government health services as a first choice when medical and health care is sought as determined from community health surveys, (3) improved perceptions concerning government health care providers and health services as determined by consumer surveys, and (4) sustained villager participation in rural health care, as evidenced by high levels of performance and low levels of attrition of community health volunteers, and increased levels of community participation in high-priority local health programs.

## UTILIZATION OF GOVERNMENT HEALTH SERVICES

Public acceptance of government health services in Project areas as measured by actual utilization of services has increased since the earliest days of Project implementation and is continuing to increase. The greatest proportion of increase is at the periphery of the health care system, in the health centers and village health post services. These changes were documented and discussed in detail in Monograph 8. Changes occurring in health services coverage of the target population and the general population in Project areas from baseline years to 1979 are summarized in Table 1.

Table 1

Summary of Changes in Health Services Coverage of Target Populations and General Population in Lampang Project Areas (Baseline and follow-up)

| Type of Service Coverage \ Area | $E_1$ | | | $E_2$ | | | $C_1$ | | | $C_2$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline | Follow-up | % Increase/ Decrease | Baseline | Follow-up | % Increase/ Decrease | Baseline | Follow-up | % Increase/ Decrease | Baseline | Follow-up | % Increase/ Decrease |
| Coverage of Children under 6 with Child Health Service | 30.1% | 65.5% | +35.4% | 42.4% | 60.3% | +17.9% | 42.7% | 39.5% | -3.2% | 42.4% | 50.0% | +7.6% |
| Coverage of Deliveries by Trained Attendants | 44.0% | 88.1% | +44.1% | 41.8% | 78.3% | +36.5% | 31.9% | 42.5% | +10.6% | 30.9% | 45.8% | +14.9% |
| Coverage of Pregnant Women with Prenatal Care Services | 55.7% | 70.3% | +14.6% | 51.9% | 66.4% | +14.5% | 53.2% | 75.3% | +22.1% | 40.2% | 62.5% | +22.3% |
| Coverage of Mothers with Postnatal Care Services | 9.6% | 17.8% | +8.2% | 11.6% | 15.4% | +3.8% | 11.5% | 13.7% | +2.2% | 11.3% | 12.5% | +1.2% |
| Proportion of Currently Married Couples Practicing FP | 56.0% | 70.6% | +14.6% | 53.7% | 55.8% | +2.1% | 50.7% | 65.2% | +14.5% | 59.8% | 75.6% | +15.8% |
| Proportion of Contracepting Married Women Who Receive FP Service from CHS | 94.6% | 92.7% | -1.9% | 83.4% | 82.2% | -1.2% | 95.2% | 94.9% | -0.3% | 61.9% | 65.6% | +3.7% |
| Coverage of Target Group Women with Any Service | 36.2% | 44.7% | +8.5% | 30.1% | 45.0% | +14.9% | 40.7% | 42.8% | +2.1% | 30.1% | 43.6% | +13.5% |
| Coverage of Estimated Illness Episodes in General Population with Illness Care Services | 26.2% | 55.8% | +29.6% | 18.1% | 34.0% | +15.9% | 12.6% | 21.1% | +8.5% | NA | NA | NA |

Source: Community Health Surveys and Lampang Provincial Health Service Statistics.

FP = Family Planning

NA = Not Available

GHS = Government Health Service System (or Lampang Provincial Health Service System)

The acceptance of child health services in the various Project areas, represented by increased coverage of all children under age 6 years with child health services, is quite apparent in the first line of Table 1. The proportion of all children under age 6 who accepted child health services increased +35.4% in $E_1$ from 30.1% in the baseline survey (BL) to 65.5% in the follow-up (FU) survey; increased +17.9 in $E_2$ from 42.4% (BL) to 60.3% (FU); increased slightly (+7.6%) in $C_2$ from 42.4% (BL) to 50.0% (FU); but decreased (-3.2%) in $C_1$ from 42.7% (BL) to 39.5% (FU).

In a similar fashion, coverage of deliveries by trained attendants increased more in Project areas $E_1$ and $E_2$ than in $C_1$ and $C_2$ during the years observed. The increasing proportions of deliveries were attended by trained personnel of the Project. The coverage by trained personnel of deliveries in area $E_1$ increased +44.1% from 44% (BL) to 88.1% (FU); increased +36.5% in area $E_2$ from 41.8% (BL) to 78.3% (FU) ; while in Area $C_1$, the coverage of deliveries by trained personnel changed +10.6%, from 31.9% (BL)to only 42.5% (FU); and increased +14.9% in $C_2$ from 30.9% (BL) to 45.8% (FU).

The acceptance of prenatal care services by pregnant women was already substantial in all areas, ranging from 55.7% $E_1$ to 40.2% in $C_2$; it increased further in all areas to a high 75.3% in $C_1$ and to a low of 62.5% in $C_2$. Interestingly, although the highest levels of coverage were in $E_1$ (70.3%), $E_2$ (66.4%), and $C_1$ (75.3%), the greatest increases were observed in the $C_1$ and $C_2$ areas, +22.1% and +22.3% respectively. While the results appear somewhat mixed, possibly due to sampling error, there is clearly a definite increase in acceptance of prenatal care services in all areas.

The increased acceptance of post-natal care services in areas $E_1$ and $E_2$, +17.8% and +15.4% respectively, is trailed by lower levels of acceptance of post-natal care services in $C_1$ and $C_2$, +13.7%and +12.5%respectively.

While the proportion of married couples with wives age 15-44 years practicing family planning was already quite high when project operations began, ranging from 50.7% in $C_1$ to 59.8% in $C_2$, there was increased acceptance in all areas during the periods observed. The FP service coverage of married women increased 14.5% in $E_1$ from 56.0% to 70.6%; increased +2.1% in $E_2$ from 53.7% to 55.8%; increased +14.5% in $C_1$ from 50.7% to 65.2%; and increased +15.8% in $C_2$ from 59.8% to 75.6%. In all Project areas, a very high proportion of contracepting women received their FP services from government-sponsored sources: 93% in $E_2$, 95% in $C_1$ and 66% in $C_2$.

The overall acceptance by women age 15-44 years of government health services for women is reflected in Table 1. The proportion of all women of this age group who accepted government health services increased +8.5% in the $E_1$ area from 36.2% to 44.7%; increased +14.9% in the $E_2$ area from 30.1% to 45.0%; increased only slightly (2.1%) in $C_1$ from 40.7% to 42.8%; and increased +13.5% in $C_2$ from 30.1% to 43.6%.

The proportion of estimated illness episodes covered by government health services increased +29.6% from 26.2% to 55.8% in $E_1$; increased +15.9% from 18.1% to 34.0% in $E_2$; and increased +8.5% from 12.6% to 21.1% in the control area $C_1$ during the period observed.

The number of general illness care service contacts increased 29.6% to 55.8% in the $E_1$ area over five years; increased 15.9% to 34% in the $E_2$ area over three years; but increased only 8.5% to 21.1% over the four years observed in the $C_1$ control areas.

Reviewing Table 1 gives a general but clear impression of increased acceptance of government health services which is most marked in areas $E_1$ and $E_2$ for most types of services. In the $E_1$ areas, which had Project interventions in place over the longest period, the rate of increased acceptance of services is most pronounced, while the rate of change in $C_1$ and $C_2$ tended to be under +50% and was negative for some services. Five of the seven types of services measured in the $E_1$ area were accepted by more than 50% of the respective populations, and acceptance of five of the seven types of services measured in $E_1$ reached or surpassed the Project's target of 66%.

## CONSUMERS' PREFERENCES IN SEEKING HEALTH CARE

The data on acceptance of government health services for illness care presented in the previous section were derived from health service statistics at the Provincial Health Office and represent actual service contacts for illness care with respect to the estimated number of illness episodes. The governmental health service provided may have been the first choice of the consumer, or he/she may have come to governmental health facilities only after consulting other private sector providers. To gain more insight on the acceptability and acceptance of government health services to actual consumers of illness care services, the community health survey inquired of those who recently had been ill what was their first choice of provider for receiving illness care services. The results,were presented and discussed in Monograph 8, including a breakdown by type of provider, government health care providers,and private sector providers. These results illustrating the increasing acceptance of governmental health care services and the decreasing use of private-sector providers are summarized in Table 2.

Table 2

Consumers' Actual First Choice of Source of Health Care When Seeking Illness Care Services in Project Areas (Baseline and follow-up)

| Area | Government Health Service Providers | | | Private Sector Providers | | |
|---|---|---|---|---|---|---|
| | Baseline | Follow-up | %Change | Baseline | Follow-up | %Change |
| $E_1$ | 24.4% | 32.7% | +8.3% | 75.6% | 67.3% | -8.3% |
| $E_2$ | 16.2% | 28.6% | +12.4% | 83.8 | 71.4% | -12.4% |
| $C_1$ | 13.7% | 17.0% | +3.3% | 86.3% | 83.0% | -3.3% |
| $C_2$ | 16.4% | 16.0% | -0.4% | 83.6% | 84.0% | +0.4% |

Source: Community Health Surveys

The actual acceptance of government health service providers as a first choice of source of health care by consumers when ill has clearly increased in all Project areas within Lampang Province. The greatest increase has been observed in the $E_1$ and $E_2$ areas. There has been a corresponding decrease in selection of private-sector providers as a first choice of consumers who seek illness care services in areas $E_1$, $E_2$, and $C_1$, but there was a slight increase in use of private-sector providers as a first choice in the $C_2$ area.

## CONSUMERS' PERCEPTIONS OF GOVERNMENT HEALTH SERVICES

Various surveys conducted in Project areas of Lampang have indicated a reasonably high level of consumer satisfaction with government health services. One survey conducted in 1979 revealed that of 288 respondents in the survey, 95% had used government health services and 5% had not. Of the 95% that had used government health services, 96% expressed satisfaction, 2% were indifferent, and 2% were not satisfied. Of the 96% who expressed satisfaction, 15% were "very satisfied" and 81% were "satisfied". Of those who were "very satisfied", the reasons given for their satisfaction were distributed as follows: good treatment - 23%, good advice - 22%, good physical examination - 20%, good human relations- 27%, and frequent home visits- 8%. Of those who were "not satisfied", the reasons given for their dissatisfaction were distributed as follows: expensive - 64%, incompetency - 12%, poor human relations- 12%, and no advice given - 12%.

With particular reference to the medical and health services provided by the wechakorn paraphysicians serving in rural health facilities (health centers, midwifery centers, and district hospitals), consumers of wechakorn services reported the following: 26% felt wechakorn services were "very useful", 62% felt their services were "useful", 7% felt their services were "not useful" and 5% were "not sure".

When consumers of wechakorn dental health services were surveyed high levels of satisfaction were reported: of the 193 persons surveyed who had already use wechakorn dental health services, 91% were "satisfied", 2% were "not satisfied" and 7% were indifferent or did not respond.

In an effort to more carefully assess consumers' perceptions of government health services and, specifically, to permit consumers to assess government health services and to offer suggestions for improvements, the task and cost analysis conducted by NIDA surveyed 2,944 consumers of government health services in Project areas $E_1$, $E_2$, and $C_1$ in 1979. Of those surveyed in $E_1$, 41.6% were satisfied enough to say that no improvements were needed. Of those surveyed in $E_2$, 42.7% were satisfied and felt no improvements were needed. But in the $C_1$ area, only 9.2% felt no improvements were needed, 60.1% did not answer, and 31.5% offered suggestions for improvements.

Table 3

Consumers' Perceptions of Government Health Services in Lampang

| Consumer Perceptions and Suggestions for Improvements | $E_1$ | $E_2$ | $C_1$ |
|---|---|---|---|
| | % | % | % |
| No improvement required | 41.6 | 42.7 | 9.2 |
| There should be more personnel | 13.7 | 9.7 | 17.1 |
| Office hours should be adjusted | 8.4 | 4.0 | 9.0 |
| Medical equipment should be improved | 1.3 | 3.6 | 0.6 |
| Drugs and medical supplies not adequate | 2.8 | 3.0 | 2.6 |
| Fee adjustment needed | 0.6 | 5.1 | 0 |
| Building improvement needed | 2.2 | 3.5 | 2.2 |
| Personnel competence should be improved | 0.2 | 2.0 | 0 |
| Public relations and officials' manners need improvement | 0.9 | 1.0 | 0 |
| No answer | 28.5 | 25.6 | 60.1 |
| Total percent | 100.0 | 100.0 | 100.0 |
| | (n=466) | (n=1,969) | (n=509) |

For all areas, the most frequent suggestion for improvement was that more personnel should be added (9.7% to 17.1%). And 4% to 9% felt that office hours should be adjusted.

In the $E_1$ area, the highest levels of consumer satisfaction reported referred to district hospitals (74%) and midwifery centers (37%), but the level of satisfaction with health center services was substantially lower (18%). In the $E_2$ area, the level of satisfaction with district hospitals was high (55%), and the level of satisfaction with health centers (39%) and midwifery centers was a bit lower (36%). In the $C_1$ area, the level of satisfaction with health centers (6%) and with midwifery centers (16%) was substantially lower than in $E_1$ and $E_2$. (Note: the $C_1$ area had no district hospital.)

Table 4

Consumers' Perceptions of Government Health Services in the Six Districts of $E_2$, 1976 and 1979

| Suggestion | District Hospital | | Health Center | | Midwifery Center | | Total | |
|---|---|---|---|---|---|---|---|---|
| | 1976 | 1979 | 1976 | 1979 | 1976 | 1979 | 1976 | 1979 |
| | % | % | % | % | % | % | % | % |
| No improvement required | 8.37 | 54.88 | 7.68 | 38.76 | 9.26 | 35.75 | 8.10 | 42.66 |
| There should be more personnel | 3.77 | 12.71 | 15.03 | 9.18 | 11.40 | 6.42 | 13.19 | 9.65 |
| Office hours should be adjusted | 2.09 | 2.95 | 0.50 | 4.59 | 1.49 | 3.91 | 0.87 | 4.01 |
| Medical equipment should be improved | 4.60 | 6.63 | 3.37 | 2.90 | 4.13 | 1.12 | 3.65 | 3.61 |
| Drug and medical supplies not adequate | 2.93 | 0.18 | 5.52 | 4.78 | 6.78 | 1.68 | 5.58 | 2.95 |
| Fee needs adjustment | 4.60 | 7.37 | 1.88 | 4.87 | 2.64 | 2.23 | 2.30 | 5.08 |
| Building needs improvement | 8.79 | 2.95 | 14.81 | 3.65 | 20.99 | 3.63 | 15.67 | 3.45 |
| Personnel competence should be improved | 0.42 | 2.21 | 0.61 | 2.25 | 1.49 | 0.84 | 0.79 | 1.98 |
| Officials' manners and public relations need improvement | 16.32 | 1.66 | 11.05 | 0.94 | 10.25 | 0.28 | 11.31 | 1.02 |
| No answer | 48.12 | 8.47 | 39.56 | 17.88 | 31.57 | 44.13 | 38.51 | 25.60 |
| Total | 100.00 (n=239) | 100.00 (n=543) | 100.00 (n=1810) | 100.00 (n=1068) | 100.00 (n=605) | 100.00 (n=358) | 100.00 (n=2654) | 100.00 (n=1969) |

When these data are analyzed in more detail one notes many significant changes that have occurred over time from baseline to follow-up years, as seen in Table 4. The level of satisfaction with government health services in rural areas, as noted in the response "no improvement required", increased in the $E_2$ area from 8.1 % in 1976 to 42.7% in 1979, a rather substantial change. The magnitude of responses concerning the need for improvement decreased for the items "there should be more personnel", "drugs and supplies not adequate", "building needs improvement", and "officials' manners and public relations need improvement". These findings reflect substantial improvements in consumers' perceptions of the availability of health personnel, the availability of improved health facilities, and the accessibility of health services. A particularly important finding was that the government health care providers were practicing better public relations and manners with rural consumers of health services.

## SUSTAINED COMMUNITY PARTICIPATION IN RURAL HEALTH CARE

The social feasibility for replication of Project Key features can also be assessed by the levels of community participation in rural health care with particular reference to the levels of performance and the sustained participation of community health volunteers in the rural health care system.

Monograph 2 of Volume II documents the increasing volume of services that are provided by health post volunteers in Lampang. For example, the average number of FP and medical care contacts per health post volunteer increased from about 50 in $E_1$ in 1975 and from just over 50 in $E_2$ in 1977 to over 200 in both areas by 1979 (Ref. Figure 3, Monograph 2). In nine districts of Lampang in 1979, health post volunteers accounted for 62.9% of all contraceptive pill consumer contacts (80,200) and provided 41.4% of all contraceptive pill cycles distributed (88,610). During the years observed, there was a steady trend of increasing services provided by health post volunteers.

But can the level of health post volunteer participation in the provision of rural health care services be sustained? What has been the attrition of health post volunteers? The experience of many projects that have implemented programs based on volunteerism has been that volunteers may provide a high level of services for a short period but that voluntary contributions to programs are difficult to sustain. The general experience in these programs has been that within two years, up to 50% of volunteers (and frequently much more) have stopped participating. And the longer the period, the greater the level of attrition. Taken against this background experience, the finding in Lampang concerning the levels of attrition of health post volunteers has been quite surprising.

The overall rate of attrition of health post volunteers in ten districts of Lampang of the five years observed has been only 17.5%. And those that did drop out have been replaced through new training programs. When attrition rates are calculated on the basis of the number of years of service, the attrition rates range from 13.2% for two years service in $E_2$, to 19.2% for three years service in $E_2$, to 15.7% for five years service in $E_1$. There had been no attrition at all for the first year of service by health post volunteers in the $E_3$ area. Some suggest that the sustained contribution of health post volunteers relates to the increased social status enjoyed by the volunteers, to the increased "merit" earned (a not inconsequential factor in a Buddhist society), and, possibly for some, to the positive effects of the volunteerism role on their major occupation,e.g., shopkeepers who may sell more products when villagers come for health services

The high levels of performance of health post volunteers in the provision of village-based health services, particularly family planning and illness care services, and the sustained performance of health post volunteers as evidenced by these relatively low rates of attrition over the five years observed do, indeed, reflect a high level of social acceptance of these services and, therefore, social feasibility for replication.

Table 5

Health Post Volunteer Attrition Rates in Lampang
1975-1979

| Length of Volunteer Service | Number of Districts | Number HPVs Trained | No. HPVs Actually Working 12/79 | % Attrition |
|---|---|---|---|---|
| 5 years | 1 ($E_1$) | 89 | 75 | 15.7 |
| 3 years | 3 ($E_2$) | 255 | 206 | 19.2 |
| 2 years | 4 ($E_2$) | 243 | 211 | 13.2 |
| 1 year | 2 ($E_3$) | 162 | 162 | 0 |
| Overall for 5 years | 10 | 749 | 618 | 17.5 |

Source: Provincial Health Office and Lampang Project records

Beyond the sustained performance of health post volunteers, Project observers have noted the increasing levels of community and private sector participation in high-priority health programs. As documented in Monograph 2, substantial community and private sector involvement has developed in relation to the nutrition program, with particular reference to the construction of 161 new Child Nutrition Centers,

increasing the number from 11 in 1975 to 172 Child Nutrition Centers in 1980. In conjunction with the nutrition program, many communities developed demonstration gardens, fish ponds, and poultry and pig-raising projects. In some areas, substantial improvements in water sources were made through community participation. The participation of traditional birth attendants, drug sellers, and other indigenous providers also reflects social acceptance and adds to the social feasibility of replicating these features nationwide.

# CHAPTER 3

# ADMINISTRATIVE FEASIBILITY OF REPLICATION

> "The Government will expand rural health service facilities to cover all of the local administrative units within five years. In the meantime, the Government will improve efficiency of the health service delivery system through the concerted efforts of related sectors, Government agencies, and the general public. It will delegate more administrative authority and responsibility to provincial health administrations in order that it might better utilize available resources for the fulfillment of health needs and demands." (MOPH, 1980)

The administrative feasibility of replication of the Lampang Project's key features is already a fact, as the key features have been adopted, or appropriately adapted, for nationwide implementation. The major factors in the administrative feasibility of replication concerned the acceptance of the Project's key features by administrators and planners, measures to institutionalize these key features and to give them a legal and administrative basis for nationwide implementation, and the formulation of national policies and plans for nationwide implementation. This chapter will document and track the process of acceptance, adoption and adaptation of the Project's key features for nationwide implementation, including the formulation of a national policy and plan for nationwide implementation.

## ACCEPTANCE OF KEY FEATURES BY ADMINISTRATORS AND PLANNERS

Throughout the planning and implementation of the Lampang Project, broad-based MOPH and other RTG agency involvement was maintained. This occurred through such mechanisms as the Lampang Project Policy Committee; participation by senior Project staff of the Lampang Project in key MOPH committees, conferences, workshops and seminars on relevant subjects; field trip orientations for and discussions with MOPH officials, as well as with visitors to the Project from other RTG agencies and educational institutions; and, not least important, broadly attended Annual Reviews of the Lampang Project in which MOPH leaders and personnel participated with representatives of international and bilateral assistance agencies from within and outside of Thailand. These were important mechanisms for sharing Project progress and achievement and for evolving possible solutions to Project constraints and

encumbrances. A continuing dialogue was maintained informally at high MOPH and RTG levels by senior Project leaders concerning the key features and strategy of the Project to review achievements and problems as they occurred, and to feed relevant information directly to key MOPH leaders responsible for planning, implementing and managing the national governmental health care system. These processes for communicating relevant Project experience certainly had a greater impact on national planning than did the intended process of Project evaluation.

The Lampang Project was not the only project that provided important feedback to MOPH and other RTG planners. A number of projects, broadly classified as "health services research projects", were of great interest to alert MOPH and other RTG planners. A document produced by the MOPH in 1977 identified these projects as the following: the Pitsanuloke Project (1964-1968), the Saraphi Project (1968-1971), the Lampang Health Development Project (1974-1981), the Samerng Project (1977-1980), and the Songkhla Integrated Rural Development Project (1977-1980). The Korat Project was also instrumental in providing an additional experiential basis for planning. The point is made that no single project can justifiably be credited for the outcome of the evolving health development planning process at the MOPH and at the NESDB. The major credits for the outcome of national level planning should be properly shared by the leaders of these Projects who made the effort to effectively communicate the lessons that were rapidly accumulating from field experience and by top-level MOPH and RTG planners who were keenly interested in and particularly responsive to this field experience.

The 1975 and 1976 Annual Reviews of the Lampang Project (as well as subsequent Annual Reviews) were well attended by officials and key personnel of the MOPH and other RTG agencies. Provincial Health Officers and other provincial level officials from most other provinces in Thailand participated and shared experience gained in Lampang and other areas.

In 1977 the MOPH requested that the Lampang Project participate with MOPH leaders in the planning and implementation of a National Seminar on Primary Health Care which was subsequently conducted in Chiang Mai, Thailand, during September 1977. The Lampang Project responded with technical, administrative, financial and logistical support for the seminar which provided an important opportunity to facilitate dissemination of Project results and to foster national replication of the Project's key features which had been identified as primary health care approaches of direct relevance to the objectives of the seminar.

The 1977 First National Seminar on Primary Health Care was attended by 115 participants (and 6 observers) from all provinces of Thailand, including representatives from the MOPH, the Ministry of Interior, the Ministry of Agriculture and Cooperatives, the Ministry of Education, the Bureau of State Universities, the Office of the Prime Minister, the Ministry of Defense, the Thai Red Cross Society, the Community-Based Family Planning Services organization, the World Health Organization, the World Bank, UNICEF, the University of Hawaii, and USAID. Financial support for the seminar was provided by WHO, UNICEF, the MOPH, and the Lampang Project.

The outcome of the 1977 First National Seminar on Primary Health Care was instrumental in promoting primary health care as a key strategy for improving rural health services, in facilitating a continuing dialogue on these approaches, in sharing field experience, and in feeding this experience and the results of the seminar into the national health planning process. The participants of the seminar specifically recommended that: (1) the Government set forth a clear-cut policy concerning primary health care in order to create effective coordination between various public and private agencies, (2) a planning and coordinating committee comprised of concerned public and private sector representatives be established, (3) Government resources be rendered to various public and private agencies operating PHC activities, (4) principles of community development be used in PHC activities, (5) systems and methods of operation be established to provide support and facilitate communities' self-help activities, (6) coordination be established between various health institutions and PHC personnel and that cooperative efforts be fostered with charitable institutions and international organizations, (7) public and private institutions be motivated to better appreciate the importance of these approaches, especially among MOPH service personnel, to fully support PHC services, (8) agreement on a referral system be clarified among village volunteers, midwifery centers and health centers, (9) mobile medical units expand services to include health promotion, disease prevention, and support for PHC, and (10) additional seminars of PHC be conducted to share experience gained and to discuss problems of administration, implementation, and coordination. The First National Seminar on Primary Health Care was followed by a Second National Seminar on Primary Health Care about a year later which was again supported by WHO, UNICEF, the MOPH and the Lampang Health Development Project.

During the same period that the primary health care features of the Lampang Project were being considered and eventually accepted by administrators and planners, other key features of the Project were winning varying levels of

acceptance and were being adopted and/or adapted for broader application. As mentioned in earlier monographs, the concept of integrated health services was already well accepted and the provincial health administrations of each province had already concurred,at least in general terms. However, some of the methods for implementing integrated health services that were tested in Lampang received great interest by administrators and planners and eventually were adopted for nationwide implementation. One of these was the development in the Provincial Hospital of a Department of Community Medicine, described in detail in Monograph 4 of Volume II. Departments of Community Medicine in provincial hospitals are now being implemented nationwide. A streamlined provincial health information system was developed in Lampang that included data collection and reporting for the purpose of monitoring activity of village health volunteers, and this is now being developed further for nationwide implementation. Similarly, the emphasis on community participation and private sector involvement has been included in the formulation of plans for the Primary Health Care Programme.

One feature of the Lampang Project that was accepted in principle, but adapted substantially for nationwide implementation, was that of wechakorn paraphysicians. Administrators and planners agreed in principle with the concept of wechakorn paraphysicians but made substantial adaptations before implementing this feature nationwide. The apparent reasons for the adaptations concerned the views of some physicians in the MOPH and the Thai Medical Society that, while it would be acceptable to permit nurses to become nurse practitioners and to provide medical services, it was not so acceptable for nurse aides, midwives and sanitarians to be trained to provide such medical services. After the political and budgetary factors were considered, the nurse practitioner training was accepted by the MOPH and the NESDB, but training nurse aides, midwives and sanitarians to the same extent as nurse practitioners or wechakorn paraphysicians was not accepted. But there were other reasons for this decision which were elaborated by the Civil Service Commission and the Bureau of the Budget and primarily concerned the financial feasibility for replication of the wechakorn paraphysician training program. Pay increases and/or promotions are generally granted to personnel who undergo additional training of one year or more. The wechakorn training program was a full year and graduates of the program received salary increases and additional benefits following the training.

Winning BOB and CSC support for increasing salary and benefits for wechakorn in Lampang was a process that took over two years, reflecting the reluctance of these administrators and planners to implement the program nationwide because of

the implications that this would have on their budgets. Also, with a training program that takes a full year to complete, there is substantial loss of service time at former rural health assignments, necessitating reassignment of personnel to cover those facilities. On the national level, new personnel would probably be required, which would have serious budgetary implications. After a dialogue that lasted over a year among administrators and planners of the MOPH, BOB, CSC, and NESDB, the decision (or compromise) made was to implement training in medical care for health workers at rural health centers -- including midwives, sanitarians, and nurse aides -- but the training program would be a short course of 3 to 6 months. This would not require troublesome budgetary reallocations and, yet, it could promote the development and improvement of clinical care services in rural health facilities. If the training program was found to be too short to meet the demand for clinical care services, then retraining could be conducted by provincial health authorities. A review of the lessons learned in Lampang that may have significance to the national program is presented in Monograph 3 (Volume II) and in Monograph 12, the summary final report (Volume I).

## FORMULATION OF POLICY AND PLAN FOR NATIONWIDE IMPLEMENTATION

The Ministry of Public Health formulated a policy on primary health care and launched the national Primary Health Care Program in 1977, the first year of Thailand's Fourth Five-Year National Economic and Social Development Plan. The general objectives of the national Primary Health Care Program were stated as follows: (1) to expand the coverage of health services, particularly among underserved rural populations, as quickly as possible, and to help the people to help themselves, (2) to utilize community resources and to encourage community participation in order to solve individual health problems and eventually to establish a self-help program at the village level, (3) to promote the dissemination of health information to local people, as well as to integrate all the data that will reflect the needs and health problems of communities, (4) to make basic health services available, accessible and acceptable to the people, and (5) to decrease malpractice, especially in medical care.

In September, 1978, Thailand participated in the International Conference on Primary Health Care, sponsored by WHO and UNICEF, and conducted in Alma Ata, USSR. Following this conference, the Ministry of Public Health formulated recommendations and a policy statement that was then submitted to the Cabinet of the Royal Thai Government for consideration.

On March 23, 1979, the Cabinet of the Royal Thai Government approved the principle of primary health care as a National Health Development Policy and supported the allocation of resources and administrative mechanisms to ensure the achievement of program objectives. (Tuchinda, 1979/November).

In November, 1979, the Royal Thai Government approved primary health care as the Twentieth Program of the Fourth National Social and Economic Development Plan for 1977-1981 (Desawadi, 1980). Given the Government mandate to proceed rapidly in the implementation of primary health care, the MOPH established an Office of Primary Health Care within the Office of the Under-Secretary, and appointed Dr. Pricha Desawasdi, Field Director of the Lampang Health Development Project, as Director of the Office of Primary Health Care.

CHAPTER 4

# FINANCIAL FEASIBILITY OF REPLICATION: THAILAND'S NATIONAL SOCIAL AND HEALTH DEVELOPMENT POLICIES AND PLANS FOR 1977-1981 AND FOR 1982-1986

> "Thailand's action plan on health development is already in harmony with 'health for all by the year 2000'. Programs have been undertaken within the framework of Primary Health Care which concentrate on basic manpower development with emphasis on wider coverage of the rural population, comprising primarily village health volunteers and communicators, supplemented by local healers, traditional birth attendants and traditional practitioners. By the end of this year (1981) the program is expected to cover 22,400 villages -- or 50% of Thailand's rural population. By 1986, all rural villages will be covered, and 12,000 local health supervisiors will have been trained.
>
> Apart from a national health development network, key health-related sectors are included in multi-focus planning and coordinating bodies...Medical schools, the Medical Council, and training institutions for medical auxiliaries have cooperated in re-orienting their curricula to include Primary Health Care concepts and approaches." (Tuchinda, 1981/July)

A major indicator of the administrative feasibility of replicating the key features of the Lampang Project is the formulation of a national policy and plan that incorporates these key features, as appropriately adapted to the national situation; and the ultimate indicator of the financial feasibility of replication is, in very practical terms, the actual financing and implementation of these respective elements of the national policy and plan. This chapter will document the progress made in national implementation of the MOPH policy and plan, focussing on the elements that have been adopted or adapted from key features of the Lampang Project. The monograph will then review the costs of some of these elements of the national plan and document, in real terms, their actual financial feasibility of replication.

During the period 1977-1979, the Ministry of Public Health invited several Lampang Project senior staff to participate in various policy formulation, planning and implementation activities, with particular reference to the National Primary Health Care Program; the training and support of village health volunteers and

health communicators, the training of nurse practitioners, the training of sub-district health personnel in clinical care, district-level health services management training, village-oriented health programs for improved water supply, nutritional surveillance and community nutrition improvement services, and the treatment and control of infant and child diarrheal disease. While documentation of all of these inputs from the Lampang Project is beyond the scope of this monograph, this chapter will document many of the contributions of the Lampang Project to national health development and the many achievements of the Ministry of Public Health in policy formulation, in health and development planning, and in national implementation of these priority programs for health development.

## INTEGRATED HEALTH SERVICES

> "National Health Policy:
> The Government will provide preventive, promotive, curative and rehabilitative health services in an integrated fashion and will emphasize services to the rural population who are severely underserved." (Ministry of Public Health, Thailand, 1980)

The statement above comes from the Fourth Development Plan (1977-1981) and summarizes the MOPH policy on integrated preventive, promotive, curative and rehabilitative health services which was conceptualized and formulated in the early 1970's. At that time the MOPH was itself undergoing an extensive reorganization to better promote integrated health services and to streamline the line of authority within the MOPH's national health administration. Two major features were being implemented when the Lampang Project began operations in 1974: first, at the central level, the Office of the Under-Secretary of State for Public Health had been delegated line authority for the entire rural health administration (and the MOPH's various departments were, therefore, largely technical departments to advise and support the Office of the Under-Secretary in its responsibility and authority for rural health administration); and, at the provincial level, the newly established position of "Provincial Chief Medical Officer" brought all health facilities and manpower under a single administration, bringing to an end the two administrations that had formerly been under the Provincial Hospital Director and the Provincial Health Officer. This policy facilitated the work of the Lampang Project in its effort to functionally integrate health services in the Province through such approaches as the following: (1) creation of a Department of Community Medicine in the Provincial Hospital which initiated and still operates a rural health-medical mobile unit for provision of integrated health services in remote areas, including vasectomy and other family planning services, nutrition

services, medical care services, immunizations, health education; (2) training midwives, sanitarians, nurses, and nurse aides in clinical care and public health services for provision of integrated health services at all village midwifery centers, subdistrict health centers and district hospitals; (3) training community health volunteers and establishing a primary health care network in every village for provision of a limited range of integrated health services at the village level. Each of these approaches is now being promoted in Thailand's Fifth Five-Year Development Plan for 1982-1986.

The MOPH aims, and is already implementing a plan, to establish a Department of Community Health in every provincial hospital in the nation, following the pattern set by Thailand's first Department of Community Health in a Provincial Hospital which was established in Lampang by the Lampang Health Development Project in 1975. The Lampang Provincial Hospital's Department of Community Health gained wide recognition, beyond its favorable reviews during the Lampang Project's Annual Reviews, when it launched a highly successful vasectomy program that placed Lampang highest in the nation for the number of vasectomy acceptors. The Department of Community Health also initiated and supervised rural nutritional surveillance and nutrition improvement programs, coordinated medical and health services for health post volunteers who came to the Provincial Hospital for care, coordinated hospital physician rotations to district hospitals and mobile clinics, organized educational activities for hospital clinics and wards, and conducted a number of other activities described further in Monograph 4.

The functional integration of health services through community health volunteers and paraphysician manpower development has also been strongly promoted by the MOPH in both the Fourth and Fifth Five-Year Development Plans. These programs are described in the following sections on the National Primary Health Care Program in Thailand. A discussion of the training of midwives, sanitarians, and nurse practitioners or paraphysicians for provision of integrated health services in all rural health centers and district hospitals throughout Thailand also follows.

## THE NATIONAL PRIMARY HEALTH CARE PROGRAM

> "In 1977, the Ministry of Public Health launched the Primary Health Care Program...In March, 1979, the Cabinet approved the principle of Primary Health Care as a National Health Development Policy...." (Tuchinda, 1979)

## Evolution of the National PHC Program

The National Primary Health Care Program in Thailand evolved in a step-by-step fashion over a number of years. As described in Monograph 1, village health post volunteers and health communicators in Thailand were trained first in the Saraphi Project in Chiang Mai during the period 1968 to 1971. This experience was brought into the planning of the Lampang Project and some key personnel of the Saraphi Project were assigned to the Lampang Project planning activity in 1972 and to the implementation activity when operations began in 1974. By 1977, the MOPH formulated a policy on Primary Health Care and launched a nationwide program for the training of village health volunteers and village health communicators under a plan that would cover all rural villages in the nation within ten years. In 1978, the MOPH recruited the Lampang Project's first Field Director, Dr. Pricha Desawadi, to assist in developing a detailed plan for organizing and implementing a National Primary Health Care Program. When a Primary Health Care Unit was created in the Office of the Under-Secretary of State for Public Health, Dr. Pricha Desawadi was appointed Director. Thus, the experience that Dr. Pricha had gained in the Saraphi Project and the Lampang Health Development Project was translated in real terms into the planning and implementation of the National Primary Health Care Program.

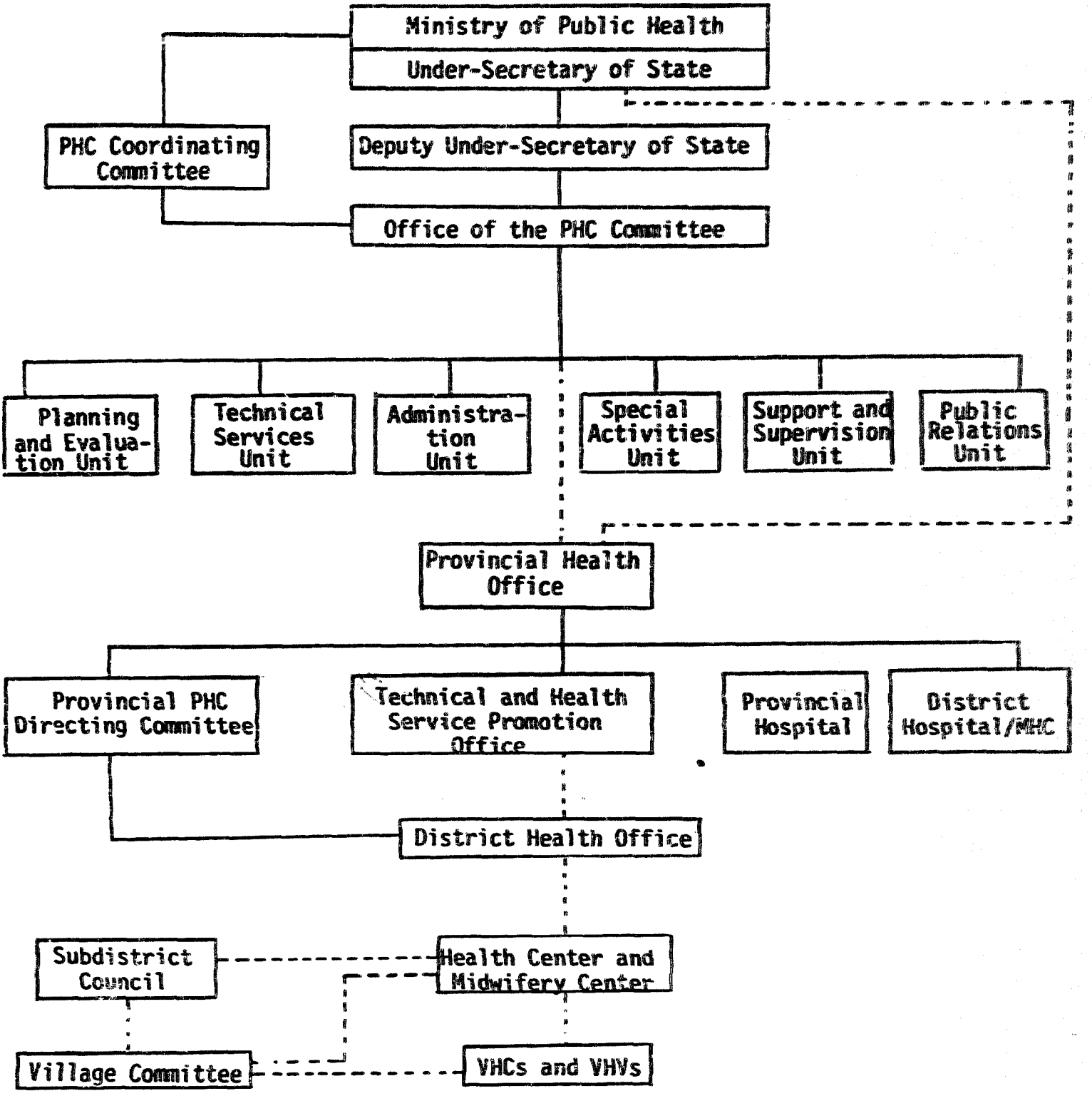
During the period of 1977 to 1979, the MOPH planned and implemented two National Primary Health Care Seminars which drew upon the experience and staff of the Lampang Project. The first National Seminar on Primary Health Care won broad acceptance of the basic concepts and approaches of PHC, and the second National Seminar on Primary Health Care, in December 1979, specified the priority program elements for Primary Health Care in Thailand, as follows: (1) health education, (2) control of local endemic diseases, (3) maternal and child health, (4) immunizations for prevention of communicable diseases, (5) provision of essential drugs, (6) treatment of common diseases, (7) nutrition promotion, (8) sanitation and safe water supply, (9) treatment of drug abuse, (10) mental health care, (11) dental health care.

## Organization of the National Primary Health Care Program

Given the need for the National Primary Health Care Program to be implemented with a high degree of coordination within the Ministry of Public Health and with the cooperation of various other sectors and agencies of the RTG, the Ministry of Public Health created a Division of Primary Health Care within the Office of the Under-Secretary of State for Public Health. The Office of Primary Health Care

Figure 1

Organization of the PHC Program



operates and coordinates the PHC program with the assistance and guidance of two standing committees at the central level, the PHC Coordinating Committee and the PHC Directing Committee.

The PHC Coordinating Committee is chaired by the Minister of Public Health and its membership includes the following. Under-Secretary of State for Public Health; Deputy Under-Secretary of State for Public Health; Director General of the Department of Health; Director General of the Department of Medical Services; Director General of the Department of Communicable Diseases Control; Director General of the Department of Medical Science, Chief Inspector General; Director of the Health Planning Division; Director of the Provincial Hospital Division; Director of the Rural Health Services Division; Director of the Health Education Division; Director of the Primary Health Care Division; representatives of concerned organizations, e.g., Internal Security Command (Ministry of Defense), Community Development Department (Ministry of Interior), Non-Formal Education Department (Ministry of Education); representatives of private organizations concerned, e.g., Community-Based Family Planning Services. The major role of the PHC Coordinating Committee is to give advice to the MOPH on policy formulation, implementation, coordination, and resolution of problems.

The major role of the PHC Directing Committee is to develop strategies for implementation and to control and direct all activities concerned with coordination, planning, training, follow-up support, research and public relations of the PHC Program. The Directing Committee is chaired by the Deputy Under-Secretary of State for Public Health and its membership includes the following: Deputy Director General (DDG) of the Department of Health, DDG of the Department of Communicable Diseases Control, DDG of the Department of Medical Science, DDG of the Department of Medical Services, Chief of the Inspector General Office, Director of the Health Planning Division, Director of the Rural Health Services Division, Director of the Provincial Hospital Division, Director of the Health Education Division, Director of the Health Training Division, and the Director of the Primary Health Care Office.

At the provincial level, a Provincial PHC Directing Committee is established for the purpose of developing operational guidelines appropriate for the respective province, formulating a provincial plan of operations, and controlling and directing the PHC activities including training, follow-up support, research, public relations, evaluation and coordination. The Governor of the province appoints the committee. The chairman is the Provincial Health Officer and its members include the Provincial Hospital Director, the Chief of the Community Medicine Department of the Provincial

Hospital, the Chiefs of Sections of the Provincial Health Office, Chief Nurse of the Provincial Hospital, the Directors of District Hospitals, and District Health Officers. The Provincial Health Officer establishes a PHC Coordinating Unit in any appropriate section of the Provincial Health Office, and assigns appropriate staff with functions concerning PHC planning, research and evaluation, training and public relations, and follow-up support and supervision.

Local primary health care activities are coordinated by the subdistrict council and the village health committees.

PHC Targets and Achievements Under the Fourth Development Plan (1977-1981)

Under the Fourth Five-Year National Economic and Social Development Plan for 1977-1981, the Ministry of Public Health launched the National Primary Health Care Program with a major effort to train village health volunteers and village health communicators in all 72 provinces of Thailand, except Bangkok which already had adequate medical and health facilities and Lampang which already had the Lampang Health Development Project. The Office of Primary Health Care, therefore, was charged with responsibility for coordinating the implementation of primary health care in a total of 70 provinces.

The overall strategy called for training a corps of MOPH trainers who would conduct training in each province, following a sequential pattern of implementation that would launch the program in 23 provinces in 1977, another 25 provinces in 1978, and another 22 provinces in 1979. The provinces included in this plan of implementation are listed in Table 6. Each of these provinces would initially launch the training program in one or two pilot districts (following the LHDP implementation plan where the program was launched first in single district, Hang Chat), and in subsequent years the program would be extended to all districts of the province. This implementation plan would permit the greatest area and population coverage in the shortest period.

Table 7 presents the area and population coverage targets of the National Primary Health Care Program, and Table 8 presents the training targets of the National Primary Health Care Program for the 1977-1981 period of the Fourth Five-Year National Economic and Social Development Plan.

Table 6

Sequence for Implementation of Village Health Volunteer and Village Health Communicator Training Under National PHC Program

| 1977-1981 | 1978-1981 | 1979-1981 |
|---|---|---|
| 1. Khon Kaen | 1. Kalasin | 1. Krabi |
| 2. Chon Buri | 2. Kanchana Buri | 2. Chanthaburi |
| 3. Chieng Mai | 3. Kam Phang Phet | 3. Chachoengsao |
| 4. Nakhon Phanom | 4. Chai Phum | 4. Chai Nat |
| 5. Nakhon Ratchasima | 5. Trang | 5. Chum Phon |
| 6. Nakhon Si Thamarat | 6. Tak | 6. Trad |
| 7. Nan | 7. Nakhon Pathom | 7. Nakhon Nayok |
| 8. Pattani | 8. Nakhon Sawan | 8. Nonthaburi |
| 9. Phisanuloke | 9. Narathiwas | 9. Pathum Thani |
| 10. Phrae | 10. Buriram | 10. Ayuthya |
| 11. Mae Hong Son | 11. Prachuab Khirikhan | 11. Phang Nga |
| 12. Yasothon | 12. Prachin Buri | 12. Phu Ket |
| 13. Yala | 13. Phatalung | 13. Ra Nong |
| 14. Ratcha Buri | 14. Phichit | 14. Ra Yong |
| 15. Loei | 15. Phetchaburi | 15. Samut Prakan |
| 16. Si Sa Ket | 16. Phetchabun | 16. Samut Songkhran |
| 17. Sakon Nakhon | 17. Maha Sarakham | 17. Samut Sakhon |
| 18. Song Khla | 18. Roi Et | 18. Sing Buri |
| 19. Satul | 19. Lop Buri | 19. Ang Thong |
| 20. Sara Buri | 20. Lampoon | 20. Uthai Thani |
| 21. Surin | 21. Sukhonthai | 21. Chiang Rai |
| 22. Udon Thani | 22. Suphan Buri | 22. Phayao |
| 23. Ubon Ratchathani | 23. Surat Thani | |
| | 24. Nong Khai | |
| | 25. Utradit | |

Source: Primary Health Care Project, 1978-1981. Office of the Primary Health Care Committee, revised July 1980. Ministry of Public Health, Thailand.

Ministry of Public Health leaders reported this year (1981) that the training targets and the area and population targets of the National Primary Health Care Program have largely been met. Before the end of 1981, nearly 50% of all villages in Thailand that are in areas outside of cities, towns, and subdistricts with health centers will be covered by trained village health volunteers and village health communicators.

The specific levels of achievement of the National Primary Health Care Program during the 1977-1981 Fourth Five-Year National Economic and Social Development Plan are presented in Table 9.

Table 7

Area and Population Coverage Targets
of the National Primary Health Care Program
For 1977-1981

| Area and Population Coverage | 1977 | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|---|
| 1) Area | | | | | |
| - Provinces | 23 | 48 | 68 | 68 | 70 |
| - Districts | 240 | 493 | 620 | 620 | 638 |
| - Subdistricts | 240 | 1,800 | 4,100 | 4,800 | 4,800 |
| - Villages | 2,000 | 7,100 | 12,200 | 17,300 | 22,400 |
| 2) Population, million | 1.6 | 5.9 | 10.1 | 14.8 | 18.5 |

Source: Primary Health Care Project. Office of the PHC Committee, Ministry of Public Health, Thailand, July 1980.

Table 8

Training Targets of the National
Primary Health Care Program
For 1977-1981

| Items | No. of Trainees | | | | | Total |
|---|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 | |
| 1) Central Trainers | 35 | - | - | - | - | 35 |
| 2) Provincial/District Training | 463 | 634 | 320 | - | - | 1,417 |
| 3) Subdistrict Training | 555 | 3,600 | 5,000 | 1,600 | - | 10,755 |
| 4) VHCs | 20,000 | 51,000 | 51,000 | 51,000 | 51,000 | 224,000 |
| 5) VHVs | 2,000 | 5,100 | 5,100 | 5,100 | 5,100 | 22,400 |

Source: Primary Health Care Project, Office of the PHC Committee, Ministry

Table 9

Coverage, Training Targets and Achievements of the Primary Health Care Program, Ministry of Public Health (Fourth 5-Year Development Plan ), 1977-1981

| | 1977 | | 1978 | | 1979 | | 1980 | | 1981 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Target | Achieved | Target | Achieved | Target | Achieved | Target | Achieved | Target | Achieved | Target | Achieved |
| **Cumulative Area Coverage:** | | | | | | | | | | | | |
| Provinces | 23 | 23 | 48 | 48 | 68 | 68 | 68 | 68 | 70 | 70 | 70 | 70 |
| Districts | 240 | 240 | 493 | 493 | 620 | 620 | 620 | 620 | 638 | 638 | 638 | 638 |
| Subdistricts | 240 | 240 | 1,800 | 1,800 | 4,100 | 4,100 | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 |
| Villages | 2,000 | 1,912 | 7,100 | 6,870 | 12,200 | 11,735 | 17,300 | 16,409 | 22,400 | 21,509 | 22,400 | 21,509 |
| **Training of:** | | | | | | | | | | | | |
| MOPH Trainers | 35 | 35 | - | - | - | - | - | - | - | - | 35 | 35 |
| Provincial & Dist. Trainers | 463 | 450 | 634 | 712 | 320 | 527 | - | - | - | 62 | 1,417 | 1,751 |
| Subdistrict Trainers | 555 | 582 | 3,600 | 3,202 | 5,000 | 4,018 | 1,600 | 1,302 | - | 788 | 10,755 | 9,892 |
| Village Health Communicators | 20,000 | 17,609 | 51,000 | 47,198 | 51,000 | 48,549 | 51,000 | 50,120 | 51,000 | 50,130 | 224,000 | 213,606 |
| Village Health Volunteers | 2,000 | 1,912 | 5,100 | 4,958 | 5,100 | 4,865 | 5,100 | 4,674 | 5,100 | 5,100 | 22,400 | 21,509 |
| Cumulative Population Covered (Millions) | 1.62 | 1.54 | 5.89 | 5.70 | 10.10 | 9.71 | 14.82 | 14.06 | 18.46 | 17.73 | 18.46 | 17.73 |

Source: Office of the Primary Health Care Committee, Ministry of Public Health, Thailand, September 1981.

The achievements of the National Primary Health Care Program in its first five years of activity are quite remarkable. All 70 provinces in the program have launched training activities for development of village health volunteers and village health communicators to serve in all 638 districts of these provinces. As of 1981, all 4,800 subdistricts in the 638 districts (of these 70 provinces) have VHV/VHC for some 21,509 villages with a total population of over 18 million village residents. This represents 40% of Thailand's total population and 50% of the Thai population residing outside of cities, towns, or subdistricts with health centers. This has been achieved already, and the remainder of the rural Thai population (and the urban poor) will be covered by the National Primary Health Care Program in the next five years, 1982-1986.

PHC Targets Under the Fifth Five-Year Development Plan (1982-1986)

Current plans of the MOPH and the NESDB for the Fifth Five-Year Economic and Social Development Plan, 1982-1986, will carry the National Primary Health Care Program to every rural village and urban slum in Thailand and effectively cover a population of over 48,000,000 residents. The specific targets for implementation of the MOPH's "Regular Plan on PHC" during the Fifth Five-Year Development Plan are presented in Table 10.

The National Primary Health Care Program has been given a very high priority by the NESDB and by the Cabinet of the RTG. Beyond the "Regular Plan" and targets which are presented in Table 10, in 1980 the RTG appropriated a special budget ($3,589,448 for two years, 1982 and 1983) for the accelerated implementation of the National Primary Health Care Program in Thailand's poorest, most underserved rural villages and urban slums. The accelerated "Plan for Poor Areas" was formulated with targets established for 1982 and 1983, as presented in Table 11. The rapid implementation of the "Plan for Poor Areas" and the Regular Plan for implementation of Primary Health Care will jointly cover 36,100,000 population by the end of 1983, more than doubling the population covered in the first five years of the National Primary Health Care Program!

Given the excellent record of the MOPH in reaching (or nearly reaching) PHC targets for the 1977-1981 development period, and given the high priority placed on the PHC Program in the 1982-1986 development period, as well as the special budget provided for acceleration of implementation for the poorest areas during 1982-1983, the successful implementation of the program nationwide by the end of the Fifth Five-Year Development Plan is almost certain. It would be useful at this point to assess the costs of this ten-year effort and, to the extent possible, to document the various means of financing the National Primary Health Care Program.

Table 10

Targets of the Ministry of Public Health for the Fifth 5-Year Development Plan (Regular Plan), 1982-1986

| | 1982 | 1983 | 1984 | 1985 | 1986 | Total |
|---|---|---|---|---|---|---|
| PHC Program Area Coverage: | | | | | | |
| Districts (cumulative) | 638 | 638 | 638 | 638 | 638 | 638 |
| Subdistricts (cum.) | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 |
| Villages (per year) | 4,000 | 5,000 | 5,000 | 5,000 | 5,000 | 24,000 |
| Cumulative Population Covered (includes 17.7 M 1981 coverage | 20.9 M | 24.9 M | 28.9 M | 32.9 M | 38.9 M | 38.9 M |
| Provincial and District Trainers (per year) | 355 | 355 | 355 | 355 | 355 | 1,775 |
| Subdistrict Trainers | 1,700 | 2,000 | 2,000 | 2,000 | 2,000 | 9,700 |
| Village Health Communicators | 40,000 | 50,000 | 50,000 | 50,000 | 50,000 | 240,000 |
| Village Health Volunteers | 4,000 | 5,000 | 5,000 | 5,000 | 5,000 | 24,000 |

Source: Office of the PHC Committee, Ministry of Public Health, Thailand, 1981

Table 11

Targets of the Ministry of Public Health for the Fifth 5-Year Development Plan (Plan for Poor Areas), 1982-1983

| | 1982 | 1983 | Total |
|---|---|---|---|
| PHC Programme Area Coverage: | | | |
| Provinces | 37 | same as 1982 | 37 |
| Districts | 246 | same as 1982 | 246 |
| Subdistricts | 737 | same as 1982 | 737 |
| Villages | 7,000 | 7,000 | 14,000 |
| Impoverished Population Covered | 5.6 M | 5.6 M | 11.2 M |
| Village Health Communicators | 70,000 | 70,000 | 140,000 |
| Village Health Volunteers | 7,000 | 7,000 | 14,000 |
| Total Budgets | ฿41,278,650 | ฿41,278,650 | ฿82,557,300 |
| (Rate: $1=฿23) | $1,794,724 | $1,794,724 | $3,589,448 |

Source: Office of the PHC Committee, Ministry of Public Health, Thailand, 1981.

## Costs and Financing of the National Primary Health Care Program (1977-1986)

During the Fourth Five-Year Economic and Social Development Plan period, 1977-1981, the National Primary Health Care Program of Thailand trained 21,509 village health volunteers and 213,600 village health communicators, a total of 235,115 village-level primary health workers to serve in 21,509 rural villages of Thailand. This was accomplished at a direct training cost of $2,126,955, or about $ 9.04 (฿208) per volunteer trained. But this was only 37.6% of the total cost of the National Primary Health Care Program which came to $ 5,646,642 for the five-year period. On average, $1,129,328 was spent per year in the first five years to launch and maintain the National PHC Program. These costs are summarized in Table 12.

Table 12

Costs of the National Primary Health Care Program in Thailand During the Fourth Five-Year Development Period, 1977-1981

| | 1977 | 1978 | 1979 | 1980 | 1981 | Total 1977-81 |
|---|---|---|---|---|---|---|
| Number VHV Trained | 1,912 | 4,958 | 4,865 | 4,674 | 5,100 | 21,509 |
| Number VHC Trained | 17,609 | 47,198 | 48,549 | 50,120 | 50,130 | 213,606 |
| Total Number Trained/Year | 19,521 | 52,156 | 53,414 | 54,794 | 55,230 | 235.115 |
| Total Number Trained | 19,521 | 71,677 | 125,091 | 179,885 | 235,115 | 235,115 |
| Direct Training Costs US$ | $214,695 | 524,95945 | 667,128.95 | 320,710 | 399,462 | $2,126,955 ($9.04/each) |
| Training Program Support Costs US$ | $ 50,000 | $244,150 | $273,850 | $276,500 | $269,000 | $1,113,500 |
| Total Training Program Costs US$ | $264,695 | $769,109 | $940,978 | $597,210 | $668,462 | $3,240,455 ($13.78/each) |
| Costs of Field Support and Supplies for PHC Activities US$ | $339,200 | $606,923 | $604,064 | $775,500 | $380,500 (6.90/each) | $2,406,187 ($10.23/each) |
| VHV/VHC Training and PHC Program Costs US$ Total for Year | $603,895 | 1,376,032 | 1,545,042 | 1,072,710 | 1,048,962 | $5,646,641 ($24.01/each) |
| Cumulative Total US$ | $603,895 | 1,979,927 | 3,524,969 | 4,597,679 | 5,646,641 | $5,646,641 ($24.01/each) |

The start-up costs in the first year of the program were predominantly direct training costs and training program support costs, but the high cost of supporting and maintaining the program quickly dominated. Beyond the costs of the training program itself, the PHC program provides a $25 first aid kit with household medicines, family planning materials (including condoms and oral contraceptives) and educational materials to each of the village health post volunteers. Health communicators receive educational materials, and traditional birth attendants receive a midwifery kit. The village health volunteer first aid kits are provided at the completion of training, and the cost is covered by the budget of the PHC Office. The costs of the VHV first aid kits during 1977-1978 are presented in Table 13.

Table 13

Number and Cost of Village Health Volunteers' First Aid Kits, 1977-1981

| Items | 1977 | 1978 | 1979 | 1980 | 1981 | Total |
|---|---|---|---|---|---|---|
| 1) Funds for VHVs' First Aid Kits at $25 (500 baht) each | $20,000 | 155,000 | 127,500 | 127,500 | 127,500 | $557,500 |
| 2) Number of First Aid Kits for VHVs | 2,000 | 5,100 | 5,100 | 5,100 | 5,100 | 22,400 |

Source: Office of the PHC Committee, Ministry of Public Health, Thailand, 1981.

Putting the National Primary Health Care Program into operation required resource mobilization from a variety of other divisions or departments within and outside the Ministry of Public Health. For example, the Family Health Division provides oral contraceptives, condoms, and family planning educational materials. The Nutrition Division provides balance scales, nutritional food supplements and other nutrition materials. The Department of CDC provides antihelmenthics, oral rehydration salts, immunization materials and so on.

While the average direct cost of training a volunteer was only $9.04, the average total training cost per volunteer was $13.78 including training program support costs. Equally important for planners, however, was the average cost of supporting the primary health care activities of a volunteer at the village level, which added another $10.23 per volunteer for the period observed, or a total average cost per volunteer of $24.01 for the period observed.

Given the data presented, the annual per capita cost of the entire PHC Program in 1981, in terms of the population actually covered by the Program, is only $0.05, or about ฿1.30 per capita per year.

In 1981, the estimated annual cost of supporting a volunteer primary health care worker's activity after training at the village level was about $6.90 per year (฿158/year). The cost of training and supporting the volunteers trained in the first five years of the MOPH's PHC Program was $5,646,641. By the end of 1986 when 499,115 village health volunteers and village health communicators will have been trained for over 45,000 villages, the cost to the RTG to support the primary health care program will be over $8,000,000 for the ten-year period, and will have cost over $1,620,000 annually.

The time is right to conduct some in-depth cost analyses of the National PHC Program to assess the cost implications of the program for the Fifth Five-Year Development Plan period, 1982-1986, when the total number of village health volunteers and village health communicators will more than double.

During the Fifth Five-Year Development Plan period, 1982-1986, the National PHC Program of the MOPH will train another 24,000 village health volunteers and 240,000 village health communicators to serve in 24,000 more villages. This will be accomplished under the MOPH's "Regular Plan". The budget for this plan is summarized in Table 14. It is observed that the amount budgeted per trainee for training is $15.42 during 1982-1986, compared with $9.04 during the last five-year development period (1977-1981). Similarly, the additional cost of supporting the training program under the new plan is $17.11 per volunteer compared to the earlier cost of $13.78 per volunteer. While the average five-year cost of supporting one volunteer was $10.23 (or an estimated $6.90 per year per volunteer) during the 1977-1981 period, the amount budgeted for the 1982-1986 period is $13.51 per volunteer.

The total cost of the ten-year (1977-1986) National Primary Health Care Program in Thailand is $13,732,773 ($5,646,642 for FY77-81 + $8,086,131 for FY82-86). Of this amount, only 45.14% ($6,199,935) will be spent on the direct costs of training village health volunteers and village health communicators, and only 11.35% ($1,559,000) will be spent on support costs of the training program, for a total cost of training of some 56% ($7,758,911) of the total cost. The overall ten-

Table 14

Projected Costs of the National Primary Health Care Program in Thailand During the Fifth Five-Year Development Period 1982-1986

| | 1982 | 1983 | 1984 | 1985 | 1986 | Total 1982-86 |
|---|---|---|---|---|---|---|
| Number VHV Trained | 4,000 | 5,000 | 5,000 | 5,000 | 5,000 | 24,000 |
| Number VHC Trained | 40,000 | 50,000 | 50,000 | 50,000 | 50,000 | 240,000 |
| Number Trained/Year | 44,000 | 55,000 | 55,000 | 55,000 | 55,000 | 264,000 |
| Number Trained/ Cumulative | 279,115 | 334,115 | 389,115 | 444,115 | 499,115 | 499,115 |
| Direct Training Costs | $734,596 | $834,596 | $534,596 | $834,596 | $834,596 | $4,072,980 ($15.42/each) |
| Training Program Support Costs | $ 74,250 | $ 92,813 | $ 92,813 | $ 92,813 | 92,813 | $445,500 |
| Total Training Program Costs | $808,846 | $927,403 | $927,403 | $927,403 | $927,403 ($16.86/each) | $4,518,456 ($17.11/each) |
| Costs of Field Support and Supplies for PHC Activities | $793,535 | 693,535 | 693,535 | 693,535 | 693,535 ($13.51/each) | 3,567,675 |
| VHV/VHC Training and PHC Program Costs -Total for Year | 1,602,381 | 1,620,938 | 1,620,938 | 1,620,938 | 1,620,938 | $8,086,133 ($27.51/each) |
| -Cumulative Total | 1,602,381 | 3,223,319 | 4,844,257 | 6,465,195 | 8,086,133 | 8,086,133 |

year cost of supporting PHC field activities is $5,973,802, or 43% of the total cost of the ten-year program. The annual cost of support for the PHC Program in 1986 will run $693,535, or about $12.60(฿290) per volunteer per year, representing 42.78% of the total budget for the PHC Program. Maintenance of the overall PHC Program is expected to run between $1,600,000 to $2,000,000 per year or more, depending on the level of activity generated and supported by the program.

When the ten-year PHC program costs and projected costs given above are combined, the average cost per volunteer trained and supported comes to $27.51. This is a very low cost <u>if</u> the volunteer <u>is</u> indeed adequately supported so that he/she can effectively serve his/her village neighbors. Adequate levels of support and technical guidance need to be continuously monitored for the National Primary Health Care Program to achieve its aims and to have impact on the health of the population it aims to serve.

Table 15 provides an overview of the sources of funding by which the Royal Thai Government financed the implementation of the National Primary Health Care Project during the years 1977-1981. The Royal Thai Government allocated $1,255,522 from the Thai National Budget during this period, and negotiated a development loan which provided another $1,000,000 from the U.S. Agency for International Development to cover some program costs for the training of village health communicators and village health volunteers. Therefore, the Royal Thai Government assumed financial responsibility for $2,255,522 of the total $5,646,642, or 39.94% of the total cost. $3,391,120, or 60.06%, was provided as grants to the RTG, $2,659,580 from U.N.I.C.E.F. and $731,540 from the World Health Organization. In the Fifth Five-Year Development Plan period, 1982-1986, the Royal Thai Government will accelerate implementation of the village health volunteer scheme to cover impoverished areas on a priority basis, and most likely will not require external funding for the program.

Table 15

Source of Funding for Implementation of Thailand's National Primary Health Care Program, 1977-1981

| Source | Contribution During 1977-81 | % of Total Cost |
|---|---|---|
| RTG Financed: | | |
| Royal Thai Government (MOPH Budget for PHC) | $ 1,255,522 | 22.22% |
| USAID Loan | $ 1,000,000 | 17.70% |
| Subtotal | $ 2,255,522 | 39.94% |
| Grants: | | |
| UNICEF Grants | $ 2,659,580 | 47.10% |
| World Health Organization | $ 731,540 | 12.96% |
| Subtotal | $ 3,391,120 | 60.06% |
| Total Costs | $ 5,646,642 | 100.00% |

## TRAINING MIDWIVES, SANITARIANS, AND NURSE PRACTITIONERS

The wechakorn paraphysician training program of the Lampang Health Development Project is the key feature that underwent the greatest adaptation in the replication process. Wechakorn in Lampang were developed from existing health manpower of the Lampang Provincial Hospital and rural health facilities -- predominantly midwives, sanitarian health workers, nurse aides and nurses. The competency-based training approach proved to be effective in developing paraphysician skills among these types of health workers, and the training materials and methods developed in Lampang were used by the MOPH in planning and implementing two different paraphysician training programs: (1) Nurse Practitioners (6 months to 12 months) and (2) Basic Medical Care Training for Midwives and Sanitarians (4 months to 6 months).

### Nurse Practitioner Training Program

The first nurse practitioners to be trained in Thailand were trained by Mahidol University as early as 1973 on a pilot study basis. They were trained by the Faculty of Medicine at Ramathibodi Hospital and, later, part of their training was conducted by the Faculty of Public Health, Mahidol University. The successful training and deployment of wechakorn paraphysicians in Lampang added impetus to the increasing acceptance by the medical and nursing communities of the paraphysician or physician extender concept. By 1977, MOPH leaders were promoting the planning of new training programs to produce paraphysicians to help fill the gap in the delivery of medical care services in rural areas. While the medical community (represented officially by the Medical Society) was not strongly in favor of medical care training for midwives and other auxiliary health workers, there was a ready willingness to support the concept and training of nurse practitioners, primarily for assignment to district hospitals and to provincial hospitals.

With a low-interest development loan made available by the United States Agency for International Development (Primary Health Care Expansion Project, 1977-1981),the MOPH set out to train 900 nurse practitioners for deployment to district hospitals and provincial hospitals. The long-term goal of the MOPH is to assign at least one nurse practitioner to every district-level health facility in the country, giving first priority to district-level facilities without physicians.

Nurse practitioners at district hospitals and district medical and health centers are responsible for providing direct medical care and for supervising the provision of medical and health services from district-level health facilities. When a doctor is present at the facility, the nurse practitioner works under his/her supervision, assuming his/her responsibilities when he/she is absent. The nurse

practitioner generally acts as head of nurses for the district hospital and supervises the medical care, health promotion, and disease prevention work of health workers at the subdistrict-level health centers and the midwifery centers at both subdistrict and village levels. Whenever a physician is not present at the district hospital, the nurse practitioner generally functions as the supervisor of the facility and coordinates its overall activity. Nurse practitioners in the national program, therefore, are basically providing the same range of services and are assigned the same functions as wechakorn paraphysicians at district hospitals in Lampang.

The nurse practitioner training program that was developed at Mahidol University was originally directed to service in a large hospital, like Ramathibodhi Hospital in Bangkok. Therefore, the course was strong in clinical care training and emphasized early detection and screening of medical care patients, but did not emphasize health promotion or disease prevention.

When the training program was revised by Mahidol University and the MOPH for training nurse practitioners to serve in district hospitals, the training materials used in the Mahidol program and those used in the Lampang wechakorn training program were reviewed and revised to develop a new curriculum for the training of nurse practitioners for district hospitals.

Nurses already trained in public health are given a 6-month training course which emphasizes medical care and administration. Nurses without previous training in public health are given a 12-month course which includes clinical care, administration, and public health.

Like the wechakorn training program, the nurse practitioner training program equips nurse practitioners to delineate medical problems (differential "diagnosis"), treat most medical problems, perform minor surgery, handle most emergencies, manage some types of abnormal deliveries, perform episiotomies, insert IUDs, carry out MCH/FP activities, supervise other personnel in medical and health work, and administer a rural health facility such as the district hospital or medical and health center.

While the MOPH made a strong commitment and secured funding to train some 900 nurse practitioners during the period 1978 to 1981, difficulty was encountered in having nurses released for the 6 to 12 month training program and the MOPH training targets were not achieved, as can been seen in Table 16.

Table 16

Training Targets and Achievements of MOPH

| Training Program | FY-78 | | FY-79 | | FY-80 | | FY-81 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Target | Actual | Target | Actual | Target[a] | Actual | Target | Actual | Target | Achievement as of Sept. 1981 |
| Nurse Practitioners: (6-12 months) | 150 | 129 | 300 | 166 | 300 | 120 | 150 | 80 | 900 | 495 |
| Midwife and Sanitarian Training in Basic Medical Care (4 months) | 350 | 345 | 730 | 710 | 820 | 805 | 350 | 342 | 2,250 | 2,202 |
| Health Assistants: | | | | | | | | | | |
| (4 weeks) | 41 | 36 | 270 | 272 | 192 | 193 | - | - | 503 | 501 |
| (6 weeks) | 50 | 47 | 423 | 517 | 194 | 196 | - | - | 667 | 760 |
| DDHO/Supervisors | 110 | 193 | 110 | 49 | - | - | - | - | 220 | 242 |

The MOPH training target for nurse practitioners trained under the USAID-financed Primary Health Care Expansion Project was originally set at 540 for the twenty provinces included in this development program. This target was later revised to 495, including 280 nurse practitioners trained in the one-year course for those who had no previous public health training and another 215 in the six-month course (for those who were already public health nurses).

## Basic Medical Care Training for Midwives and Sanitarian Health Workers

The second "wechakorn-like" training course established by the MOPH was for training auxiliary midwives and sanitarians (mostly midwives) in basic medical care. For the twenty-province Population Project, a training target of 2,250 trainees was set. By 1981, 2,202 had been trained. The estimated cost of training midwives (or sanitarians) in the short 4-month course in basic medical care is $685 per trainee.

The four-month basic medical care course for auxiliary midwives and sanitarian health workers provides trainees with the knowledge and skills to provide curative services for common diseases, such as respiratory infections and diarrhea; to identify more serious conditions requiring referral; to perform some emergency care, minor surgery, treatment of injuries and accidents, as well as clinical record keeping and the training and supervision of village health volunteers and health communicators. The auxiliary midwives and sanitarian health workers at all rural health centers will be trained to provide better curative care services and to work more intensively in support of village-level health activities of the village health volunteers and health communicators. However, the increased demand for curative care sometimes limits the time they have available for village activities. Technical supervision for the medical care activities of auxiliary midwives and sanitarians is provided by the physician at the district hospital; however, physicians at district hospitals frequently find themselves too busy to provide the level and frequency of supervision needed by midwives and sanitarians.

To help alleviate the increased work burden of health center midwives and sanitarian health workers, health assistants are also trained in a basic training course for service at health centers. The health assistant trainees are generally young women aged 18 to 20 years with a grade 10 education. Their training lasts only six weeks and they function at health centers or midwifery centers as junior paramedicals, assisting the midwives and sanitarian health workers at the health center. A shorter four-week course is provided for MCH/FP health assistants, generally recruited from 18 to 25 year-old women with a grade 10 education or higher who are interested in MCH/FP. Once trained, they provide valuable assistance at health centers to operate family planning clinics, provide oral contraceptives and condoms, maintain family planning records, monitor drop-outs, and provide FP information, education and communications for the health center MCH/FP program.

The cost of replicating the manpower development features of the Lampang Project have been reduced under the MOPH policy and plan during the development periods of both 1977-1981 and 1982-1986. The average cost of training village health volunteers and communicators under the nationwide primary health care program is only $13.78 for the period 1977-1981 and only $17.11 for the period 1982-1986. The costs of training wechakorn in Lampang stabilized at about $2,000 per trainee, but in the national program for training midwives and sanitarians in the short 4-month basic medical care training course, the cost of training is estimated at $685 per trainee.

Table 17

Comparative Unit Training Costs of the Lampang Health Development Project and the MOPH National Programs for Training Primary Health Workers, Nurse Practitioners, Midwives and Sanitarians in Basic Medical and Health Care

| | Lampang Project | MOPH National Program |
|---|---|---|
| Health Post Volunteers or Village Health Volunteers | $124 | $16-18 |
| Health Communicators | $ 17 | $16-18 |
| Traditional Birth Attendants | $112 | $16-18 |
| Nurse Wechakorn (12 months), and Nurse Practitioners (6-12 months) | $2,000 | $ 301 |
| Midwife and Sanitarian Wechakorn (12 months), and Midwife and Sanitarian Basic Medical Care Training (4 months) | $2,000 | $ 685 |

The training costs of a demonstration project which aims to introduce new types of personnel or to expand the functions of existing categories of personnel may run substantially higher during the early "development" years than would be required in nationwide replication. The Thai Ministry of Public Health has contained costs for replication of these features in a number of ways, such as (1) shortening the period of training, (2) paying lower levels of stipends to trainees, or paying no stipend or perdiem as in the nurse practitioner training program, (3) using existing government personnel to conduct training courses, and (4) developing the curricula and training materials for the nationwide program from basic curricula and training materials developed in pilot or demonstration projects like the Lampang Health Development Project which had already developed and tested materials for training and which were easily adapted for the national program.

## COMMUNITY AND PRIVATE SECTOR PARTICIPATION IN HEALTH

"The concept of PHC in Thailand was developed from our experience gained in attempting to solve the health problems of the people in the rural areas who have been underserved by the government health services delivery system. A basic concept is that community participation is the key to the success of the PHC program. Community participation comprises the contribution of ideas, manpower, money and materials, to the extent that these are available within the community. Helping to develop the people of the community to be self-reliant and self-supporting, to the extent possible, is a basic concept for strengthening the overall program" (Desawasdi, P., 1981)

## Community Participation

The national health policy for the Fourth Development Period specified five guidelines for implementation of the policy, and one of these guidelines states clearly: "Encourage public participation or self-help community services through the development of village health volunteers, village health communicators, and village community organizations." This is a central strategy of the Primary Health Care Program. The policy and plan concerning village health volunteers, communicators, and committees has been carried forth to the Fifth Five-Year Development Plan where it is given an even higher priority, now strongly endorsed and promoted by the national Cabinet and the NESDB, in addition to the MOPH.

Beyond the extensive levels of community participation in health that will result from the training of nearly 500,000 village health communicators and village health volunteers, including the establishment of a village health committee in every village, the MOPH policy and plan continues to promote the training of traditional birth attendants and other indigenous healers, including herbalists and druggists. Pilot projects are already underway to study various herbal medicines and to enlist the cooperation of herbalists and other indigenous practitioners to receive training and to participate in primary health care activities. Monks have made a formal request for training in medical care, and the Faculty of Public Health of Mahidol University has embraced an opportunity to train monks in medical care under a new pilot program.

## Private Sector

The national health policy and plan promotes the involvement of private health care providers in the Primary Health Care Program. Traditional birth attendants, traditional practitioners, herbalists, and other indigenous health care providers are encouraged to participate, as mentioned earlier. Additionally, the MOPH has encouraged the cooperation of druggists, applying one of the approaches developed in Lampang. Depending on local conditions and health leadership, the private sector has played varying roles in the provision of funds, manpower, supplies and/or equipment for water and sanitation programs, village health volunteer support programs, and nutrition improvement programs.

One of the most notable contributions made by a private organization to the MOPH policy and plan has been the notable family planning services provided in both rural and urban areas by the Community-Based Family Planning Services (CBFPS) organization. In some provinces, the CBFPS organization trains village health volunteers, and monitors and coordinates their activities. CBFPS has innovatively

expanded these programs beyond the initial family planning activities, and is now applying appropriate technology for community development programs and family income development programs aimed at making improvements on the basic problems of raising family income to help break the vicious cycle of poverty-malnutrition-illness.

Free Medical Care Policy and Local Financing of Health Care

The MOPH policy and plan for the Fourth and Fifth Development periods has aimed at the provision of free medical care services for impoverished families in both rural and urban areas. Planning for implementation occurred during most of the Fourth Development Plan period and the program has recently been announced and is now being implemented, albeit with some difficulty. The program aims to provide free medical care services for impoverished families to help break the poverty-illness-malnutrition cycle for those most affected. Although the program is being implemented with some difficulty, one cannot argue with its aims.

The MOPH has also fostered a number of schemes for the local financing of health care. A number of different schemes are being implemented on a pilot basis in an effort to find those that are most practical. Village revolving funds have been established in some villages for programs of environmental improvement, such as construction of water-seal privies, construction and maintenance of water pumps and well covers, construction and maintenance of rainwater storage tanks, and so on. Village medical cooperatives have also been developed to locally finance the costs of medicines, medical supplies, and medical care services. And village nutrition cooperatives are being implemented on a pilot basis to promote improved production of agricultural products needed in nutrition improvement programs, such as soybean, green beans, peanuts, and so on. A flexible approach is important to the development of local health financing schemes. The particular type of financing mechanism to be considered in a particular area should be determined locally, taking into account the relative levels of development and resources available in the area, and the degree of community organization that exists. Very poor areas may not have adequate resources for local financing schemes, in which case the "free medical care program" will provide needed services. More developed areas with better community organization are more appropriate for launching health and medical cooperative schemes. Transitional areas (not so poor but not so well off) may find revolving fund schemes and other variations of local financing more appropriate. These decisions are best made by local residents who should accept responsibility for promoting and implementing their respective programs. Given the heavy financial burden on the MOPH to cover all villages in Thailand with the Primary Health

Care Program, continued efforts are certain to be made during the Fifth Development Plan period to encourage local financing of primary health care services. The network of village volunteers and health committees provides an invaluable structure and organization for fostering local financing of health care.

## THE NATIONAL HEALTH DEVELOPMENT NETWORK

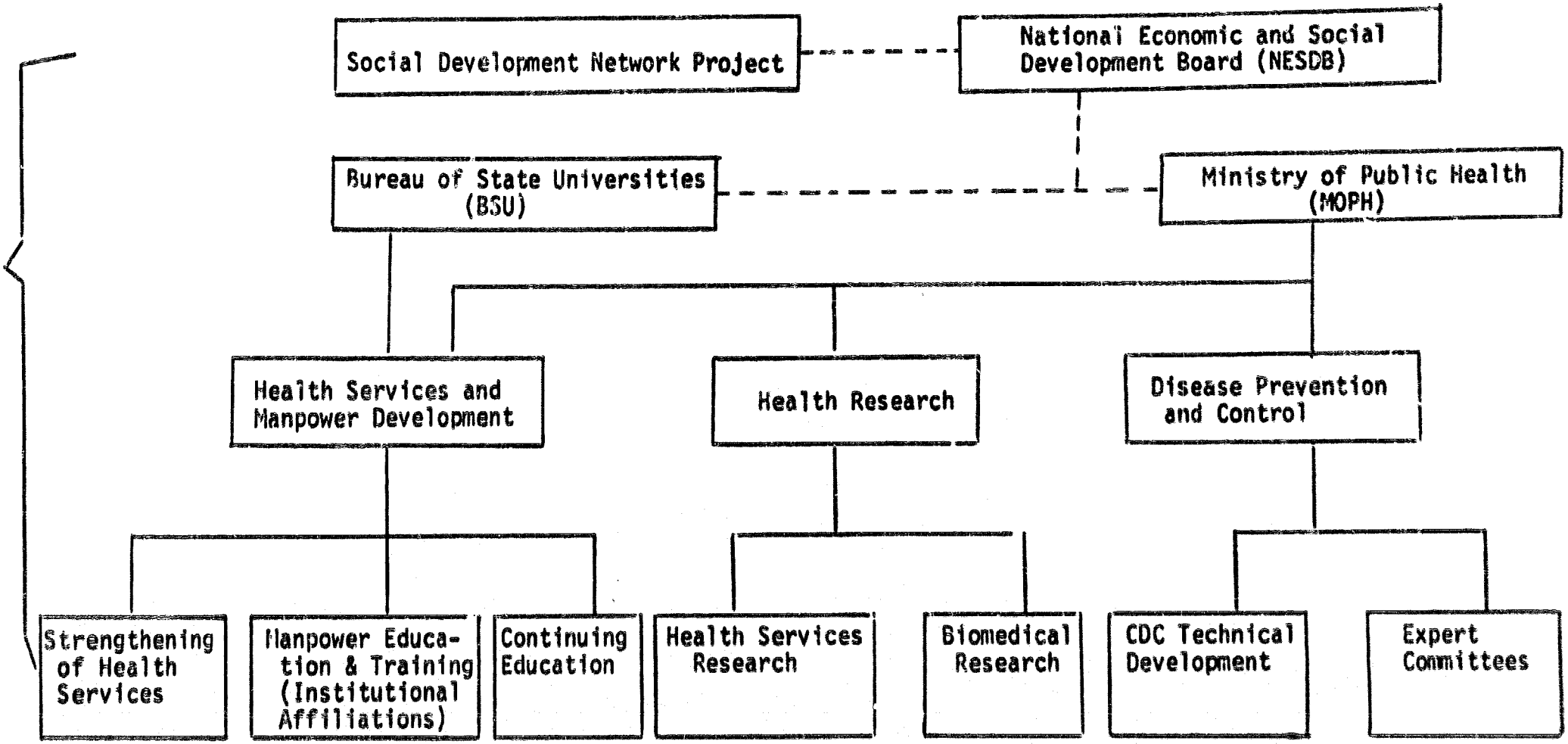
Beyond the specified key features of the Lampang Health Development Project, there were a number of notable approaches implemented by the Project in its rural health development effort. One of these approaches was based on the concept that more could be achieved by collaboration between universities and the MOPH than could be achieved by working independently, even if towards the same goal. The Lampang Project established a close collaborative framework between the MOPH and Chiang Mai University, between the MOPH and the NIDA, and between the MOPH and a number of other universities within and outside of Thailand. Medical educators from universities participated in the training program for wechakorn, along with MOPH personnel, and evaluation specialists from both Chiang Mai University and NIDA participated together in the evaluation and monitoring activity of the Project. The technical expertise of university personnel enhanced the MOPH activities undertaken, and the field experience gained in this collaborative effort enriched the education and training programs of the universities. Beyond this, the historical duplication of effort and inappropriate use of limited resources available that resulted from the MOPH and universities operating independently could be overcome by collaborative efforts to work towards common goals while benefiting the special interests of each.

During the Fifth Five-Year Economic and Social Development Plan period, 1982-1986, the National Economic and Social Development Board will implement the Social Development Network Project at NESDB for the purpose of developing closer multi-sectoral, multi-agency collaboration and, within this framework, developing closer collaboration between universities and agencies of the RTG. Under the Social Development Network Project, various ministries involved with social development will collaborate closely on common programs. The key ministries are the Ministry of Health, Ministry of Education, Ministry of Agriculture and Cooperatives, and the Ministry of Interior (Community Development and Local Administration). The NESDB, Bureau of the Budget, and Civil Service Commission will also participate in the work of the Social Development Network Center.

The Health Development Network being created under the NESDB Social Development Network Project will effect a close collaborative relationship between the Bureau of State Universities and the Ministry of Public Health, and will effectively coordinate collaborative efforts, such as the training of nurse practitioners. The major areas for collaboration between the MOPH and the Bureau of State Universities will be Health Services and Manpower Development, including the strengthening of health services, manpower education and training, continuing education, and health services research.

Figure 2

The Health Development Network of the Social Development Network Project of Thailand's National Economic and Social Development Board for the Fifth Five-Year Development Plan, 1982-1986



> "Health for all doesn't mean that in the year 2000 nobody will be sick or disabled, nor does it mean that in the year 2000 doctors and nurses will provide medical repairs for everybody in the world... It does mean that health begins at home, in schools, and in working places. It does mean that the people will use better approaches than they do now for preventing diseases and alleviating unavoidable illness and disability, and better ways of growing up, growing old, and dying gracefully." (Tuchinda, 1981/July)

## HEALTH SYSTEM IMPLICATIONS OF REPLICATION

The strategy and the key features of the Lampang Health Development Project were designed to meet the existing needs of the provincial health care delivery system in Lampang so that it would have the capacity to reach and serve a majority of the rural population. The key features of the Project and other components of the provincial health care system must be viewed as mutually supporting parts of the whole system, and not as separate parts which are independent of one another. Community health volunteers and health committees at the village level operate as a village-based network for primary health care services delivery which is an extension of the provincial health care delivery system and is functionally linked to the rest of the system by crucial, mutually supporting relationships between health post volunteers and wechakorn paraphysicians and other health workers at subdistrict health centers, and between traditional birth attendants and government midwives at the nearby midwifery centers. Village health post volunteers and rural health personnel are functionally and integrally linked to the rest of the system by operating mechanisms for patient referral, supervision and technical guidance, information and reporting, procurement of materials and supplies, and other logistics of the system which provide the means to hold the system together, to keep components of the system "on course" in terms of health programs, and to foster program effectiveness and efficiency. Functionally they are linked and integrated under a single health care administration which comes under a single authority, the Office of the Under-Secretary of the Ministry of Public Health.

These points have a bearing on both the interpretation of evaluation results and on planning for possible "replication" of project key features elsewhere. The evaluation results that are reported in this monograph and in the previous three monographs represent in general terms the composite effects of the Lampang Project's key features and all the components of the Lampang provincial health care system. The improvements observed in the capacity of the system to reach and serve the majority of the population, the changing patterns in the selection, provision, and utilization of health services, the impact on the environmental conditions and on the population's health, and the changes observed in the overall costs of the health system in many cases cannot be attributed to any single key feature or component of the provincial health care system. The changes observed frequently represent the composite effects of the entire system.

It is important to consider the inter-relationships that are immediately apparent: structural inter-relationships, with particular reference to the infrastructure of the health system, and functional inter-relationships, with particular reference to the interactions and functional links between the various components or key features of the system. To the extent that these are mutually supporting and interdependent components, one component or key feature could not be expected to perform as effectively in another system if the receiving system did not also provide for the same level of interdependent and mutually supporting relationships with other components of the system. For example, the primary health care network at the village level operates most effectively when there is a strong relationship between the village health volunteers and the wechakorn paraphysician and between other health workers at the subdistrict health center or midwifery center. Would the primary health care network at the village level function as effectively, or function at all, without the supporting role of wechakorn paraphysicians and other health workers at the health center or midwifery center? Similarly, the health center staff could not have the same effectiveness in operating community-based health services without the supporting role of community health volunteers.

When replication occurs, both structural and functional inter-relationships must be taken into consideration. Too often, processes of replication provide for structural inter-relationships without appropriately or adequately considering the functional inter-relationships. Both are important. But functional inter-relationships are particularly important in terms of effectiveness and efficiency of health

programs. For instance, what could be expected, given the above example, if the primary health care network were replicated intact but where there was no mutually supporting relationship with wechakorn paraphysicians (or their equivalent) at the local health center? The wechakorn paraphysicians trained by the Lampang Project in an intensive, 12-month, competency-based training program now provide an impressive new range of services at rural health centers and they can conduct a comprehensive approach to community health services through the network of village volunteers. Wechakorn training emphasized health promotion, disease prevention, clinical care, and community health services. Will midwives and sanitarian health workers in other areas be provided training opportunities to develop the same range of capabilities as wechakorn paraphysicians in terms of their clinical and health skills, judgement, understanding, and approach to community health?

## COST IMPLICATIONS OF REPLICATION

Chapter 4 documented MOPH policies and plans for the two Five-Year Development Periods of 1977-1981 and 1982-1986. Cost implications of implementing the National Primary Health Care Program nationwide were taken into consideration in preparing the plan and in winning support from the Cabinet, the National Economic and Social Development Board, the Bureau of the Budget, and the Civil Service Commission. Implementation of the plan in the past four years has been impressive from the standpoint of the numbers of village volunteers trained, the government's commitment to the program, and the government allocations to the program. But the costs of expanding the system in the next five years and sustaining it cannot be based only on the lower costs experienced in the first four years.

The overall ten-year plan for developing primary health care in Thailand will cost about $46 million dollars, with 81% of this amount allocated for support of field primary health care activities and 23% allocated for training of village health volunteers and village health communicators.

In the first five years of PHC program implementation the Royal Thai Government absorbed (financed) 72% of the costs; only 28% of the cost was provided in the form of grants, mostly from UNICEF and WHO. The RTG gives a high priority to the PHC program, as evidenced by the cabinet's recent allocation of a "special" budget of $3,589,448 for implementation of the PHC program in impoverished areas, over and above the costs of the "regular" PHC implementation plan.

But, what factors should be considered and what assumptions should be made in estimating future costs of the program, particularly when nearly a half-million village health volunteers and health communicators will have been trained to serve in nearly 50,000 villages? Will costs remain as low as they have been during the early years with relatively low levels of activity and rates of utilization of primary health care services? The costing exercise should take into account the general but consistent and clear trend of increasing utilization of PHC services over time.

In Lampang, the PHC activity at the village level was relatively low in the early years of implementation but there has been a clear and consistent trend towards greater and greater utilization of the primary health care component of the provincial health care system. As seen in Figure 3 of Monograph 2, the average number of medical care and family planning contacts per health post volunteer doubled in the first two years of service, and doubled again in the next two years of service! The slope of the increasing average number of these contacts per volunteer has not yet begun to level off, and the increase in volume of HPV-provided services continues. If the experience in Lampang is any indicator of what could be experienced in the National Primary Health Care Program, one should expect substantial increases in the average volume of services provided per volunteer, meaning that the average costs per volunteer in the first years of the Program should not be -- in absolute terms -- the basis for additional budgetary allocation in later years of the program. It is entirely conceivable, based on observations from Lampang, that the costs of supporting village volunteers will not follow a linear pattern as more and more volunteers are trained, but that the costs of supporting volunteers will follow a more exponential pattern as the demand for services increases and as each volunteer provides a greater and greater volume of services per year.

It is crucial to the success of the National Primary Health Care Program that the support needs of the village volunteers be carefully monitored, be regularly reviewed and assessed by senior MOPH leaders, and be responsively attended to as soon as possible when support needs become apparent.

## PROGRAM IMPLICATIONS OF REPLICATION

With the volume of services provided by health post volunteers expanding each year and with the average number of contacts per volunteer doubling every two years, some volunteers have shown signs of "overload". It must be remembered that they are, in fact, volunteers -- and most of them have other occupations that are essential to family survival. The voluntary system has worked reasonably well in Lampang, with attrition levels to date remaining below 20% even after five years of voluntary service. But as the demand on volunteers' time becomes greater for providing primary health services and as they are distracted more and more from their occupations,one might anticipate either (1) increased rates of attrition as volunteers face the difficult realities of survival, particularly in times of worldwide recession and double-digit inflation (inflation in Thailand over the past seven years has ranged from 9% to 20% per year); or, (2) the need to compensate "volunteers" for their services, so that they can indeed continue to provide primary health services. In many countries, primary health workers do receive some type of compensation for their services. Given the realities of our times and the experience gained in Lampang, there may be a need in Thailand to develop the means for sustaining village volunteer performance through compensation of some type.

It is highly advisable for MOPH planners and provincial health managers to launch more pilot or demonstration projects on the theme of local financing of primary health care programs, whereby not only the costs of community health programs and primary health services are financed locally, but where the support of the village "volunteers" can also be provided for maintaining their role and for sustaining their expanding volume of services.

Primary health care programs in each province should identify and develop <u>priority</u> village-level health programs such as local water supply programs and nutrition improvement programs. For health programs to be more effective in reaching those most in need of services and in providing the needed services more efficiently, a greater degree of technical guidance for health workers in the rural health centers and for village volunteers and village health committees is needed. In the case of Lampang, the types of programs for consideration on a priority basis could be: nutrition improvement programs; water supply programs; health education programs concerning treatment of drinking water, maternal and child nutrition, and food selection and preparation. For health programs with a broadly scattered or general target population, mass media should be used for education-information-communications activities, in addition to invoking the tremendous potential of village health communicators.

# CONCLUSION

## BEYOND REPLICATION: EXPANDING COLLABORATION FOR AND CONCEPTS OF HEALTH DEVELOPMENT

The strategy and approaches tested under the Lampang Health Development Project are already over ten years old and the basic assumption on which Project planning and implementation was based may, in fact, be far too narrow in scope and short-visioned in development perspectives.

Few Project observers were surprised that little effect was detected in terms of impact of Project interventions on the population's health status, although health interventions can make a difference, sometimes, given the "right" conditions. But the linkage between "health services" and "health" may not be very direct or close, as there are that other factors which have a much greater influence on health status. Health status is more closely keyed to levels of poverty and family income, to levels of education, and to environmental conditions (including the social and inter-personal environment, not only the physical environment) than it is to health services.

The point is that the scope of health development extends far beyond the capabilities of health professionals alone. Planning for health development should, of course, include health professionals because of the relationship between health and health services, and between health services and health development; but the process of health development <u>must</u> address the more basic factors influencing health -- particularly the factor of poverty or low family (or personal) income. To overcome the problem of poverty or low family income generally involves education or training, and other social and technical processes. Psychological factors and personal behavior have an important influence on health. Professionals from a variety of social, behavioral, political and other sectors can play an important role in conceptualizing and planning health development efforts that attack the roots of health problems. Those involved in the process of conceptualizing new approaches will need to discard the limiting elements of their respective professions, to apply a very broad perspective, to plan innovatively, and to implement comprehensively. Although "multi-focal" planning also may not be enough, these processes are clearly needed because they force one to think beyond traditional or conventional patterns.

The recent creation in Thailand of the National Health Development Network is progress in the "right" direction, and the National Health Development Network is headed by a far-thinking, perceptive, innovative and creative leader. This is a promising development on the long road to broad-based and long-lasting health development.

The authors do not purport to know the way, only that the way must be found if health development and "health for all" are to become anything but slogans. The way cannot be trodden alone,for broad-based collaboration is essential. The Lampang experience has exemplified to many the advances that can be made, even in a relatively short period, when broad-based collaboration is seriously undertaken in a spirit of sharing, innovation and learning together. Such collaboration should be continued between government agencies and universities, between the government and the private sectors, between countries and between regions. There is little to be lost, and there is very much, indeed, that can be gained. The Lampang Project has taken a small step, and the way has become clearer. Continued and expanded collaboration may spark the needed creativity to go beyond replication and to lead the way, realistically, to health for all.

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