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FAMILY PLANNING IN THE THIRD WORLD:
CONCEPTUAL CONSIDERATIONS AND AN APPLICATION TO RURAL THAILAND

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Frederick Albert Day, A.B., M.A.

* * * * *

The Ohio State University

1982

Reading Committee:
Lawrence A. Brown
George J. Demko
W. Randy Smith
Thomas N. Chirikos

Approved by

Adviser
Department of Geography
TO MY PARENTS,

BROTHERS, AND SISTER
ACKNOWLEDGMENTS

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VITA


1965. Graduated Granville High School
      Granville, Ohio

1969. A.B., Syracuse University
      Syracuse, New York

            Chunchon Middle School
            Chunchon, Korea

1974. M.A., The Ohio State University
      Columbus, Ohio

1975-1978. Research Associate and Frederiksen
            Fellow, Institute for Population
            and Social Research, Mahidol
            University, Bangkok, Thailand

1979-1981. Graduate Teaching Associate
            Department of Geography
            The Ohio State University

PUBLICATIONS


Patterns of Health Utilization in Upcountry Thailand: A Report of the
Research Project on "The Effect of Location on Family Planning/Health
Facility Use" (with Boonlert Leoprapai). 1977. Bangkok: Mahidol
University, Institute for Population and Social Research.

FIELDS OF STUDY

Major Field: Population Geography

Minor Field: Development

Specializations: Population Policy, Fertility, Family Planning,
               Urbanization, Migration

Regional Specialization: East and Southeast Asia
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CHAPTER I
INTRODUCTION AND RATIONALE

Introduction

Few issues have so quickly risen from virtual taboo to high national priority as has family planning. In the last two to three decades extensive national distribution systems in Third World countries have been developed to make birth control methods more readily accessible to the people in the hope of easing rapid population growth. Many governments perceive the problems accompanying rapid growth as the most serious of this century. Seen in this context government provision of family planning services is particularly important both because of its socio-political ramifications and because of the consequent large investments from national and international sources.

This dissertation looks at the differential use of family planning. In particular, it focuses on why people choose to use government or private outlets to obtain family planning services. The study involves comprehensive individual-level surveys and analyses for a province in rural Thailand, yet the observations may be relevant to similar programs
throughout the Third World. Understanding the complex interrelations between personal decisions and government initiatives at a grassroots level is vital to interpreting the successes and failures of government programs dealing with social welfare.

The Problem

This research evolved out of the specific problem of underutilization of the public health/family planning facilities in Thailand. It soon, however, broadened to encompass two related problems. The second problem was that, despite a large literature in family planning and fertility, researchers and policy-makers are still unclear on how to approach the problem of why people do or do not use family planning. Third, there is not much known (at least in a comprehensive manner) about why people choose a particular provider, nor understood about the relationship between the public and private family planning sector in general. Related to investigating all these problems, there is the difficulty of gleaning relevant insights from past research which is highly fragmented, approached from different perspectives and with many different purposes. Each of these problems can be discussed in turn.

The troubling evidence of underutilization in the Thai government public health/family planning delivery system was noted in early 1975 by the Thai-American Evaluation Team (1975). The concern of the team's leaders, Dr. Boonlert Leoprapai and Scott Edmonds, particularly over the possibility that problems of distance and poor locations of certain
facilities were at least partly at fault, led to an earlier study on which this dissertation is based. The underutilization of the facilities, it turned out, was more severe in connection with curative and health services, rather than family planning services, though several individual service units had poor family planning service records as well. The final report of the ensuing study (Day and Leoprapai, 1977) concentrated on aspects of both the health care and family planning functions of the public health system; this dissertation focuses only on the latter.

Although inherently geographic concerns of location and distance sparked the initial thoughts on the problems of public health system use, it soon became evident that this was too narrow a focus. Closer examination of the problem revealed many complex and interrelated factors, and it appeared necessary to find an approach to problems of the utilization of family planning with a wider perspective. However, relevant work in the field of geography was virtually non-existent, and the existing literature on family planning use behavior, both in Thailand and the Third World in general, gave few cues on how to comprehensively analyze the problem. It appears that answers to why people use family planning or a certain provider were known, but they were usually considered in isolation or small groups, and the overall relationship or the relative importance of these factors was not understood.

Related to this was the further problem that little was known about what motivated people to use private family planning facilities instead
of those of the government. The lack of understanding of the extent and potential of the private sector has only recently begun to be pieced together by a few studies of the informal (mostly rural) sector. Moreover, the Thai Ministry of Public Health has considered its program in isolation, and although it is now becoming more embracing of family planning providers outside its direct control, little is known about the relative advantages of the private sector and in what ways it might better supplement the national program.

A last and related condition, the fragmentation of literature on family planning, greatly exacerbates the previously mentioned problems. The field of family planning is diverse, and despite a few attempts to summarize parts of it, (e.g., Cuca and Pierce, 1977a; Ross, et al., 1972; United Nations, 1978, 1979a, 1979b), the programmatic research by and large remains unsummarized and unintegrated. This lack of a systematic integration of research findings has slowed down the accumulation of knowledge in the field.

Aims of the Study

Some of the problems above are conceptual in nature, some are empirical. To approach these problems, this study first draws up a conceptual model to comprehensively knit the general research and writings of family planning together. A portion of this model, the General Model of Diffusion of Family Planning, is elaborated into a second conceptual model which highlights the major components of the process underlying the use of family planning and a specific type of
provider. This second model, the Family Planning Transaction Model, provides the analytical framework for the case study in Thailand.

Specifically, this study examines the interrelationships between a geographically distributed set of public family planning facilities and a geographically distributed population of potential users. Within this context the Family Planning Transaction Model is tested to empirically determine which particular variables, as well as which more general components (the potential user, provider, gap and setting), are relatively more important in distinguishing between users and non-users of family planning and between users of the government and private delivery systems. Using individual-level data from Thailand, the technique of discriminant analysis tests how well we can group the users and non-users of different providers of family planning on the basis of their most important distinguishing characteristics. Based on the results, general policy recommendations are offered and certain conclusions, such as the importance of location and other inherently geographic variables, are mentioned as a possible starting point for future geographic work in family planning.

This dissertation, in short, encompassed two overall goals: first, to conceptually integrate and organize the literature of the field and second, to build and test a model to explain peoples' use of certain family planning facilities. To briefly illustrate the need for this kind of study, it seems appropriate to focus attention specifically on some of the deficiencies of past research and approaches in the study of family planning.
Past Research in Family Planning: An Overview

Research and writings on family planning are found in both the applied and academic literature. Research reports by the practitioners tend to be mainly descriptive, often recounting projects and their goals, and seldom justifying the research in a larger context or searching for the cause of events. The academic world has made an important contribution, it appears, by tempering the claims of overzealous family planning program managers that their programs have been responsible for the substantial fertility declines that have occurred in the Third World. In general, however, the academic mainstream has promoted little general study of family planning even though it is a topic closely tied to the growth of population, one of the most pressing problems of the twentieth century.

The larger portion of research is done by practitioners and medical researchers, and primarily consists of national program descriptions, biomedical clinical experiments, national acceptor statistical reports, and especially, experimental project results. A segment of these, special project reports for different experimental strategies to deliver family planning, is reviewed in Appendix B.1 of this study. Other examples of large bodies of writings within family planning include the subtopics of Information, Education, and Communication (IEC) and population education. Two other segments of this research, studies of the determinants of family planning acceptors and work on the knowledge,
attitudes and practice (KAP) of family planning also describe aspects of family planning service utilization, and thereby are relevant to the research reported in this dissertation.

The typical study of family planning service utilization in the Third World specifically describes the characteristics of program acceptors. Acceptance is cross-tabulated by age, parity, education, income and other variables, or it is placed in a regression equation as a dependent variable to be "explained" by such independent variables. This paints a general description of characteristics associated with acceptance and also helps in singling out target populations of non-users on which programmatic efforts might focus. However, such studies, many of them in-house evaluations of family planning programs, have emphasized the "demand" of family planning (the adopters or potential population), rather than looking for possible problems on the "supply" side, the delivery system with all the attendant organization/administration problems and choices of strategies. In addition, little has been noted about the effects of different social settings, or the interaction between the potential users (demanders) and suppliers of family planning. On the other hand, studies of the supply side, when done, usually have failed to relate supply conditions to either the setting or characteristics of the potential population (for example, see the studies reviewed in Appendix B.1).

Related to this concern with utilization is the attempt to determine fertility knowledge, attitudes and behavior and their relation to family planning. By 1972 approximately 133 major KAP studies had
been completed in 46 different societies. Literally hundreds of these studies were used as baseline surveys in the late 1960s and early 1970s for special family planning projects, as well as assessing a population's readiness for a family planning program. Although they have provoked some interesting controversy, for example, over the worth of variables on desired family size (e.g., Knodel and Prachuabmoh, 1973), they have proved to be of limited use. This is especially true with regard to their emphasis on attitudinal variables which revealed few policy-relevant conclusions. The studies have been criticized (e.g., Petersen, 1975) as to their general validity and more specifically for their failure to design surveys which took variations in local areas and cultures into account. One basis of this is that the survey design tended to resemble the questions and wording of the now classic Indianapolis study (Kiser and Whelpton, 1958) done in the United States in the 1940s.

More recent research, to be fair, improved on the KAP surveys and other problems. More carefully planned and thought out comparative national surveys sampled contraceptive prevalence and fertility behavior in several countries around the world. The best known of these studies are the World Fertility Surveys in the mid-1970s and the more recently conducted Contraceptive Prevalence Surveys (Morris, et al., 1981). These studies have been instrumental in documenting the major incipient declines in fertility in several Third World countries.

Despite these recent advances, other gaps in the present understanding of family planning service utilization exist. For
example, greatly overlooked is the private family planning delivery system, be it drugstores, private physicians or other providers. Although the private sector has supplied the vast majority of contraceptives in the West and a significant part of those in the Third World as well, it is seldom viewed as a viable alternative to public delivery systems in the Third World. Only recently has a small group of researchers called for "innovative" experiments with "commercially-based family planning" (in essence, private distribution) and social marketing (public and private cooperative schemes). It appears that public health ministries have little interest in the private sector, possibly because of the power and funding connected with their large public family planning programs. In fact, public health policy not only shies away from the private sector, but also overlooks family planning activities of government bureaus not under the ministry of public health. As a result, there has often been little comprehensive investigation of all government family planning activities or comparison of the differences between the private sector and the public sector. National family planning programs would benefit from such comparison to alternative delivery systems.

In summary, research and programmatic work in family planning has a large literature covering several major subtopics. However, the lack of integration of much of this work and summarization of findings has hindered an accumulation of generalizations and useful knowledge. Moreover, research designs have taken on a limited scope when analyzing family planning use. To provide a more encompassing perspective, two conceptual models were drawn up for this study.
Towards a Solution: Models of Family Planning

in a Process Framework

The two conceptual models of this dissertation attempt to overcome some of the fragmentation within the field of family planning by interpreting it through a more comprehensive process-oriented perspective. These models are briefly presented here and then discussed in detail in Chapter III.

The General Model of Diffusion of Family Planning is macro-scale oriented. It interprets family planning in a broad societal context, placing the literature in a framework that reflects the most recent perspective on innovation diffusion. Specifically, this model encompasses six aspects: 1) the technological development of birth control methods (the innovation), 2) the social setting in which change in family planning behavior occurs, 3) the entity providing the ideas and methods of family planning (a government or private propagator), 4) the delivery strategies of the propagator's agencies, 5) the acceptance or non-acceptance of family planning by the potential user (the adoption process) and 6) changes in each of the above as a result of the adoption of family planning. The model allows a fairly clear delineation of the various sub-fields in the literature and therefore permits a meaningful organization around which to view this study.

The second conceptual model elaborates a portion of the first, looking more closely at the transaction between the family planning
propagator and the acceptor (items 3, 4, and 5 in the macro-model above). This, the Family Planning Transaction Model, the basis for the major analysis of this study, accounts for usage patterns on a micro-level emphasizing the role of four major components in the family planning transaction: 1) characteristics of the potential user (the demand side), 2) characteristics of the provider (the supply side), 3) the "gap" between the potential user and provider, for example, social and physical distance, and 4) the socioeconomic setting in which the family planning transaction takes place.

A single behavioral model, thus, allows us to evaluate the relative significance of each component of the family planning utilization process. We can test the relative importance of both supply and demand factors (the potential user and provider characteristics), as well as whether development (the setting characteristics) or family planning accessibility (the provider and "gap" characteristics) is more important in an individual's decision to use family planning. All the factors which lead to a family planning transaction are important: we cannot simply describe people who accept or who do not accept. For example, it is quite possible that social distance or unfamiliarity between villagers and government health workers prevents women from accepting family planning in some situations. Alternatively, the location of a family planning service center and the strategies used to attract acceptors may be major obstacles to increasing acceptance. Past studies of family planning acceptance, as a result of their limited design, tend to overlook these factors of supply strategies and interaction.
Precisely because of this, much of the previous research has been of limited use to the policymaker. This our present model attempts to overcome.

In a general policy context, the Family Planning Transaction Model can point out what factors are most important in the acceptance of family planning or, stated from a different perspective, the use of a certain provider. In a specific context, the model can suggest the relative importance of each aspect for individual family planning facilities, acting in this way as a local-level evaluation tool. As a further aid in policy evaluation, the breadth and perspective of the model can extend beyond family planning itself and offer relevant insights by analogy for government ventures in other social service provision as well.

Thailand: An Important Case Study

Both of the aforementioned models will be used to organize studies of family planning in the Third World. The Family Planning Transaction Model will further provide the conceptual basis for the major analysis of the dissertation, the search for a better understanding of family planning usage patterns in Thailand. Family planning activities in Thailand provide an important and interesting case study for the Third World for several reasons.

First, Thailand, with 47 million people (1980), is one of the larger countries in the Third World. Moreover, it has a large national
family planning program, as well as a sizable private sector providing methods of birth control to the people. The National Family Planning Program of the Ministry of Public Health quite recently has been heralded as an important success in the international arena (Bogue and Tsui, 1978; Potts, 1979; Knodel, et al., 1980). A rapid decline in fertility appears to have started only somewhat more than a decade ago and has been backed up convincingly with data only in the last few years. The marital fertility rate has dropped dramatically (almost 40%) between 1969, the approximate onset of the government program, and 1979 (Knodel, et al., 1980) and the decline appears to be persisting (Westinghouse, et al., 1978). Concomitant with this decline, "the proportion of women using contraception has more than tripled: from 14% in 1970 to 37% in 1975 to about 50% in 1979" (Knodel, et al., 1980, 84). New acceptors in the national program have continued to escalate with each passing year and for 1979 "exceeded one million, or 18% of the eligible couples of reproductive age (perhaps one of the highest such rates in the world)" (Varakamin, et al., 1980, 349). Approximately 77% of current family planning users (1978) report the national family planning program as their source of supply (Westinghouse, et al., 1978), and many observers agree that the government program's impact has been significant (Knodel, et al., 1980; Hogan, 1978; Porapakkham, et al., 1979).

The relative "success" of family planning in Thailand presents an important case study for in-depth investigation of the public as well as private delivery systems. It is particularly interesting in that
fertility decline and increased usage of family planning have taken place without profound "modernization" or socio-economic development (Knodel, et al., 1980). Moreover, fertility declines have been even more rapid in the poorer regions of the country (Porapakkham, et al., 1979). Especially remarkable are the rapid declines very recently reported in the traditionally very poor and "backward" Northeastern Region. These trends present important evidence that socio-economic development need not precede fertility decline and suggest the need to look elsewhere for reasons, possibly at changes in accessibility to family planning and aspects of the culture.

Relevance of the Present Study

Recently, one of the major innovative institutions in population/family planning, the Population Council (The Population Council, 1981; Zeidenstein, 1980), set forth two major priorities for research in family planning programs. One, to focus on successful demonstration projects and programs, has been facilitated by the comprehensive comparative review of family planning diffusion strategies in Appendix B.1 in this dissertation. The only other background work of comparable breadth is Cuca and Pierce's (1977a) study for the World Bank.

A second priority stressed the need for family planning evaluation work to concentrate more on the "user perspective" as well as include private sector service and supply outlets. This the present
dissertation has done. In fact, the "user perspective" is tested for its relevancy to family planning programs along with the supplier perspective and the two other major components of the Family Planning Transaction. The present analysis, in specific, provides suggestions regarding the relative importance of the Thai government program (the supply side), characteristics of the users (the demand side), the setting (the effects of socio-economic development), and the gap (social and institutional barriers between the provider and potential user). The analysis may also suggest whether the local people would find access to family planning through the private system if the government program did not exist. Stimulation of the private system, if viable, would be clearly a cost-effective option for a national fertility policy.

Chapter Summary and Outline of Chapters to Follow

This chapter has reviewed the basis of the dissertation, problems and gaps found in past research in family planning, and two conceptual models devised to overcome some of the present limitations of the field. Finally, we mentioned the importance of the study country, Thailand, in the context of present controversies in the literature.

Following this introductory chapter, the dissertation proceeds with six more chapters: the first three background oriented, the next two analytical, and a final summary and conclusions chapter. Chapter II discusses the characteristics of family planning in Third World countries. This includes a sketch of the historical evolution of the
family planning movement and its incorporation into large national family planning programs, and a discussion of alternative administrative organization and delivery strategies. In Chapter III the main facets of family planning are synthesized through a general model of family planning viewed in a diffusion context. A second conceptual model, The Family Planning Transaction Model, then sets the stage for the major hypotheses to be tested on the micro-level. Chapter IV introduces the reader to the particulars of the country situation in Thailand, as well as the specific delivery systems for family planning there. It also describes the data set employed in this dissertation. Chapter V introduces the principal analysis. The framework of the Family Planning Transactional Model serves as a guide for hypothesis testing, and is used to review the pertinent literature and justify the selection of the independent variables. Chapter VI then discusses the results of the discriminant analysis and Chapter VII, the summary chapter, presents the conclusions as well as the policy implications and possible directions for future research in family planning.
CHAPTER II

FAMILY PLANNING: AN HISTORICAL OVERVIEW
AND A REVIEW OF THE LITERATURE

This chapter defines family planning and reviews the historical evolution of the family planning movement since its beginnings more than a century ago. Following that, it discusses the administrative and organizational structure of national family planning programs, giving emphasis to family planning in the Third World context. Finally, there is a summary of the important delivery strategies for family planning being employed by such programs over the last three decades.

Family Planning: A Definition

Family planning is frequently a euphemism and is almost always subject to a variety of interpretations. Nonetheless, there is growing consensus of the scope of activities ordinarily encompassed by the term, viz., programs primarily involved in establishing, maintaining and evaluating delivery systems for the supply of contraceptive methods (e.g., pills, injections, intrauterine devices and sterilization).
Often the programs oversee special projects as well as motivate new family planning acceptors through information, education and communication (IEC). Family planning, however, is not synonymous with birth control, for many family planning organizations have been very reticent to become involved with abortion. Lastly, even though family planning definitely connotes helping couples achieve desired fertility, in practice family planning programs in the Third World have shown little interest in aiding sub-fecund couples. Rather, the programs are aimed toward "population control," "birth limitation," or "birth control." Possibly in this sense "family planning" can be admitted to be a misnomer, nevertheless the term is used throughout this dissertation for it is overwhelmingly the most commonly accepted term in international circles today.

In summary, a one-sentence definition of family planning might read: those activities and programs, both public and private, to accelerate acceptance of both norms and methods for controlling one's family size. The extent of these activities and programs will be more fully amplified in the last two sections of this chapter. We will first trace the different motivating goals and purposes of the family planning movement throughout the last century.

Dominant Themes in Family Planning: An Historical View

The recent trends in family planning are in part a reflection of the historical evolution of the movement. Nascent social activism of
the Malthusian League in England brought birth control to wide public attention in the 1870s, and by the early years of this century Margaret Sanger and other Americans began advocating birth control for such reasons as "class struggle," sexual liberation and women's rights. Too radical for the times, these issues soon took a backseat to more palatable arguments: the eugenicists' hopes for improvement of the nation, race, or "civilization;" and the physicians' concern for individual welfare (Stycos, 1977, 10). These two camps vied for leadership in family planning in the 1920s and 1930s with the medical profession finally taking over responsibility to prevent a quasi-medical technology from passing into non-medical hands. The eugenics movement was largely dissipated in the 1930s as a result of scientific criticism and its perceived association with Nazi policies (Stycos, 1977; Kiser, 1981). The more academic approach of the eugenicists was picked up by the "population movement" and carried on by early demographers; however, the implementation of family planning now rested in the hands of the medical profession which was content simply to add it to the list of regular doctor's chores. There was little interest in mass provision of either contraceptive supplies or information (Stycos, 1977, 8); however, an interaction between the population movement people and the medical profession continued and kept the family planning issue from being buried within the doctor's clinic.

In the early 1950s mounting national and international concern over the effects of over-population was evidenced through the founding of both the Population Council, a leading international agency in
population/family planning, and the International Planned Parenthood Federation (IPPF), the international consolidation of private family planning programs around the world. At about the same time, the first population policies and programs were being formulated in the large developing countries of India (1952) and China (1956). The 1960s round of national censuses showed higher population growth rates than expected in many countries, and worldwide concern began to focus more on how to slow the large increasing rates of population growth.

With the concomitant rise of national family planning programs to importance and the infusion of large amounts of aid for population control by international donors, the medical profession became progressively more active in the wide-scale distribution of contraceptives, and the two opposing historical viewpoints resurfaced. The "public policy" or "medical" group stressed the importance of improved access and receptivity to modern contraceptive knowledge and technology for facilitating fertility decline, while the "nomological" or "behavioral" school of thought (descended from the "population movement") argued that changes in historical, cultural, economic and social factors, relations and patterns were most important (Weinstein and Ebot, 1976). These two views, henceforth labeled the "contraceptive availability" and "societalist" schools of thought, respectively, are very much a product of each camp's perspective, or if you wish, vested interest. Simply put, it seems logical that a sociologist would place greater significance on societal factors, as would a physician likewise claim the importance of access to medical technology.
When the "contraceptive availability" proponents began reporting that national family planning programs (for example, in Taiwan, Hong Kong, and Korea) were helping bring down fertility rates, the "societalists" expressed grave doubts over the direct effects of government programs and pointed out other variables, such as the social setting and the extent of modernization of a country, to be more important. Further evidence showed that several countries actually had witnessed a decline in fertility prior to the initiation of a national family planning program (for example, in the case of Taiwan, see Li, 1973). Given these facts, the "societalist" school presented the more convincing case, and in time, gained a good deal of momentum.

The debate culminated at the World Population Conference in Bucharest in 1974 and the "societalists," spoken for now by the official delegations of the Third World, carried the day. The official American proposed draft Plan of Action which emphasized the need for population limitation was changed to pleas for greater economic development and productivity. The explicit aim of the World Population Conference in its final version read, "to help coordinate population trends of economic and social development." The lasting effect of the conference therefore was to assert the importance of including societal development goals in fertility reduction programs. It did not diminish the emphasis of the United Nations on fertility reduction programs, but rather gave general acceptance to the idea that population decline is best facilitated by a two-pronged approach encompassing both schools of thought.
If one considers the debate still in progress, however, recent evidence of success in large national family planning programs in countries such as Colombia, Costa Rica, Indonesia, and Thailand (Potts, 1979; Bogue and Tsui, 1978) at least partly vindicate the family planners. Nevertheless, whether or not "family planning programs offer the most reasonable means of reducing growth rates" is still a question on which professional demographic (PAA) opinion is clearly divided (Toney, et al., 1981, 165). However, putting the past in perspective, today the historical debate may be seen as of lesser importance for the arguments and more for the widened conceptual breadth of focus it added to the field.

**National-Level Organization and Administration of Family Planning in Third World Countries**

Throughout this period of debate over the effects of national family planning programs on fertility, many new national programs were initiated while older programs were growing progressively larger in terms of sheer size. Although most programs were closely associated with a country's ministry of health, several variations of national-level administrative structure came into existence. This portion of the chapter will relate, first, the early evolution of the organization arrangements for family planning programs and, second, the types of national-level administrative structure found in Third World countries today.
The Evolution of Early Family Planning Organization and Administration

Before the widespread growth of national family planning programs in Third World countries in the 1960s, private agencies (most notably affiliates of the International Planned Parenthood Federation) pioneered efforts to set up family planning services (Corsa, 1975). These smaller, though active, non-governmental programs played an important role in catalyzing local recognition and support for family planning services on a national level. Some of the better established private programs (with British ties) laid the groundwork for national programs in countries with recent rapid fertility declines (e.g., Hong Kong, Fiji, Malaysia, and Singapore). In general, the IPPF has had a policy of encouraging governments to take over private clinic networks when they reach a certain stage (IPPF, 1975). For example, the Family Planning Association of Hong Kong, ran a strong country-wide program until the government took over in 1973. Today, private agencies such as affiliates of the IPPF supplement national programs with experimental projects for the most part.

The initial development of administrative systems for national family planning programs was varied and often of "Rube Goldberg" design. Development of programs depended upon the whims and preferences of closely-involved administrators, well-disposed national leaders, and non-governmental family planning work already in operation, and administrative arrangements for the program were tailored to accommodate the influential personalities and the existing bureaucratic structures.
and capacities. The interplay between foreign donor agencies, indigenous family planning advocates and political elites which led to the adoption of a national family planning program has been documented closely (Schwartz-Barcott, 1978).

Family planning programs also took on diverse forms in different countries because, in hopes of getting quick results, there was often dramatic program expansion over short periods of time. This necessitated utilizing the bureaucratic plan most effective, yet feasible, given the local capabilities. This variability in early program structure worldwide was beneficial in that it allowed flexibility according to the national situation. On the other hand, however, some administrative schemes often were based on short-sighted judgements and failed to serve the long-term needs of the country or to anticipate the ramifications of their actions.

Types of National Family Planning Program Organization

The different types of administrative umbrella for national family planning programs in the Third World that have emerged can be classified into five groups. To distinguish between these it is easiest to view them in relation to the ministry of health since by 1975, 84 of the 93 nations with a population policy or official support of family planning had family planning more or less integrated into the maternal and child health or general health services of the ministry of health (Gold, 1975). The five groups are:

1) Governmental, within the ministry of health
2) Governmental, outside of the ministry of health (e.g., in another ministry)

3) A national coordinating board

4) Quasi-governmental (part government controlled, part private)

5) Under private auspices

These types of administrative organization will be discussed in turn.

**Governmental, Within the Ministry of Health.** When there is already a well established health network throughout the country, introduction of family planning programs usually has been through the ministry of health. This happened in Sri Lanka, Malaysia, Thailand and Korea, as well as in many other countries. Such a situation has the advantage of working in an already established system with the potential of bureaucratic efficiencies. Training personnel is usually easier and cheaper, and a health worker with a broader health and medical background will probably be more effective in trying to explain family planning to the local people. However, there are the disadvantages of inheriting a bureaucracy not amenable to taking on further activities, of accepting health workers already alienated from the local people, or of using a system which may divert its specialized personnel assigned to family planning and maternal and child health to other tasks (as happened early in the program of the Republic of Korea, ECAFE, 1966).

**Governmental, Outside the Ministry of Health.** National family planning programs also can be coordinated through ministries other than health, or through a newly created central apparatus outside the control
of the ministry of health. Such was the case in Pakistan where the national family planning program was created as an administratively independent agency. In contrast, India approached family planning as a health matter and created a new organizational apparatus within the Ministry of Health and Family Planning, but operated programmatically through the state and local health systems. Finkle (1971) felt the Pakistani approach superior, but, program trends since the bifurcation of Pakistan show the Indians to be making more progress towards fertility reduction.

A further example of non-ministry of health national organization is in Ghana where family planning is under the Ministry of Finance and Economic Planning. This placement reflects, at least in part, their concern over family planning as part of the social and economic development program. This approach has proven beneficial in that the Ministry of Finance and Economic Planning has been an influential ministry, but it also has proven a source of conflict, because of the uncooperativeness of the Ministry of Health whose infrastructure makes up an important part of the national family planning delivery system (Armar and David, 1977).

National Coordinating Boards. A third type of national family planning organization is an independent national coordinating board such as is found in the Philippines (POPCOM), Indonesia, (NRPCB), and Costa Rica (CONAPO). Such an administrative structure must centralize and coordinate an often fragmented national system. This can be an extremely difficult task. For example, POPCOM, from a modest beginning
of overseeing a handful of family planning clinics in the mid-sixties, was in charge of 2,600 clinics by mid-1975 (Conception and Smith, 1977). The coordination and logistics of this program have become tremendous and very time-consuming tasks, for administration is controlled at an intermediate level by about forty separate private and public agencies throughout the country.

**Quasi-Governmental Structure.** The fourth category, quasi-governmental, exists where there are large programs, both public and private, functioning rather independently. A good example of this is the family planning program in Colombia, where there are two large sources of control, the maternal and child health division of the ministry of health in the government and the PROFAMILIA program in the private sector. There is also the coordinated program of the university hospitals, ASCOFAME, as well as a number of smaller organizations. The three major programs contributed 53%, 43%, and 4%, respectively, of the national family planning program acceptors (Sanin, 1976).

**Completely Private Sector Programs.** The fifth category of family planning organization, completely private, is becoming increasingly scarce because most Third World governments tend to take over programs when they reach a certain magnitude and because of the increasing international respectability and funds which accompany a national family planning program. Jordan's program is still reportedly privately coordinated (Palmore and Park, 1973), while other privately coordinated programs have been more recently transferred to the government sector, as was the case of the Venezuelan Family Planning Association in 1975 (Cerrutti and Kar, 1975).
Other Considerations. Finally, there are a few Third World countries with no actual family planning organization or a deliberate policy against family planning. Although such countries are few, examples include the Ivory Coast, Saudi Arabia, some smaller Arab countries, as well as most of the small countries in Francophone Sub-Saharan Africa (Watson, 1977). In South America, the extreme pro-natalist policy of Argentina has gone so far as to bar all family planning activities (IPPF, 1975).

National Family Planning Delivery Strategies in the Third World

The previous section has been limited to discussing the evolution of national-level family planning administrative structures from their somewhat diverse beginnings about two decades ago to the present trend of fairly close integration with their government's public health administrative network. There are many other important aspects of national family planning program administration not presented here: for example, the articulation of population policies (which has been thoroughly outlined in Stamper's (1977) review) and problems of management, coordination and effectiveness within the bureaucracy, a somewhat neglected topic (Korten, 1976a, 1976b; Gorosh, 1978). More important, however, in terms of this study is the discussion of family planning delivery strategies. Similar to the discussion of national-level family planning administrative structures, the section will respectively present the recent historical evolution and a typology of national family planning delivery strategies.
The Evolution of Delivery Strategies

The general trend of changes in national family planning delivery strategies in the Third World has been summarized by Rogers (1973, 84-98). He notes three sequential periods: the Clinic Era (pre-1965), the Field Era (1965-1970), and the Contemporary Era (post-1970). Although these dates can only be considered as approximate, they point out two early dominant family planning delivery strategies which today are a part of a more diversified group of strategy options.

The Clinic Era marked the start of a national family planning program through a coordinating administrative structure, usually the ministry of health, and organized through the national health clinic system. This era's conceptual model was the delivery system of the Western-type doctor-based clinics which received those clients who searched the clinic out. This system was soon found wanting as it was inefficient, not appropriate for many non-Western cultures, and failed to attract many clients. The medical profession was, in practice, seldom involved in seeking or motivating patients, and was unable to "create sufficient demand" for family planning as was evidently needed in developing countries.

Therefore, most programs soon moved into the Field Era where program stress was put on outreach through change agents and incentive payments. The programmatic strategy was based on the classical diffusion model, which had been previously used as a basis for agricultural extension and evolved from studies in Rural Sociology.
Rogers' third phase, the Contemporary Era (alternatively named the Beyond-Family-Planning Era) involved a fuller implementation of the Field Era with modifications of the somewhat rigid classical diffusion model. There has been a stronger emphasis on communication (including "motivation") and a recognition of the tremendous variability in cultures and need for adaptation of programs to local conditions. It also involved legalistic and persuasive campaigns to bring about societal changes, strategies associated with the beyond-family-planning approach (Berelson, 1969a).

Since Rogers' (1973) overview, there have been several new family planning delivery strategies implemented. Interest in improving the supply side of family planning led to an increasing diversity of strategies (such as locally-based distribution schemes), and contraceptive methods made available (the "cafeteria approach"). Family planning strategies have become more flexible in general and adaptable to specific country situations. However, many of the more recent innovative strategies often are only experimental programs and are not widespread in the majority of national programs in their day-to-day activities.

A Typology of Delivery Strategies

From an extensive review of family planning programs seven different types of family planning delivery strategies can be delimited:

1) Hospital/clinical approach,
2) Clinic extension workers,
3) Expanded role for paramedics,
4) Integrated programs (including postpartum/postabortion programs),
5) Mobile unit strategy,
6) Intensive camps, and
7) Locally-based distribution.

Because of their importance, these strategies have been reviewed in detail in Appendix B.1. In the remainder of this chapter they are briefly outlined.

Hospital/Clinic Approach. The hospital/clinic network is the traditional approach to family planning as well as government health and medical programs in general. Its implicit strategy is that family planning clients will seek out its services. All the other delivery approaches are attempts in some way to make family planning more accessible than this traditional clinic approach with its dependence on infrastructure.

Clinic Extension Workers. The second delivery strategy, clinic extension workers, is an offshoot of the clinic-based service facility. These workers have been called family planning field workers, motivators, canvassers, or other names, but have a common outreach strategy of home visits to encourage the use of family planning clinics. Usually such workers are responsible to or work out of a certain clinic or project. This strategy is theoretically predicated on the communication/diffusionist model of "awareness, information, evaluation, trial and adoption" of an innovation.
Expanded Role for Paramedics. Greater accessibility to family planning may be encouraged by permitting less complex family planning chores previously reserved to the medical profession to be done by government paramedics or traditional private medical practitioners. Examples of this are the use of nurses to insert intrauterine devices (IUDs) and the delegation of authority to government and private practitioners to prescribe and distribute the pill. As government paramedics usually operate out of a small clinic and private practitioners from their local (and often rural) practice site, this strategy most profoundly affects local-level delivery.

Integrated Programs. A fourth strategy integrates family planning service into a more comprehensive program with, for example, maternal and child health, nutrition or integrated development in general. Probably the best known of these integrated program strategies are the postpartum/postabortion programs which bring birth control to women soon after childbirth or abortion. This strategy is extensively used throughout the Third World, much of its impetus coming from the demonstration project, the International Postpartum Program (1965-1974), which provided family planning services for over one million acceptors in 21 countries. In the past this strategy has almost wholly been associated with large hospitals. In the 1970s, however, the Population Council initiated several experimental projects in rural areas of the Third World to provide both maternal and child care, and family planning by trained paramedics.
Mobile Unit Strategy. Another diffusion strategy is the mobile unit, "family planning on wheels," that is, mobile family planning clinics designed to bring service to the more remote and least accessible rural population. Most common is the use of jeeps or small motorcycles, although vans, bicycles, boats and airplanes have been used in this strategy. The roots of this strategy can be traced back at least two decades to the interest of some major international aid donors in importing mobile technology, especially jeeps, for several different types of development projects in the Third World. Today it appears this high technology strategy will be considered less favorably, given the increasing prices of vehicles and especially fuel.

Intensive Camps. The "intensive camp" is the least known and used of the diffusion strategies reviewed here. It is almost exclusively used in India for bringing large numbers of people to a site, usually for sterilization, the permanent method of birth control. The strategy is distinctive in its use of innovative incentives and the festive fair-like atmosphere the camps have.

Locally-Based Distribution. Lastly, there is locally-based distribution of family planning, the strategy probably furthest removed from the clinic approach and also, although possibly the most cost-effective, usually the least approved by the medical profession. This strategy involves the use of local, usually non-medical distribution networks ordinarily for pills and conventionals. The term "locally-based distribution" is employed to unambiguously encompass three similar diffusion strategies. These three strategies might be principally
differentiated on the basis of their financing: community-based distribution relies on local peoples, sometimes paid, sometimes volunteer; commercial-based refers to a market-oriented, usually drugstore, network; and social marketing involves a locally-based distribution plan with both private business and government cooperation and support.

Chapter Summary

This chapter presented an overview of family planning in Third World countries. First, the term "family planning" was defined and the scope of national family planning programs was delimited. Second, the philosophical roots of family planning were traced through a somewhat controversial past century to the more recent "contraceptive availability/societalist" debate. Third, the early administrative arrangements for family planning were discussed, and then the present national-level structure was classified into five categories based on a program's connections to the local ministry of health. Lastly, changes in family planning delivery strategies were traced through Rogers' (1973) Clinic, Field and Contemporary Eras, and then summarized into seven distinct types. A detailed review of these seven strategies can be found in Appendix B.1.
The purpose of this chapter to show how the ideas, activities, and research under the rubric of "family planning" can be knit together with two conceptual models. The discussion of the first model, the General Model of Diffusion of Family planning, begins with an overview of two antecedent models, the classical model of diffusion of innovation, and the market and infrastructure context of diffusion. These models lead to the General Model which is then discussed and shown to integrate the various aspects of family planning as parts of a macro-level process. The second model, the Family Planning Transaction, emanates from a part of the first and concentrates on the context of utilization of family planning on the individual level. It serves as a framework for organizing literature pertinent to the utilization of family planning in Chapter V and for testing the principal hypotheses of this study in Chapter VI.
The General Model of Diffusion of Family Planning

Family Planning and the Classical Model of Diffusion

The classical model of innovation diffusion has underlain family planning program strategies and research since the late 1960s. Specifically, clinic extension strategies involving family planning field workers, family planning recruiters with incentive payments, and emphasis on home visiting were all predicated at least implicitly on the classical diffusion model. Several of these strategies have led to large projects, for example, the recent nationwide project in the Philippines which hired approximately 2,600 "Full-Time Outreach Workers" in 1977 (Laing, 1981).

In brief, the classical diffusion model considers: 1) an innovation, 2) its communication via mass media, interpersonal and other channels, 3) over a period of time, 4) to members of a social system (Rogers, 1973, 76). Adoption involves a decision-making process in which individuals can accept or reject the innovation. This process has traditionally been outlined in five stages, each distinct in time: awareness, interest, evaluation, trial, and adoption of the innovation (Bohlen and Beal, 1962). The model is essentially aspatial, i.e., without the geographer's emphasis on distance and proximity.

The classical diffusion model was helpful in freeing family planning delivery from the narrow confines of the clinic approach, but "however useful this simple-minded view of diffusion has been for [agricultural] extension agents, it probably has done more harm than
good for family planners" (Stycos, 1977, 19). With its emphasis on the importance of interpersonal communication in the adoption process, the model encouraged extension policies from the clinic base to the neglect of mass media campaigns, locally-based distribution schemes and other delivery systems. Further, interpersonal delivery and communication methods, especially when tied to a clinic system, can be quite costly, necessitating large staffs of extension workers. Moreover, no one has ever shown interpersonal communication schemes to be more cost-effective than other strategies.

With increasing evidence of the classical diffusion model's conceptual restrictions, departures have occurred. Specifically, certain researchers (e.g., Harvey and Altman, 1973; Black, 1976) started to look towards the diffusion propagator and the strategy choices available to it. Several looked to the field of marketing with its emphasis on logistics, product demand creation, motivational communications, and action-oriented research and evaluation. The work of Roberto (1975a, 1975b, 1977) is exemplary in its application of the market and infrastructure context of adoption to the planning of a nationwide condom distribution plan in the Philippines. Some have advocated increased use of commercial-based family planning distribution through already existing private commercial networks (Black, 1973; Sweeny, 1973; Harvey and Altman, 1973). Governments of countries, such as India (Jain, 1973; Sinha, 1973) and Sri Lanka (Davies and Louis, 1976), collaborated with the private sector in schemes based on social marketing, the use of marketing techniques to further social as distinct
from commercial objectives (Kotler and Zaltman, 1971). Also, several community-based distribution plans have been implemented, using a large network of volunteer distributors of condoms, pills and conventional (e.g., Viravaidya, 1974, 1976; Davies and Rodriguez, 1976). Along with these radically different delivery strategies for the propagation of family planning, closer attention has been given to the evaluation of administration/organization of the diffusion agency in hopes of making it more efficient and effective. Examples of this are Gorosh's (1978) recent review of evaluation techniques and strategies for improving family planning management and Korten and Korten's (1977) training casebook presenting the major issues of family planning management.

The Market and Infrastructure Context of Diffusion

A conceptual digression parallel to these new strategies has been the market and infrastructure model of the diffusion of innovations (Brown, 1975, 1981). This model turns away from past emphasis on the adoption context, the focus of the classical diffusion model. It facilitates a wider overview of family planning by also considering two antecedent processes: the establishment of the diffusion agency (propagator) and the diffusion strategy. "The market and infrastructure perspective focuses upon the ways innovations are made available to potential adopters or, alternatively, the ways potential adopters are provided access to innovations" (Brown, 1978, 17). While adoption deals only with the "demand" for the innovation, the diffusion agency establishment and strategy conceptually enables us to also consider "supply."
This widened perspective of diffusion points to several policy considerations pertinent to family planning. The necessary extent of central control over the diffusion process might be questioned. One might ask if the diffusion process has been constrained by the propagator's (government) infrastructure depending on where and when diffusion agencies (family planning facilities) were set up. Logistics, distribution and promotion to make family planning accessible become important strategy considerations. New tools can be suggested, such as marketing strategies and the use of existing commercial marketing networks in lieu of creating new infrastructure. In addition, the appropriateness of certain major corollaries of the classical diffusion model might be called into question. The differences in adoption time for "laggards" may not be accountable to an individual's lack of "innovativeness," but rather to differences in when and where the diffusion agency comes to an area or that the potential adoptor lacks the resources to obtain or advantageously use the innovation. In sum, with the market and infrastructure context of diffusion there is greater recognition of 1) the role of infrastructure, both public and private, 2) marketing strategies, and 3) the societal conditions or context of diffusion.

At this point some precaution should be voiced over the possible unconstrained adaptation of conceptual diffusion models to family planning. It may be argued that the process of diffusion of family planning is a unique process, in many ways quite different from the more simplistic diffusion of farm innovations which has occupied much of the
past diffusion literature. Such complexities specific to family planning have recently been discussed by Lin and Hingson (1974), Blaikie (1975), and Lin and Melnick (1977). More obvious examples of these complexities are that family planning often requires continued use over a regular period of time, is often not considered a desirable innovation, involves a number of competing devices for the same purpose, and entails changes in behavior which are sensitive and deeply interwoven in societal norms. Despite these complexities, however, family planning can still be studied as a diffusion process if we take account of these differences.

The General Model of Diffusion of Family Planning

Adapting the market and infrastructure perspective of diffusion to family planning, a general model of the diffusion of family planning is constructed with six elements important to a diffusion process sponsored by the public sector: 1) technological development of the innovation, 2) preconditions or setting, 3) a diffusion agency, 4) diffusion strategy, 5) the adoption process, and 6) the ramifications, or feedback, of the whole process (adapted from Brown, 1981). Figure 3.1 shows this model of diffusion within the context of a national family planning program.

Given the technological development of an innovation, diffusion processes will take place within a setting, in the present case, the sociocultural, economic and political environment of a country. This also is important in terms of the extent of physical space, a factor
crucial to spatial diffusion processes and to the number of geographical scales upon which the diffusion process may eventually take place. Within the setting the diffusion agency must be established and devise effective strategies to diffuse family planning so as to facilitate adoption by the population, the goal of our public sector diffusion agency. The diffusion process may bring about certain changes in the setting, for example in terms of contraceptive behavior and fertility norms of the community. These effects, in turn, feed back into the whole system to affect changes in the social setting in which the diffusion process takes place. The process is dynamic, ever-changing within the social setting which is itself also changing. It is also dynamic in that new technological developments, for example, new contraceptive devices, can change the system.

The major topics within family planning fit into the General Model of Diffusion of Family Planning and have been included in Figure 3.1 in parentheses under one of the six principle elements in the diffusion model. These topics include:

1) the effects of socio-economic variables on fertility and family planning,
2) population policy and laws,
Figure 3.1. General Model of Diffusion of Family Planning.
3) organization, administration and management of programs,
4) service delivery systems,
5) information, education and communication (IEC),
6) incentives for acceptance,
7) research and evaluation, and
8) development of better fertility regulation techniques.

These topics and their relationships in the model are discussed respectively in some detail in the following paragraph.

The setting for the diffusion process contains the socioeconomic milieu which the "societalists" have argued as most important in facilitating changes in fertility behavior. The setting also embraces the existing laws and population policies which can influence fertility behavior and contraceptive availability. The establishment of a diffusion agency involves the organization of and ongoing problems in administration and management of a family planning program. The agency's diffusion strategy will determine what mix of different methods and delivery approaches will be best for carrying out the family planning program and for facilitating adoption. Information, education, and communication (IEC) programs and incentives may also be used to accelerate the adoption process. Success or failure of the program will usually be evaluated taking the number and composition of the acceptors into account, as well as the cost-effectiveness of the program.

Finally, the total effects of the diffusion process may be examined to look for changes in the setting or a possible decline in fertility, and
the reasons behind these changes. The search for technological improvement in contraceptive methods feeds into the whole process by providing or improving the innovation (family planning method) which is being diffused.

This General Model of Diffusion of Family Planning has several ramifications as well. It encourages flexibility in connection with the market and infrastructure context of diffusion. For example, changes in the composition of family planning clients over time in the different stages of a national family planning program's development may be interpreted as requiring different diffusion strategies to focus on new segments of the "market". In practice, however, few governments have integrated the most appropriate approaches into their programs, given their public and private resources. In addition, the model helps policy makers to focus on the complexities of interaction between the diffusion agencies and the potential adopters, a subject often overlooked.

This dynamic model of the diffusion of family planning subsumes the main issues in the forefront of family planning for the last two to three decades. The model can succinctly encompass the conceptual breadth of the family planning debate, allowing the family planner, public policy maker or researcher to think in terms of the complete process which is taking place. Seen in this light, arguments over the importance of the social setting or delivery system as the key determinants of fertility reduction pale: they are indeed part and parcel of the same process.
Having discussed the General Model of the Diffusion of Family Planning, the chapter now reviews the second conceptual model, the Family Planning Transaction Model. Going from the first to the second conceptual model is a logical step from a macro-model to a micro-model, or, said another way, a general model to an individual-level model.

The Family Planning Transaction Model

Introduction

The Family Planning Transaction Model is in some ways a microcosm of the General Model of Diffusion of Family Planning. In particular, it elaborates principally on three parts of the General Model: the family planning propagator, its diffusion strategy, and the adoption process. The Transaction Model is concerned with the individual's decision of why and where to obtain family planning. This, in turn, is related to the government's family planning agency establishment policies and strategies on one hand, and whether or not adoption will take place on the other hand. In addition, the transaction similarly takes place in a societal context.

The Need for the Model

There have been many approaches to understanding peoples' family planning utilization patterns. Some researchers have been primarily interested in the factors behind differential fertility, that is, large or small families. Policy makers, on the other hand, have been more
frequently concerned with finding appropriate family planning delivery strategies or the optimum organization of infrastructure and personnel. Others have viewed the issue in the context of similarities and differences between family planning users and providers. Others yet have argued that the important consideration in family planning use and fertility decline is the level of socio-economic development and that access to family planning methods is, at best, secondary to the issue.

To a certain point, all of these approaches are valid. However, these divergent emphases can, in fact, be seen as part of one process, the Family Planning Transaction. To this end, this section presents the Transaction Model in which the utilization literature can be organized and with which a more comprehensive framework is provided for research to focus on the processes underlying peoples' acceptance and use of family planning.

The "Transaction" and Family Planning

The proposed model of the "Family Planning Transaction" (Figure 3.2), drawing from the ideas of Dewey and Benton (1949) and others, encompasses the interactions between four important elements: the potential user, the potential provider, the gap or distance between them, and the setting or context in which the family planning transaction takes place. This holistic approach integrates the different emphases within the field of family planning, stresses their interreactions with each other, yet allows us to research the relative importance of each.
Figure 3.2. A Model of the Family Planning Transaction: The Basic Components and Some Important Descriptors.
However one conceives of the family planning utilization process, most likely two basic actors will be considered first: the potential family planning user and the family planning provider or, in the framework of the market economy, the demand and supply sides. Utilization is that process, or transaction, that takes place between them. In addition, both the potential user and provider have particular characteristics of descriptors as well as a "distance" or gap between them. Two types of gaps may prevent or hinder the transaction from taking place: there may be opportunities to obtain family planning from an "intervening provider" or there may be barriers, such as social or physical distance, which are too great to overcome. The physical, social, and communication gaps between the potential family planning seeker and provider in large part determine whether a transaction will occur. These physical and social distances can be of varying length, which is symbolically portrayed in the model's analogy of an accordion. Lastly, the overriding context or setting in which any transaction takes place is very important, often crucial to whether the transaction occurs or not. An example of a favorable context for the family planning transaction might be one where the elite of a community encourage smaller family norms or where economic opportunities exist for the more mobile, smaller families.

Although this model emphasizes the importance of all four components of the family planning transaction, the interaction and ongoing process are stressed even more. This serves to remind us of the importance and interconnectiveness between the supply and demand sides.
of family planning. Use of a certain family planning provider is not predicated only on his characteristics or, on the other hand, the potential user's characteristics. Both sets of characteristics, their interaction, as well as the context within which the transaction takes place, combine to make family planning more or less accessible, and promote the family planning transaction.

The concept of transaction, in short, emphasizes the whole process and a possible synergistic end-product of an action. The transaction in our case involves the process of a person perceiving a need for family planning and then obtaining it from a provider. Viewing this process as a transaction does not preclude identifying characteristics (or interactions) of different elements of the process or associations which describe their relationship. This is, in fact, very helpful in empirical analyses. The transaction concept, however, affirms the transcendence of the process viewed holistically as the description of the action taking place. The "truth" (reason or explanation) of an action is the transaction from beginning to end without final credit attributed to the different elements.

Using such a model we can examine both the seeker and provider and how they affect one another. As obvious as such an approach may appear to be, much family planning utilization research has chosen to ignore one side or the other, as well as their relative differences and settings. For example, early utilization studies often only collected data on users' characteristics (often as an adjunct to the main purpose of research), seldom comparing them to the whole population or reaching
any understanding of differences between users and non-users. Other studies, searching to improve family planning service, often concentrated on characteristics of the personnel and disregarded the individual potential acceptors of their communities. Few studies have focused on differences between providers and potential users, or the influences of the setting or community. Hardly any research has simultaneously considered all four elements of the family planning transaction.

Summary

The Family Planning Transaction Model has provided a widened frame of reference for integrating the processes underlying family planning utilization. On a more universal level, the General Model of Diffusion of Family Planning did the same for family planning. The chapter concentrated on describing both conceptual models and their usefulness in tying together ideas and topics in family planning. In particular, their philosophical roots were detailed: the intellectual debt of the General Model of Diffusion of Family Planning to the market and infrastructure context of diffusion (Brown, 1975, 1981) which expanded on the classical model of diffusion, and the Family Planning Transaction Model's use of "transaction" (Dewey and Benton, 1949).

Together, these two models provide a framework for this dissertation. The General Model of Diffusion of Family Planning pulls together the vast range of general family planning writings. This was
of particular importance in Chapter II. The Family Planning Transaction Model organizes the range of ideas and studies relevant to the utilization of family planning, which are reviewed in detail in Chapter V. The model also serves as the framework for the analytical testing of hypotheses in Chapter VI.

Changing direction, the dissertation in the next chapter provides the reader with a description of the country under study, Thailand. First, a general overview of the country is presented. Second, the historical involvement of the Thai government in family planning is detailed. A description of private family planning activities in Thailand follows and, finally, an overview of the survey province and its family planning network is given.
CHAPTER IV

FAMILY PLANNING IN THAILAND: AN OVERVIEW

OF THE COUNTRY AND THE SURVEY PROVINCE

To provide a context for the upcoming analysis, this chapter presents background to family planning in Thailand and the study province, proceeding from very general information to the specific. First, a broad overview of the country sets the regional context. Second, the population of Thailand is described and, third, fertility and family planning are detailed with special reference to the recent and rapid fertility decline there. Fourth, the historical involvement of the Thai government in family planning is reviewed and then, the various family planning delivery strategies are respectively outlined for: the government Ministry of Public Health program, government agencies outside the ministry and the private sector. Lastly, the reasons for the choice of the survey site, Suphanburi Province, are discussed relative to the national situation for health care and family planning provision.
General Country Overview

The Kingdom of Thailand, once known as Siam, is situated in the center of peninsular Southeast Asia. Located between the latitudes of 5° and 21° north of the equator, it is in general a land of year-round warmth with a moderate range in seasonal temperatures. The monsoon and lesser cyclical winds closely affect the weather, bringing heavy seasonal rains to much of the country, as well as year-round rain to other parts, such as the southern peninsula (Donner, 1978). The weather plays an important role in Thailand with the predominantly rural population and prosperous agricultural export sector. Close to 80% of the people work in agriculture, while two out of every three households earn their living by rice farming. Thailand has historically been an important rice-trading nation and presently is the world's leading exporter (Far Eastern Economic Review, 1982); however, in the past decade exports of sugar, corn and cassava have also risen to prominence with the diversification of agriculture (Pongprayoon, 1979). These crops, along with the traditional export earners of the South, rubber and tin, form the backbone of the economy. Rising world agricultural prices should prove beneficial to rural Thailand, especially since a large majority of the farmers are owner cultivators (Business Week, 1979).

Political strife in neighboring countries and the hackneyed specter of the domino theory have long overshadowed the steady progress of Thailand's agriculturally-based economy. A budding industrial sector
highly clustered in the Bangkok Metropolitan Area, as well as a major natural gas find in the Gulf of Siam, also bode well for sustaining the present 7% annual rate of real growth.

Thailand is characterized by an extremely primate system of cities. Booming Bangkok (population: 5 million) contrasts with provincial capitals of 20,000 to 100,000 people and smaller district seats of about 5,000 to 10,000 people. These smaller urban centers, despite regional growth pole policies, appear rather to be the foundation of a system of diffuse urbanization (Hackenberg, 1980). They function mainly as market and service centers, fairly adequately supporting the external needs of the rural people whose more traditional way of life focuses on the family, village, school and Buddhist temple.

Widespread basic education is reflected through literacy rates of 89% for males and 75% for females, with approximately 90% of women 15-49 years old completing at least primary education (Westinghouse et al., 1978). For a vast majority in the countryside, housing is adequate and the diet sufficient, except for certain areas, such as parts of the poorer Northeastern Region and the northern mountains inhabited by hill tribes people. Infant mortality rates were estimated at 56 per 1,000 live births in 1975 (Thailand, National Family Planning Program, 1977, 10). Health and living standards indicate Thailand to be among the somewhat better off, though certainly not the best, of the Third World countries today. Though there is not a wealth of consumer goods within the income range of the small farmer, basic needs are met and ambitious government programs with international aid are now expanding roads,
irrigation canals, electricity, as well as educational and health infrastructure. Though the rural sector can be considered relatively better off compared to many Third World countries today, "in a number of respects [rural] Thailand remains at a rather early stage of development as it is usually defined" (Knodel, 1978, 47).

**The Population**

In contrast to other countries of Southeast Asia, the Thai population has a remarkably ethnic and cultural homogeneity (ESCAP, 1976; Thailand, NFPP, 1977). Various smaller ethnic groups assimilate well into Thai society. The most notable of ethnic minorities are the urban Chinese, the Thai Malay of the South, and the colorful hill tribes people of the northern mountains, though they number only a few percent of the population. Thailand is a devotedly and overwhelmingly (95%) Buddhist country. This bond, along with a profound respect for the royal family, helps keep the country solidly unified. The only other religious group of note is the Muslim Thai Malay which accounts for approximately 4% of the population.

The present population of Thailand is estimated at 48.6 million (Haub, 1981), making it the 18th largest country in the world. Similar to the experience of most Third World countries, Thailand's population expansion has been primarily a twentieth century phenomenon. Previous to that, average death rates only slightly lower than birth rates kept the population increasing at low levels. The first official census of 1911 showed the population slightly above eight million (see Table
4.1). Steady decreases in the crude death rate throughout this century (see Figure 4.1), accompanied by persistently high crude birth rates, led to increasingly larger rates of natural increase. Up into the 1960s the growth rate of Thailand's population hovered above 3%, making it among the highest in the world. The population density has similarly increased from low levels to a moderate figure of about 95 persons per square kilometer today. Although farmers today still migrate to virgin land, such lands are becoming increasingly scarce and can no longer be viewed as a major outlet for rapid population growth.

**Fertility and Family Planning Behavior**

Over the past decade there has been growing evidence of a very rapid decline in fertility. Although data are still fragmentary, many sources have documented this decline. The crude birth rate, estimated at 40 and above by various sources in 1970, is now estimated as low as 28 (Haub, 1981). Other, more sophisticated, fertility measures document the decline. Age-standardized marital fertility dropped by 18% from the periods 1967-70 to 1973-75 (Knodel, 1978). The total fertility rates obtained from a number of surveys and, therefore, not strictly comparable, nevertheless clearly indicate a rapid decline (see Figure 4.2). The total fertility rate from the 1960 census was 6.65 while present estimates place it around 3.7. From the best available data (Knodel, 1978; Westinghouse, et al., 1978), it appears that the fertility decline began to accelerate in the late 1960s and has continued unabated. If this rapid decline in fertility persists,
Table 4.1. Total Population of Thailand: Official Census Counts, 1911 to 1980.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (1,000)</th>
<th>Average Annual Increase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>8,266</td>
<td>---</td>
</tr>
<tr>
<td>1919</td>
<td>9,207</td>
<td>1.4</td>
</tr>
<tr>
<td>1929</td>
<td>11,506</td>
<td>2.2</td>
</tr>
<tr>
<td>1937</td>
<td>14,464</td>
<td>3.0</td>
</tr>
<tr>
<td>1947</td>
<td>17,443</td>
<td>1.9</td>
</tr>
<tr>
<td>1960</td>
<td>26,258</td>
<td>3.2</td>
</tr>
<tr>
<td>1970</td>
<td>34,397 (36,117)*</td>
<td>2.7 (3.1)</td>
</tr>
<tr>
<td>1980</td>
<td>47,300**</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

*Upward revision of provisional census figures because of under-registration (NFPP, 1977).

**Estimated from Haub and Heisler (1980).

N.A.: Not Available.

Source: National Statistical Office; National Family Planning Program.
Figure 4.1. Crude Birth Rates and Crude Death Rates, Thailand 1920 - 1978

Figure 4.2. Total Fertility Rates Estimated by Four Studies of Fertility in Thailand.

Thailand may experience one of the most rapid fertility declines ever recorded for a major nation of the world. According to recently published comparative World Fertility Survey (WFS) data for around 1975 (see Table 4.2), Thailand is clearly emerging into that group of Third World countries with lower and rapidly declining fertility. Total fertility rates place Thailand sixth lowest of the 19 nations reporting (with the results of the very high fertility African countries not yet documented). The length of the open birth interval (the time from last birth to time of survey) in Thailand increased 11 months from 1969 to 1975 (Knodel, 1978) and in Table 4.2 compares favorably with the other countries. The open interval, though not without its biases (Hanenberg, 1980), still gives an indication of very recent fertility. Crude birth rates from most recent sources (Table 4.2) indicate Thailand third lowest among these Third World countries. Indeed, if the present crude birth rate of 28 is accurate, there are only nine major Third World countries with fertility levels lower than Thailand. Finally, if we had the data to accurately compare change in total fertility rates from 1970 to the present, the decline in Thailand would quite likely be among the most rapid in the world.

Coinciding with the drop in fertility, there has also been a fourfold increase in the current use of contraception from 14% of married women aged 15-44 to 55% in 1979 (Table 4.3). This places Thailand among the leading Third World nations in contraceptive prevalence, and at a rate close to many western countries. Compared to the 19 WFS countries, only three countries have higher rural prevalence
Table 4.2. Fertility Indicators for 19 Selected World Fertility Survey Countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>CBR&lt;sup&gt;a&lt;/sup&gt; (c. 1980)</th>
<th>TFR&lt;sup&gt;b&lt;/sup&gt; (c. 1975)</th>
<th>Open Interval&lt;sup&gt;b&lt;/sup&gt; (c. 1975)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordan</td>
<td>46</td>
<td>7.0</td>
<td>17.7</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>46</td>
<td>6.1</td>
<td>--</td>
</tr>
<tr>
<td>Nepal</td>
<td>44</td>
<td>6.0</td>
<td>22.7</td>
</tr>
<tr>
<td>Pakistan</td>
<td>44</td>
<td>5.8</td>
<td>23.2</td>
</tr>
<tr>
<td>Mexico</td>
<td>33</td>
<td>5.7</td>
<td>22.5</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>37</td>
<td>5.3</td>
<td>24.8</td>
</tr>
<tr>
<td>Peru</td>
<td>39</td>
<td>5.2</td>
<td>25.0</td>
</tr>
<tr>
<td>Philippines</td>
<td>34</td>
<td>4.8</td>
<td>25.4</td>
</tr>
<tr>
<td>Jamaica</td>
<td>27</td>
<td>4.5</td>
<td>35.4</td>
</tr>
<tr>
<td>Columbia</td>
<td>29</td>
<td>4.4</td>
<td>29.7</td>
</tr>
<tr>
<td>Guyana</td>
<td>28</td>
<td>4.4</td>
<td>28.1</td>
</tr>
<tr>
<td>Malaysia</td>
<td>31</td>
<td>4.3</td>
<td>30.8</td>
</tr>
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<td>Indonesia</td>
<td>35</td>
<td>4.2</td>
<td>32.5</td>
</tr>
<tr>
<td>Thailand</td>
<td>28</td>
<td>4.2</td>
<td>32.3</td>
</tr>
<tr>
<td>Korea</td>
<td>23</td>
<td>4.0</td>
<td>33.4</td>
</tr>
<tr>
<td>Panama</td>
<td>28</td>
<td>4.0</td>
<td>--</td>
</tr>
<tr>
<td>Fiji</td>
<td>28</td>
<td>3.9</td>
<td>34.5</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>32</td>
<td>3.5</td>
<td>--</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>29</td>
<td>3.5</td>
<td>33.3</td>
</tr>
</tbody>
</table>

Sources:  
<sup>a</sup> Crude birth rates (CBR) obtained from the 1981 World Population Data Sheet Reference Bureau, prepared by Carl Haub. The rates are the most recent available, presumably of the population around 1980.  
<sup>b</sup> Total Fertility Rates (TFR) and Open Interval data are from Robert Hanenburg, World Fertility Survey, Comparative Studies, Cross National Summaries, Number 11, 1980; Note: the time of survey varies from 1974 to 1976, except for Peru (1977/78) and the Philippines (1978).
Table 4.3. Percent of Currently Married Women Aged 15-44 Currently Practicing any Method of Contraception as Reported in Four National Surveys, Standardized for Age of Women.

<table>
<thead>
<tr>
<th>Survey</th>
<th>Rural</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitudinal Survey, 1969/70</td>
<td>10.5</td>
<td>14.4</td>
</tr>
<tr>
<td>Longitudinal Survey, 1972/73</td>
<td>22.8</td>
<td>26.0</td>
</tr>
<tr>
<td>Survey on Fertility in Thailand, 1975</td>
<td>34.9</td>
<td>36.8</td>
</tr>
<tr>
<td>Contraceptive Prevalence Survey, 1978/79</td>
<td>53.1</td>
<td>55.4b</td>
</tr>
</tbody>
</table>

a The age distribution of currently married women for the whole kingdom, as reported in the 1970 census, was used as the basis of the age standardization.

b Excludes provincial urban but includes Bangkok in twice the relative proportion of the rural areas.

c Rural round in 1969, urban round in 1970.


rates (see Table 4.4). Moreover, in the 3 years since the WFS in Thailand (1975), contraceptive prevalence rates have continued to increase while the rural-urban gap has started to close (Porapakkham et al., 1979). A further positive aspect of contraceptive use in Thailand is the Thai people's marked preference for the more efficient methods of birth control (Lightbourne, 1980). Finally, Table 4.5 shows continuation ratios for contraceptive use with Thailand among the highest of the 19 WFS countries.

The contribution of the Thai government National Family Planning Program (NFPP) to this momentous fertility decline is a disputed issue. Unofficial estimates by the Thai Ministry of Public Health suggest that two-thirds of all contraceptive users in 1976 obtained services from the NFPP. Data from the random sample survey of 2110 households for the present study indicate the total public sector contribution to be 64% at most in 1977 in a large Central Plains province. Nationwide survey data for 1978 reported 77% of all contraceptive users used government sources (Westinghouse, et al., 1978).

Several studies have attempted to evaluate the contribution of the Thai NFPP to the decline in crude birth rates (Teachman, et al., 1978; Hogan, 1978; Nortman and Bongaarts, 1975; Nortman, et al., 1978; Khoo, 1979). "Births averted" by the program were calculated by computer models which accounted for contraceptive continuation rates, age, and potential fertility of acceptors, as well as other family planning method-specific data. For the years 1964-75, Nortman, et al. (1978) estimated a decline of 8.3 points in the crude birth rate due to program
Table 4.4. Percentage of Exposed Women Currently Using Any Method of Contraception; Standardized by Age; Selected WFS Countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Principal City (1)</th>
<th>Other Urban (2)</th>
<th>Rural (3)</th>
<th>Principal City v. Rural Gap Ratio (1)-(3)</th>
<th>(1)/(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASIA AND PACIFIC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>41</td>
<td>21</td>
<td>10</td>
<td>31</td>
<td>4.10</td>
</tr>
<tr>
<td>Fiji</td>
<td>57</td>
<td>61</td>
<td>49</td>
<td>8</td>
<td>1.16</td>
</tr>
<tr>
<td>Indonesia</td>
<td>40</td>
<td>42</td>
<td>42</td>
<td>-2</td>
<td>0.95</td>
</tr>
<tr>
<td>Jordan</td>
<td>53</td>
<td>42</td>
<td>14</td>
<td>39</td>
<td>3.79</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>46</td>
<td>42</td>
<td>37</td>
<td>9</td>
<td>1.24</td>
</tr>
<tr>
<td>Malaysia</td>
<td>59</td>
<td>52</td>
<td>36</td>
<td>23</td>
<td>1.64</td>
</tr>
<tr>
<td>Nepal</td>
<td>39</td>
<td>16</td>
<td>3</td>
<td>36</td>
<td>13.00</td>
</tr>
<tr>
<td>Pakistan</td>
<td>26</td>
<td>17</td>
<td>4</td>
<td>22</td>
<td>6.50</td>
</tr>
<tr>
<td>Philippines</td>
<td>61</td>
<td>58</td>
<td>42</td>
<td>19</td>
<td>1.45</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>52</td>
<td>39</td>
<td>35</td>
<td>17</td>
<td>1.49</td>
</tr>
<tr>
<td>Thailand</td>
<td>62</td>
<td>59</td>
<td>44</td>
<td>18</td>
<td>1.41</td>
</tr>
<tr>
<td><strong>GROUP AVERAGE</strong></td>
<td>49</td>
<td>41</td>
<td>29</td>
<td>20</td>
<td>1.67</td>
</tr>
</tbody>
</table>

| **CARIBBEAN AND LATIN AMERICA** |                    |                 |           |                                          |        |
| Colombia                      | 70                 | 61              | 36        | 34                                       | 1.94   |
| Costa Rica                    | 83                 | 79              | 75        | 8                                        | 1.11   |
| Dominican Republic            | 57                 | 51              | 33        | 24                                       | 1.73   |
| Guyana                        | 45                 | 32              | 37        | 8                                        | 1.22   |
| Jamaica                       | 56                 | 46              | 43        | 13                                       | 1.30   |
| Mexico                        | 62                 | 53              | 21        | 41                                       | 2.95   |
| Panama                        | 72                 | 75              | 56        | 16                                       | 1.29   |
| Peru                          | 63                 | 49              | 17        | 46                                       | 3.71   |
| **GROUP AVERAGE**             | 64                 | 56              | 40        | 24                                       | 1.60   |
| **ALL COUNTRIES**             | 55                 | 47              | 33        | 22                                       | 1.67   |


Note: The time of survey for this data varies from 1974 to 1976, except for Peru (1977/78) and the Philippines (1978).
Table 4.5. Contraceptive Continuation Ratios for 19 Selected WFS Countries.3

<table>
<thead>
<tr>
<th>Country</th>
<th>Principal City</th>
<th>Other Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASIA AND PACIFIC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>.712</td>
<td>.579</td>
<td>.536</td>
</tr>
<tr>
<td>Fiji</td>
<td>.691</td>
<td>.674</td>
<td>.588</td>
</tr>
<tr>
<td>Indonesia</td>
<td>.730</td>
<td>.736</td>
<td>.734</td>
</tr>
<tr>
<td>Jordan</td>
<td>.621</td>
<td>.553</td>
<td>.398</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>.616</td>
<td>.615</td>
<td>.574</td>
</tr>
<tr>
<td>Malaysia</td>
<td>.751</td>
<td>.707</td>
<td>.652</td>
</tr>
<tr>
<td>Nepal</td>
<td>.585</td>
<td>.513</td>
<td>.559</td>
</tr>
<tr>
<td>Pakistan</td>
<td>.667</td>
<td>.542</td>
<td>.375</td>
</tr>
<tr>
<td>Philippines</td>
<td>.702</td>
<td>.674</td>
<td>.613</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>.790</td>
<td>.737</td>
<td>.745</td>
</tr>
<tr>
<td>Thailand</td>
<td>.812</td>
<td>.726</td>
<td>.724</td>
</tr>
<tr>
<td><strong>GROUP AVERAGE</strong></td>
<td>.699</td>
<td>.640</td>
<td>.594</td>
</tr>
<tr>
<td><strong>CARIBBEAN AND LATIN AMERICA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>.738</td>
<td>.725</td>
<td>.628</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>.827</td>
<td>.801</td>
<td>.785</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>.700</td>
<td>.680</td>
<td>.622</td>
</tr>
<tr>
<td>Guyana</td>
<td>.592</td>
<td>.410</td>
<td>.617</td>
</tr>
<tr>
<td>Jamaica</td>
<td>.664</td>
<td>.598</td>
<td>.583</td>
</tr>
<tr>
<td>Mexico</td>
<td>.729</td>
<td>.688</td>
<td>.588</td>
</tr>
<tr>
<td>Panama</td>
<td>.758</td>
<td>.803</td>
<td>.727</td>
</tr>
<tr>
<td>Peru</td>
<td>.689</td>
<td>.677</td>
<td>.563</td>
</tr>
<tr>
<td><strong>GROUP AVERAGE</strong></td>
<td>.712</td>
<td>.673</td>
<td>.639</td>
</tr>
<tr>
<td><strong>OVERALL AVERAGE</strong></td>
<td>.705</td>
<td>.654</td>
<td>.613</td>
</tr>
</tbody>
</table>

3 Ratios of percent currently using any method to percent ever using any method, currently married and fecund women, standardized on number of living children.

acceptors and Teachman, et al. (1978), 12 points. Such credit to the National Family Planning Program appears overestimated, for accurate credit to the private distribution of family planning cannot be accurately accounted for, although both Teachman, et al. (1978) and Khoo (1979) hazard some approximations. Also, the prevalence of abortion appears to have been severely underestimated (see Narkavonnakit and Bennett, 1981). The more important question, and one not approached by these studies, is: how many acceptors is the National Family Planning Program recruiting who would not have used family planning in the absence of a government program? The number is probably fairly substantial judging from the spatial pattern of new family planning acceptors, and fertility decline coincident with the onset of government family planning activities in areas of the country. Nevertheless, the impact of the government program cannot be considered above its share of total users. All in all, the question cannot be precisely answered without special surveys (like the Contraceptive Prevalence Survey of 1978) and better information on the private sector, as well as people's ability to substitute the private for the public sector if they need to.

In summary, this section of the chapter has gone into some detail to document the recent rapid decline in fertility and increase in use of family planning methods in Thailand relative to other Third World countries. This is important not only as background to the main study, but also because it documents an important change of world dimensions. The implications of the fertility decline in Thailand may be of far-
reaching consequences. Most importantly, fertility decline appears to be taking place independently of widespread socio-economic development, at least as commonly measured. Approximately 80% of the Thai population is rural and works in agriculture. In addition, fertility declines were initially quite impressive in the North and have recently been quite rapid in the Northeast. These two regions can be considered the poorest, as well as most rural, of Thailand. In lieu of socio-economic explanations, different cultural factors, such as the permissiveness and importance of the individual found in Thai Buddhism, as well as the relatively elevated status of women, have been ventured as part of the explanation (Knodel, 1978; World Bank, 1975). Also not to be discounted is the active and widespread national family planning program (Knodel, 1978), an important consideration in this study. Understanding the differences between users and non-users of family planning, as well as users of the private and public delivery systems for family planning, may provide some clues for reasons underlying the rapid fertility decline.

**Historical Involvement of the Thai Government in Family Planning**

Compared to other Third World countries with sustained high population growth, active participation of the Thai government in curtailing fertility came relatively late. It was only in 1970, when the government cautiously committed itself to an official policy to slow population growth. However, much activity preceded this official
pronouncement. The adverse consequences of Thailand's accelerated growth in the 1950s were brought to the attention of the government for the first time in a World Bank Mission report in 1959. This helped mobilize concerned Thai leaders and resulted in several Cabinet statements allowing, though not officially endorsing, family planning activities, as well as three high-level national population seminars in the 1960s.

Activity in family planning started on a small and modest scale within the government in 1965 (Sawannavej, 1976). Under the aegis of "family health research" and funded primarily through the United States Agency for International Development (USAID), The Population Council, and the United Nation's Children's Fund (UNICEF), family planning research and contraceptive distribution commenced through public channels (Thomlinson, 1971). In 1968 the Ministry of Public Health opened a family planning section and embarked upon an ambitious program which trained medical and paramedical personnel, distributed family planning supplies and materials, and made family planning available in 3,500 clinics of the national health system. When the National Family Planning Program was officially granted status in 1970, it was placed under the Family Health Division, thus allying it closely with Maternal and Child Health activities. The family planning program had its own modest staff provided for in the Ministry, "but family planning services were to be, and are, offered on an integrated basis as part of the Ministry's regular rural health services; there has been no separate field staff for either administration or services" (World Bank, 1975).
Since its initial years, the National Family Planning Program has steadily expanded its activities, especially through a flexible set of distribution strategies and a relaxation of requirements over who may be allowed to dispense certain birth control methods. Several population research units were established in both the national universities and the government, with research and pilot projects often preceding innovative program changes. The Thai government family planning program has operated as a working part of the larger public health program, though without many of the special exclusive family planning activities found in some countries. Few special family planning field staff have been hired; special facilities and clinics are not to be found; and, monetary incentives have not been paid to health personnel. In its basic form, the Thai National Family Planning Program uses a hospital/clinic strategy with clinic outreach programs. These strategies, however, have been supplemented by flexible and pragmatic policies of the Thai Ministry of Public Health.

**Delivery Strategies of the Thai National Family Planning Program**

This section of the chapter presents the different public sector family planning delivery strategies, starting with the hospital/clinic distribution network which is of foremost importance overall in Thailand. Then, the Thai adaptations of all the other major distribution strategies found around the world and mentioned in Chapter
II (except for the "camp strategy") are respectively discussed: the use of clinic extension workers, the involvement of paramedics, integrated programs, mobile units, and locally-based distribution schemes.

**Government Hospital/Clinic Network**

Since its inception, the Thai National Family Planning Program has been incorporated within the large infrastructure of the Ministry of Public Health, which provides family planning methods to the overwhelming majority of national program acceptors. People receive family planning services from government outlets in a manner similar to government-provided health care. The Ministry of Public Health operates under a "hospital/clinic approach" with a nationwide spatially-hierarchical system of health care and family planning delivery (see Figure 4.3).

The system can be seen as four-tiered in terms of the staffing, expertise, and available infrastructure. At the top of the hierarchy are the extensive medical facilities of the capital, Bangkok, well known as the most sophisticated facilities with the most reputable doctors. Rural people often travel long distances for medical treatment at Bangkok's huge hospitals. Likewise, people travelled long distances to Bangkok to obtain family planning, most notably IUDs and sterilizations, during the first years of government involvement.

The provincial network of the Ministry of Public Health operates on three distinct levels. At the top are the provincial hospitals of a few hundred beds which, although large and with modern equipment, are not
Primary health care stations (midwifery or second class health centers in the township)

Small (district) hospital

Large (provincial) hospital

Sophisticated services on the national level (Bangkok, Chiang Mai)

Figure 4.3. The spatial hierarchy of the public health/family planning system in Thailand.

Source: Adapted from Day and Leoprapai, 1977.
comparable to Bangkok hospitals in terms of size or reputation. Intermediate medical services are provided by the much smaller district (amphoe) hospitals, usually staffed with one or two doctors, a few nurses and midwives, as well as other support staff. At the most local level, there are the second class health centers, usually staffed with a male health worker and midwife. Unlike the other levels of the system, there is no provision for medical inpatient care at this level.

In reality, the provincial system is more complex than this simple three-tiered hierarchy, with at least three other less common types of health facilities. For example, there are many of the very small midwifery centers which are now being eliminated from the government health network, gradually being upgraded to second class health centers.

The Ministry of Public Health offers a wide selection of family planning methods hoping to increase contraceptive usage through the so-called "cafeteria approach." Oral contraceptive pills, long the most popular method, and condoms, a method little favored, are available at the local level, second class health centers. Also, if a trained nurse is staffing the center, IUDs can also be inserted. At the district and provincial hospitals, all approved methods are provided, namely, tubal ligation and vasectomy, IUD insertion, injectable contraceptives, oral pills and condoms. The overall recent usage patterns for different methods can be seen in Table 4.6.

The extent of geographic coverage of the Ministry of Public Health's delivery system in Thailand is surpassed only by the Ministry

<table>
<thead>
<tr>
<th>Method</th>
<th>1978</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>IUD</td>
<td>77,775</td>
<td>8.3</td>
</tr>
<tr>
<td>Pill</td>
<td>557,857</td>
<td>59.3</td>
</tr>
<tr>
<td>Female Sterilization</td>
<td>124,205</td>
<td>13.2</td>
</tr>
<tr>
<td>Vasectomy</td>
<td>44,256</td>
<td>4.7</td>
</tr>
<tr>
<td>Injectable DMPA</td>
<td>86,620</td>
<td>9.2</td>
</tr>
<tr>
<td>Other</td>
<td>50,006</td>
<td>5.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>940,719</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: National Family Planning Program comes from most all public sector providers, as well as some private sector providers. "New acceptors" are overestimated because acceptors who change methods are counted as new and the records for acceptors changing from one sector to another are often duplicated. Nevertheless, these statistics give an accurate picture of the relative distribution of use by method.

Source: Varakamin et al., 1980.
of Interior's administrative system and the national school system. At the time of the present study, 1977, it had 5,677 facilities under its control. There were 1394 midwifery centers, 3,928 second class health centers, 269 district hospitals, and 86 hospitals. The system has increased rapidly over the last 15 years and has received an even bigger boost under the Fourth National Economic and Social Development Plan (1977-1981) (Thailand, NESDB, 1977). Many of the newly built facilities, it should be noted, have been funded through population rather than public health monies.

The three levels of provincial health/family planning services correspond to the recognized hierarchy for administrative units of the Kingdom of Thailand: the provincial hospital hypothetically serves the whole province, the district hospitals serve the district and the primary health care stations cover the local level, the township (tambon). The Ministry of Public Health plans, ideally, to have an appropriate health/family planning facility in each administrative area, though the system is far from complete (see Figure 4.4).

"Typical to Thailand's historical and present stress on centralization, the system is most complete and most effective at the highest levels and quite lacking at the primary levels. Guided by the western model of large, expensively equipped hospitals, investment historically has centered on building large hospitals, almost all located in Bangkok and the provincial capitals. It has only been in the recent few years that government investment has been put into developing the health system at the more local levels. Today, less than half of
District Level: on average 9 districts/province

(no health facilities)

Township (Tambon) Level: on average 9 townships/district

Village Level: on average 9 villages/township

Figure 4.4. Extent of Health Facility Coverage in a Typical Province.

Source: Modified from Debhanom Muangman (1974, 15); based on Angthong Province in the Central Plains.
the eligible districts have a district hospital and, while local facilities are now quite numerous, large areas still remain unserved because of building concentration in better developed areas and the very limited service area of the facilities" (Day and Leoprapai, 1977, 26). People can recognize the health system hierarchy in respect to the more extensive services of the province and even more sophisticated and better services of Bangkok. However, very few recognize or use the district and township levels of government health service in a systematic or hierarchical way.

**Clinic Extension Workers**

Although government midwives attached to the hospital/clinic network routinely perform extension duties through family planning home visiting, special family planning clinic extension workers have seldom been used in Thailand. However, there have been instances of their use in pilot programs or in certain areas. One such project (discussed in Appendix B.1) compared the performances of extension workers under different monetary incentive schemes (Porapakham, et. al., 1973, 1975). In 1972 the National Family Planning Program began to recruit home visitors to motivate women to adopt family planning at the local community level. These field workers were either full-time paid field workers or village level volunteers, and by around 1975, there were 150 home visitors concentrated in a few districts in the Northeastern region (ESCAP, 1976, 85). However, the home visitor program never expanded beyond the pilot project stage (Bennett, 1981). Rather, the more
effective and widespread strategy has been to include home visits as part of the official government midwife's job. In addition, many of the government midwives have improved their accessibility to the people through program-supplied small motorcycles and bicycles.

Paramedic Involvement

Probably the most successful special strategy to facilitate the distribution of family planning in Thailand was through greater involvement of government paramedics. The involvement of the various personnel in the government family planning delivery network is affected by "a 'medical gradient' associated with the various methods of contraception, ranging from such doctor-provided services as female and male sterilizations, on down through medically supervised, but not necessarily medically-provided services (e.g., the insertion of IUDs or the approval of patients for orals), and on down to the delivery of such medically-unsupervised, totally client-regulated methods, as the use of condoms, foams and jellies" (World Bank, 1975, 29). To increase accessibility to more methods of family planning, the Ministry of Public Health has reviewed and revised clinical regulations after successful test programs, so as to push many specific services lower down in the medical gradient (World Bank, 1975, 31). The success of using nurses for IUD insertions and government midwives to prescribe the oral pill has been critical to the success of the National Family Planning Program. In 1970, when government midwives were allowed to distribute the pill, new acceptors per month increased greater than three times (Rosenfield,
1974a), with pills becoming available at over 4,000 instead of 350 government outlets. This strategy has greatly increased contraceptive accessibility in the more rural areas. Further expansion of this strategy has begun to be implemented in a program to train and then involve granny midwives, as well as other traditional private sector health care providers in motivating family planning acceptors.

Integrated Programs

Another diffusion strategy alternative is to integrate family planning services into larger specialized programs. Most common and successful in Thailand has been the inclusion of family planning as an integral part of maternal and child health programs in hospitals around the country. Thailand, as a member of the International Postpartum Program, had a very early successful experience with motivating women to accept family planning soon after giving birth in a hospital. The original program started in 1966 with four large Bangkok hospitals and later expanded to eleven other hospitals. The four special Maternal and Child Health hospitals involved were especially successful due to their "unusually fine follow-up services" (ESCAP, 1976, 91). As an indicator of the overall success of the program, 66,000 women participated in the International Postpartum Program in Thailand in 1972, 16.4% of the total National Family Planning Program acceptors. Although postabortion programs have never been implemented because of the illegality of abortion in Thailand, the research unit of the National Family Planning Program has suggested the possibility of trial use of nurses to perform
abortions (Narkavonnakit, 1979). If such a program became a reality, postabortion family planning programs should naturally follow.

Family planning has also often been a strong component of many integrated rural development programs in Thailand. The Lampang Project in Northern Thailand tested the efficacy of a combined nutrition, preventive medicine and family planning program to provide low-cost, integrated health care delivery for mothers and children up to six years old (DEIDS, 1975). The large Accelerated Rural Development (ARD) program experimented with the usefulness of ARD paramedics for motivating family planning. The community development program of the Ministry of the Interior in the early 1970s allowed young, university-educated volunteers to motivate people to use family planning and distribute contraceptives (World Bank, 1975, 38). These last two programs were more involved in motivation of family planning and can be seen as strategies involving integrated development programs along with clinic extension workers.

Mobile Unit Strategy

In both the Ministry of Public Health's health care and family planning programs there has been interest in mobile units, most commonly jeeps and motorcycles, to bring expertise and technology to more remote areas. The interest in "jeeping" in teams of Bangkok and provincial doctors, appears to be rooted in a whole series of mobile unit strategies developed intensively by USAID in the 1960s. In conjunction with USAID counterinsurgency programs (especially in Northeast Thailand)
and supported by an American faith in mobile technology, millions of dollars were spent on Mobile Development Units, Mobile Information Teams, and Mobile Medical Teams, and other similar mobile units. The Mobile Development Units and Mobile Information Teams have been criticized, especially for having little impact of a permanent nature (Caldwell, 1974). It appears that the Mobile Medical Teams have been of greater value, but their use for health care and family planning can be called into question in cost-benefit terms. Such an expensive and high technology-dependent strategy should be judiciously used. The World Bank Mission (1975, 49) recommended mobile services to concentrate on "sterilizations, IUDs, and injections—all 'high quality' acceptors," a more cost-effective strategy than the construction of health centers or hospitals, but obviously more expensive than the use of village volunteers. By the end of 1978, 64 vans for provincial mobile vasectomy programs were in place (Bennett, 1981). For medical and family planning use, Suphanburi Province had four jeeps at the provincial level and about one per district hospital. Caldwell (1974) estimated close to a maximum of 40 Mobile Medical Teams funded by USAID's Accelerated Rural Development program, mainly in politically sensitive provinces.

Locally-Based Distribution Strategies

The Community-Based Family Planning Services (CBFPS) project (detailed in Appendix B.1) is a private-sector program, but is non-profit and cooperates closely with the Ministry of Public Health. Its charismatic leader, and one of the world's best known family
planners, Mechai Viravaidya, has had his program written up in Time Magazine. The program relies on a large network of village volunteers—storekeepers, teachers, farmers, village headmen, and the like—to distribute and motivate villagers to use condoms and oral pills. The program started in 1974 with International Planned Parenthood support and, by 1975, had expanded to 10% of all the districts in Thailand. The apparent success of this program is hard to assess, though this study's survey, as well as another evaluation project, failed to locate as many family planning users as the program claimed. CBFPS accounts for about 10% of all the national program pill acceptors, while the Nationwide Contraceptive Prevalence Survey found that 3.2% of women on the pill were supplied by it (Porapakkham, et al., 1979). However, at least part of this discrepancy could come from respondents not knowing their family planning suppliers were part of the CBFPS network. Lower continuation rates for CBFPS acceptors could also account for differences between the acceptance and prevalence figures (Bennett, 1981).

A smaller project in a single district in the Central Plains has also tested a volunteer distribution network supplied through the Ministry of Public Health (Muangman, 1974). Having demonstrated its success, the project was subsequently absorbed into the CBFPS network in 1978 (Bennett, 1981).

Other Strategies

Finally, it might be mentioned in passing that several "strategy facilitators" have also been used in Thailand. Although incentives for
family planning distributors and acceptors are not widespread, there has been some emphasis put on mass communications projects. Starting with a pilot mass communication project in 1971, other major public information activities have been expanded. "These include the use of radio, television, and the cinema, the development of nine mobile public information units to cover the rural areas throughout the country, the printing of newsletters, calendars, posters, leaflets and pamphlets, match and book covers, and the development of a research and planning unit in the communications field" (ESCAP, 1976, 88). It is hard to assess the impact of these programs, though it appears that they have not been too pervasive and, in Thailand, their effect has not been large.

Public Family Planning Delivery Outside the Ministry of Public Health

Outside the Ministry of Public Health's large family planning delivery network, there are several other public or non-profit institutions and agencies that are connected to health care and family planning work. They are basically three in kind: 1) hospitals not under the auspices of the Ministry of Public Health, 2) primary health care programs under the jurisdiction of the Ministry of the Interior, and 3) private non-profit family planning organizations.
Non-Ministry of Public Health Hospitals

There are many large and important hospitals outside the Ministry of Public Health's nationwide network of 84 hospitals. Very important for medical research and family planning delivery are the five large university hospitals (with two more under construction) administered by the Bureau of State Universities in the Office of the Prime Minister. Besides supplying regular family planning services, these hospitals have been the moving force in Thailand behind the postpartum program, much of the major clinical research in family planning, special programs like the vasectomy program of Siriraj Hospital, as well as other diversified family planning work. Also important are the 18 Army, Navy and Air Force hospitals spread throughout the country and run by the integrated Ministry of Defense. Finally, there are other government ministries with their own hospitals; for example, Agriculture, Communications, and National Development (World Bank, 1975), as well as hospitals for the national railroads, the Port Authority of Thailand, and other state enterprises.

Programs of the Ministry of the Interior

The Ministry of the Interior, in charge of the local administration network within the highly centralized Thai government, has input into family planning through both its administrative and health care work. Through its control of the tambon (or traditional) doctor, one of which is located in most all townships, the tertiary administrative unit, the Ministry of the Interior possesses a national network of health care
practitioners of great potential. Although not officially allowed to provide any family planning methods, some do, and thought has been given to making them a part of the National Family Planning Program distribution network. More important to family planning delivery is the Ministry of the Interior's Border Patrol Police health and family planning program. The Border Patrol Police provide family planning throughout the remote border areas where they are stationed, often to the ethnic minorities, and thus perform an important service in increasing the accessibility of the family planning distribution network in Thailand. Lastly, of some importance are a number of special projects of the Ministry of the Interior which have incorporated family planning projects into integrated development programs. Both family planning motivation and distribution have been parts of special programs such as the Accelerated Rural Development program and the Community Development workers mentioned under integrated program strategies in the last section of this chapter.

Private Non-Profit Programs

A last non-Ministry of Public Health family planning organization is the Planned Parenthood Association of Thailand (PPAT), an affiliate of the International Planned Parenthood Federation. PPAT is a private organization, but as it cooperates closely with the Ministry of Public Health and is non-profit, it is best discussed outside the private sector. The PPAT started in 1970, has taken on special, more innovative family planning projects and several training sessions. Examples of its
work include the use of traveling entertainers and story tellers ("Moh Lam") in the Northeast to spread the word about the government National Family Planning Program as they perform (Worrall, 1977).

Private Sector Family Planning Activities in Thailand

There is much less known about the private sector than the public sector, though continuing research has increased government awareness of this informal system working almost completely outside the Ministry of Public Health. The Thai medical/health care delivery system has been quite appropriately described as "variegated" (Riley and Sermsri, 1974), with a large variety of choices of health care providers to choose from in both the public and private sectors. This same multiplicity of choice is true for family planning. A number of public sector providers outside the Ministry of Public Health's jurisdiction have already been mentioned, and in this section we will discuss the diverse options available through the private sector. Sources of family planning in the private sector fall into three general groups: 1) drugstores, 2) private "Western-medicine" doctors with their clinics and hospitals, and 3) local practitioners, a vast assortment of practitioners at various levels of competence. Examples of these "local doctors" are the traditional doctors, injection doctors, granny midwives and others.
Drugstores

Drugstores number about 12,000 throughout Thailand and comprise a widespread network of drug and medical service centers. They provide health care advice, as well as drugs and contraceptives. Oral pills are the biggest sellers, with condoms secondary in importance and other methods of birth control occasionally available. Estimates of private commercial sector distribution of oral pills numbers 3-4 million cycles a year, while total condom and spermicide distribution is about 120,000 gross and 120,000 tubes, respectively (ESCAP, 1976). Most of these are distributed through the nation's drugstores, indicating an important overall contribution of these outlets to family planning distribution efforts. The National Contraceptive Prevalence Survey reported drugstores to be the most frequent source of condoms, as well as selling oral pills to about 21% of all pill users (Westinghouse, et al., 1978) at a cost of approximately U.S. $.45 to $1.00 (World Bank, 1975, 35) per cycle.

Drugstores, though widespread and the only near universally-used health care provider (Day and Leoprapai, 1977), are not equally distributed throughout the country. The number of drugstores, as well as the variety of drugs, varies inversely with city size, with the best drugstores found in Bangkok, the next best, provincial capitals, and down the line to district seats ("tua amphoe") and smaller market centers. The disproportionate dominance of Bangkok (which has about 10% of the population) is evident from Table 4.7. Of the three classes of drugstores (based on the potency of drugs they may sell), only first
Table 4.7. First and Second Class Drugstores in Thailand, 1974.

<table>
<thead>
<tr>
<th></th>
<th>First Class</th>
<th>Second Class</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangkok</td>
<td>1,070</td>
<td>801</td>
<td>1,871</td>
</tr>
<tr>
<td>Rest of Country</td>
<td>709</td>
<td>3,858</td>
<td>4,567</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,779</td>
<td>4,659</td>
<td>6,438</td>
</tr>
<tr>
<td>Bangkok as Percent of Total</td>
<td>60.2%</td>
<td>17.2%</td>
<td>29.1%</td>
</tr>
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</table>
class drugstores are officially allowed to dispense oral pills but, in practice, second class drugstores do a thriving business as well. Both are similar to a Western drugstore, except that in Thailand most any drug can be gotten over the counter without a prescription. Third class drugstores are less important, although greater in number (as recorded in official statistics) than the larger drugstores and for family planning, are limited to selling only condoms.

Private "Western-Type" Doctors

A second important private source of family planning are "Western-type" doctors and nurses. There are a few private non-government hospitals, as well as medical doctors who practice privately all day, but usually the Western-trained medical personnel work at a government medical facility during the day and then have private clinic practices either in early morning or early evening. Most dispense drugs from their clinics and some have even opened up their own drugstores. This is not only the pattern for fully-trained M.D.s, but also government nurses and other medical personnel down the "gradient." At times government service is neglected with government workers pursuing their more lucrative private practices. This appears to be a problem of serious dimensions.

There are an estimated 5,000 private doctors' clinics throughout the country (Thailand, NFPP, 1977, 24; World Bank, 1975, 39). Although it has been reported that the private clinics' role in family planning "appears negligible" (World Bank, 1975, 40; Thailand, NFPP, 1977, 25),
the present survey documented that almost 14% of family planning "ever-users" received service from private clinics, mostly for sterilizations, but also contraceptive pills and injections. The National Contraceptive Prevalence Survey in 1978 did not break down its data on sources of family planning methods for private clinics, but we might reasonably assume the 9.7% of all current users supplied by "other" to be getting service from either private clinics or local doctors.

Although private hospitals in Thailand are few, they also contribute to the family planning network around the country. By far the most important is the McCormick Hospital in the northern province of Chiangmai. The McCormick Family Planning Clinic has received worldwide renown for its work with injectable contraceptives. From its inception in 1963 to 1975, a total of 86,252 new acceptors have been recruited and annual totals have been increasing almost every year (Pardthaisong, 1977).

Local Practitioners

There are many different types of local practitioners (e.g., see Yoddumnern, 1974; Riley and Sermsri, 1974). Many are found throughout the rural areas, though others are much less prevalent. They vary greatly in their degrees of expertise and some may specialize in only one area, for example poisonous snake bites. Their role in birth control is more important than usually suggested. They most frequently give abortions (an illegal but tolerated practice in Thailand) and vasectomies, though a few sometimes dispense contraceptive injections and pills.
Three groups of local practitioners are most prevalent: traditional doctors, injection doctors, and granny midwives ("maw tam yee," or traditional birth attendants). The traditional doctor relies on traditional herbs and cures. Several different types of practitioners, such as herbalists, Buddhist monk doctors, and spirit doctors, can be included under this category. Injection doctors, a second type of indigenous medical practitioner, work either out of a small shop or make home visits plying their knowledge of western medicine. They are, in general, younger than traditional doctors and are either self-taught or have received training often as a military medic. The granny midwife accounts for an estimated 80% of all birth deliveries (mostly in the rural areas) and, in the Suphanburi survey, was second only to the drugstore in health care providers "ever-used."

The Ministry of Public Health has recognized these local doctors as a vast network of practitioners who can be used to motivate and distribute family planning methods. They have recently initiated programs to train and equip both granny midwives and traditional doctors. A program has been designed to train a total of 7,500 granny midwives over 5 years in midwifery techniques, as well as family planning motivation, allowing them to resupply old acceptors (Thailand, NFPP, 1977, 33). A second program will train the traditional tambon doctor, over 5,000 of whom work under the jurisdiction of the Ministry of the Interior, to motivate and distribute contraceptive pills and condoms (Thailand, NFPP, 1977, 34). These two programs can be viewed as a combination of two family planning diffusion strategies: the involvement of paramedics and locally-based distribution.
Two other important methods of birth control received through the private (non-M.D.) local practitioners are abortion and male sterilization. Abortions in Thailand are now estimated to number approximately one million a year (Narkavonnakit and Bennett, 1981), a figure much higher than previously thought. Survey information for one northeastern province showed 90% of the abortions to be first trimester, usually massage (60%) or uterine injection (23%) abortions (Narkavonnakit and Bennett, 1981). Rural abortionists are predominantly female (92%) and well-known in their communities. Several were granny midwives, and, although most did not rely on abortions as the principle source of their household's income, their average annual caseload was 356 abortions (Narkavonnakit, 1979). Vasectomies, another birth control method provided by this informal sector, is reportedly frequently done by male injection doctors. While male sterilization is common, the more difficult female sterilization operation is not.

The Survey Area: Suphanburi Province and Its Family Planning Distribution Network

Introduction

Having reviewed the variety of public and private family planning providers in Thailand, this final section of the chapter now turns to describing the survey province and its public health/family planning activities. Following an overview of the province, the districts of the province are compared on a national level to show how they relate to the country-wide situation.
Suphanburi: A General Overview

Suphanburi Province (population: 700,000) was chosen as the survey site after examining geographical, administrative, and health statistics for each of the 71 provinces of Thailand and then eliminating the provinces which did not fit certain criteria. The statistics for Suphanburi indicated it was appropriate for the study purposes and could be, in many ways, considered representative of Thailand. It has a well-developed, yet not complete, health network with 62 health stations, five district hospitals, and a large provincial hospital. This was an important consideration because the study design required a whole hierarchical provincial network to study without an excessively large area to survey. To complement its health hierarchy, the province is within travel distance (approximately 150 kilometers) of Bangkok, which allows another choice for residents, the most sophisticated health facilities in the country. Suphanburi is reasonably prosperous, though not rich: the economy almost entirely agricultural with approximately its eastern half in the paddy lands of the Central Plains while its western half slopes up to the uplands and mountains and is devoted to dry cash crops, primarily sugar cane. Paddy rice and cash field crops, especially sugar cane, casava, and corn, dominate rural Thailand where 85% of the population live.

Thailand itself has five distinct regions (Donner, 1978): the lush South with its plantations and tin, the poor northeastern plateau, the Bangkok Metropolitan Area, and the somewhat mountainous North which
gradually rises out of the fertile Central Plains. In approximately the middle-west of the Central Plains lies Suphanburi Province (Figure 4.5). Typical of the pattern of diffuse urbanization (Hackenberg, 1980) found in the upcountry provinces, Suphanburi has a small but important functioning urban network. The only city of note is the capital city of Suphanburi (in Thailand all provincial capitals have the same name as the province) with a population of about 20,000. The city functions mainly as market, service, and administrative center for the predominantly (95.5%) rural province (Thailand, NSO, 1975). The highly centralized administrative structure of Thailand causes upcountry administrative centers to have a large number of government civil servants, bureaucratic offices, as well as schools and other institutions. In each of the nine districts there are district seats with about 2,000 to 10,000 people, which mirror the market and administrative functions of the provincial capital on a smaller scale. Farther down the hierarchy are numerous, somewhat smaller semi-urban market centers of less than 1,000 to about 4,000 population. These places, sometimes classified as "sanitary districts," have many urban characteristics and are important links for the marketing and distribution of goods. Below these semi-urban market centers are smaller, yet viable, market centers, some with only a few shops. Smaller and more inaccessible villages still sometimes have periodic markets, while other times peddlers will ply their wares by boat on the river and canal systems. The two southern-most districts of the province are typical of the flood plains of Central Thailand. They are
Figure 4.5. Map of Thailand by Province Showing the Survey Province of Suphanburi and the Four Major Regions.
inundated with about four feet of water around four months of the year, making boats the only means of travel. The other districts have year-round road access with some good paved roads. Nevertheless, the vast majority are dirt roads, with mud and holes hindering travel when it rains and deep dust when drought sets in. Depending on how remote a village is, a trip to the market by "truck-bus" transport can be a time-consuming and bumpy ride.

The Districts of Suphanburi: A National Comparison by Quintile Rankings

Detailed administrative, health and family planning statistics for Suphanburi (Table 4.8) show the individual districts to be reasonably representative of the social and health care situation in Thailand today. These statistics can be compared to all districts nationally by examining their quintile ranking. Several districts in Suphanburi are approximately average in population size and density, with one, the capital ("muang") district, somewhat larger in population and density and another, Special District Dan Chang, with a small population and very low density in the remote, predominantly mountainous area. The areal size of the districts in Suphanburi is somewhat smaller than the national average of 933 square kilometers, with the exception again of Dan Chang. The smaller size of eastern districts in Suphanburi reflects the national pattern that administrative units tend to be progressively larger with distance from Bangkok and the Chao Phraya River Valley. With regard to socio-economic characteristics, statistics on residential
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<th>District</th>
<th>Population</th>
<th>Area (km²)</th>
<th>Population Density (Pop./km²)</th>
<th>Rural Density (Pop./km²)</th>
<th>Total Population</th>
<th>Average Size of Service Sites</th>
<th>Potential Facility Sites</th>
<th>Active Facility Sites</th>
<th>Service Sites</th>
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use of electricity portray a fairly accurate picture of the districts in Suphanburi being above the national average. The province, however, pales in significance to the Bangkok Metropolitan Area, which averages around 170 kilowatt hours of electricity used annually per person.

Health care statistics show the districts of Suphanburi to be somewhat average, overall, though with enough variability that fairly extreme cases are represented. A quintile breakdown for all districts in Thailand for the "population per medical doctors and nurses," indicates a large range of conditions for districts in Suphanburi. The capital district, in a pattern typical to all provinces, has the most favorable ratio. The 52 medical doctors and nurses there, 80% of the provincial total, work primarily at the provincial hospital. The remainder works out in the more rural districts. With regard to the coverage of the provincial public health system, the "population per health service site" is relatively large, while the "average area per health service site" has a relatively small average service area compared to other districts around the country. In general, the health service centers in Suphanburi cater to a relatively large and somewhat closer population than what is found nationally. Because of the higher population density and smaller administrative units in the rice growing Central Plains, the health system remains only about 70% complete for the province as a whole, with the people still having reasonable accessibility compared to the situation countrywide.

The organization of public health facilities in Suphanburi Province reflects the three-tiered hierarchical provincial administrative system
found throughout the country. The extent of the system, as of March, 1977, the time of this study's survey can be seen in Figure 4.6. At the local level, there are 62 health stations, 60 of which are second class health centers and only two of which are midwifery centers. This leaves 27 townships without an active health center. At the intermediate level, there are five district hospitals, the one in Doembang-Nangbuat quite new and without a doctor, and therefore still of "medical and health center" status. The remaining three eligible districts (the provincial hospital serves the capital district) are scheduled for district hospitals in the future. At the top level, the provincial hospital in Suphanburi (with approximately 250 beds) is supplemented by the provincial hospital at Singburi in the north and Kamphaengsaen Air Force Base Hospital to the south. Both of these places seem to have a better reputation than the provincial hospital in Suphanburi and are a shorter travel distance for a part of the population.

The little available national-level data on private health care providers indicates all the districts in Suphanburi being relatively well off, in the third to fifth quintiles nationally in population served per major drugstore. Statistics on private doctors' clinics in Suphanburi, though revealed to be of questionable accuracy when later checked in the field survey, show a pattern typical of the country. There are few officially registered clinics overall, of which the overwhelming majority is in the capital district. The full extent of the private clinic system is not ascertainable from government statistics but can be assumed to be far more extensive than recorded,
Figure 4.6. Map of the Public Health/Family Planning System in Suphanburi, 1977.
especially if the clinics of "doctors" with lesser training are also included.

Two indices point out the actual National Family Planning Program performance for each of the districts: the percentage of eligible women who obtain pills from government outlets, and the percentage of eligible women who are new acceptors. The former statistic is based on the total number of pill cycles given out per year per eligible woman in each district and gives a good indication of continuing users in that pills are the most popular of the government-provided methods of birth control (see Table 4.6). Both these indices, because of problems of definition, ought not be compared to outside data. Nevertheless, there is a wide range of performance, with several districts far below and several above the national average. The poor performance of the capital district is probably partly due to heavy competition with the private sector, notably drugstores. The superior performance of Don Chedi District appears in good part a credit to the concerned and well-liked doctor at the small district hospital there.

The contribution of public sector outlets in the distribution of family planning is at most 64.6% of the total, as indicated by the random sample survey of Suphanburi in 1977. This is slightly less than the figures of 77% for the whole country as determined by the National Contraceptive Prevalence Survey for 1978 (Porapakkham, et al., 1979). At least four reasons for the greater importance of the private sector in Suphanburi can be ventured. First, there is reason to believe that the greater prevalence of drugstores in the Central Region leads to a
larger contribution of the private sector. This is borne out in the National Contraceptive Prevalence Survey statistics, which show the drugstores having a larger share of the pill market in the Central Region, as compared to the North, Northeast, and South. Second, there appears to be a greater number of vasectomies performed by private doctors and paramedics in the Central Region. Third, the National Contraceptive Prevalence Survey may have used a slightly more liberal definition of "government outlets." Fourth, the Contraceptive Prevalence Survey was done almost two years after the Suphanburi Survey, and, given the increasing involvement of the National Family Planning Program, some overall gains could have been made during this time.

The statistics presented thus far should give a fairly accurate overall picture of Thailand and the survey province of Suphanburi, both in terms of the socio-economic setting and family planning activities. More detailed statistics on the use of different family planning providers for specific methods have been included in the appendix in Tables A.4.1 and A.4.2 for the interested reader.

Chapter Summary

Chapter IV provided an overview of Thailand and the survey province of Suphanburi. This predominantly rural province of the Central Plains was justified for in-depth study on the basis of its representativeness. Then the important family planning providers and their distribution strategies were discussed in some depth, both in
relation to Thailand and, more specifically, Suphanburi Province. The discussion of public sector family planning distribution strategies used the same seven-fold classification scheme presented in a detailed world context in Chapter II and Appendix B.1. All but one of the seven strategies were found in Thailand, though the standard government clinic/hospital approach and use of paramedics, both government and non-government, appear most important. Also of note are the hospital postpartum approach, locally-based distribution schemes, and the use of home visits by government health personnel as a clinic extension strategy. Most important in the private sector is the drugstore, especially as a source of contraceptive pills, and of lesser importance are private doctors and paramedics who often provide vasectomies. A final method of birth control, abortion, is performed overwhelmingly by the private practitioners. However, information on abortions was not gathered in the survey because they are, for the most part, illegal in Thailand and, therefore, are not included in the National Family Planning Program. Overall, in Thailand and Suphanburi there is a wide variety of sources of family planning, though official government providers have played the dominant role.

The information of this chapter on population and family planning in Thailand and the survey site, Suphanburi, provides the background on which to interpret the principal analysis. The next chapter first describes the data collection procedure, and second, provides the rationale for the variables which empirically test the Family Planning Transaction Model. Following, Chapter VI presents the analysis.
CHAPTER V

THE ANALYSIS: THE DATA BASE FOR ANALYZING FAMILY PLANNING USE AND CHOICE OF PROVIDER

While the preceding chapter described specifics of the country and province under study, the present chapter addresses the data base and the variables to be employed in the analysis. To set the context for the data, the chapter begins by briefly outlining the operational model emanating from the Family Planning Transaction Model and the hypotheses to be tested in Chapter VI. Second, Chapter V recounts the procedures for the 1977 Suphanburi survey, the source of data for this study. Third, the dependent variables for the analysis are discussed, and fourth, the choice of specific independent variables is justified on the basis of their relevance to the Family Planning Transaction Model and supporting literature. The detailed discussion of the approximately 50 variables is organized within the framework of the model.
The Operational Model and Hypotheses to Test

The principal research question in this analysis is to distinguish between people who use the public and private sector for family planning. Preliminary to this question, the secondary research question examines what type of people use or do not use family planning in the first place. These two questions determine the dependent variables of the operational model.

Independent variables were chosen to represent important attributes of either the potential user, provider, gap, or social setting, the four important components of the family planning transaction. In general, all the components of the family planning transaction were hypothesized to be important in the family planning transaction. Nevertheless, certain components of this process were suggested to be relatively more important. Characteristics of both the individual and social setting ought to be more important in predicting the use of family planning. On the other hand, it is hypothesized that the choice of a provider is more related to the gap between the potential user and the provider. Differences in socio-demographic characteristics, as well as the effects of distance to different providers, should play important roles. The former was suggested by comments of the rural people in Suphanburi, the latter by the author's work with inherently geographic variables.
The Data

The data for the analysis were collected from late February to late April, 1977. During that time three surveys were undertaken: 1) the main survey, a random sample of 2,110 residents of Suphanburi Province, 2) a survey of 108 government public health/family planning workers, with at least one from each of the 69 facilities in the province, and 3) a survey of 271 outpatients using the provincial and district hospitals. These surveys were named and will subsequently be referred to as the People's Survey, the Health Worker Survey, and the Outpatient Survey (see Table 5.1). Also, two other sets of data were collected during the project. Twenty-eight social and health variables for each of the 643 districts in Thailand were assembled prior to the field work. Some of these statistics aided in the selection of the sample province, Suphanburi, as discussed in Chapter IV. Second, immediately following the interview with the health worker, statistics were collected for each health facility on the number and home locations of outpatients for the last six months and family planning acceptors for the previous month. These data provided a dependent variable for family planning use, which was eventually passed by in the present analysis in favor of the individual level family planning use statistics of the survey respondents themselves. In the principal analysis of this study, only data from the People's Survey and Health Worker Survey were drawn upon.
Table 5.1. Data Sets from the Project.

<table>
<thead>
<tr>
<th>Data Set</th>
<th>Number of Cases</th>
<th>No. of Data Cards</th>
<th>Geographical Coverage</th>
<th>Source of Data</th>
<th>Type of Sample</th>
<th>Approx. No. of Variables</th>
<th>Date of Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphoe (district)</td>
<td>643</td>
<td>2</td>
<td>National</td>
<td>National government, mostly from Ministry of Public Health</td>
<td>Complete for all amphoe existing in October, 1975</td>
<td>22</td>
<td>1977</td>
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<tr>
<td>Level Statistics</td>
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<tr>
<td>People's Survey</td>
<td>2110</td>
<td>5</td>
<td>Suphanburi</td>
<td>Households in (197) villages and (2) municipal areas</td>
<td>Two stage systematic random sample for villages and households</td>
<td>115</td>
<td>February-April, 1977</td>
</tr>
<tr>
<td>Health Worker Survey</td>
<td>108</td>
<td>4</td>
<td>Suphanburi</td>
<td>Government health worker</td>
<td>At least one survey each active health facility, more for hospitals</td>
<td>62</td>
<td>February-April, 1977</td>
</tr>
<tr>
<td>Health Facility Service</td>
<td>619</td>
<td>1</td>
<td>Suphanburi</td>
<td>Every active government health facility</td>
<td>Complete for all active places as of April, 1977</td>
<td>18 (for health stations)</td>
<td>February-April, 1977</td>
</tr>
<tr>
<td>Service Statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient Survey</td>
<td>271</td>
<td>2</td>
<td>Suphanburi</td>
<td>Outpatients using four amphoe hospitals and the changwat hospital</td>
<td>For amphoe hospital: all patients in a two-day period; for changwat hospital: three days</td>
<td>28</td>
<td>April, 1977</td>
</tr>
</tbody>
</table>
Survey Preparation

The formulation of the research questions and needed survey information was preceded by careful consideration of the pertinent literature, and several informal interviews with knowledgeable academics, public health experts, and rural peoples. The questionnaires were then drawn up and cooperatively translated with members of the research staff at the Institute of Population and Social Research (IPSR). The People's Survey was translated by Benja Yoddumnern, a medical anthropologist, who took special care to avoid linguistic misinterpretations of the questions while setting the questions in a context familiar to the rural Thai people. After reconsideration by the IPSR staff on the wording and format of the questionnaires, both the People's Survey and Health Worker Survey were pre-tested in Ayuthaya, a province contiguous and similar to the survey site of Suphanburi. Following further alterations the final survey was taken to the field. The People's Survey collected about 115 pieces of information in all.

The sampling procedure for the villagers' survey was devised by Dr. Boonserm Weesakul, who also did the statistical design for the 1970 Thai census. A two-stage random sample started with 200 village areas or "muban" (approximately one out of every three) in the province being chosen by systematic random selection in proportion to the number of households in each village. In each village ten households were selected by an approximate random walk method, assuring a good spread of the sample within the boundary of a village area. In
the two municipal areas of Suphanburi, ten households within census enumeration blocks were interviewed, the number of blocks being chosen so as to keep the sample proportionate to number of households and consistent with the rural (village) sample.

Besides deciding the sample design and the content of the questionnaires, other preparations were made before going into the field. A set of 1:50,000 scale precise topographic maps (15 altogether) was obtained from the Royal Thai Survey to supplement a set of maps from the mapping division of the National Statistical Office (NSO), which were more up-to-date but less detailed. The accuracy of the maps and locations was inherently very important to this study in that distances from villages to health facilities had to be accurately measured. Also, further detailed statistics were collected for each district in Suphanburi, as well as health facility and personnel listings and statistics both from the Ministry of Public Health, Division of Rural Health and the Provincial Health Office of Suphanburi.

Field Operations

After a week-long training for the interviewers, the survey was taken into the field from late February to late April 1977. Three survey teams, each consisting of a jeep, driver, three interviewers, and a supervisor, were responsible for covering two villages or twenty surveys a day. The interview took 15-20 minutes with about the same amount of time on the average spent for transportation around the
village. This schedule made for a good day's work, but did not fatigue
the interviewers or pressure them into a pace that mistakes would more
likely be made. In addition to the survey team, a special full-time
research assistant conducted the Health Worker Survey at the health
facilities. As project supervisor, the author was in the field for
almost the whole duration of the survey to coordinate and ensure
consistency in the survey, as well as observe and take notes on the
surveys to better interpret the actual responses at the time of
analysis. During the survey, valuable insights were obtained from local
people and family planning providers, both through the formal interviews
and the sometimes even more useful informal discussions. This close
association with the field work was an important learning experience and
stimulated deeper insights and new approaches to the research problem.
Methodologically, this experience is somewhat akin to a recent approach
to demography, used by anthropologists, which stresses both close
experience with a community, as well as formal data on it. (For a good
example of this type of study in the Central Plains of Thailand, see
Lauro, 1979.)

The quality of the interviewing seemed quite high. The field
personnel were well above the average surveyors in Thailand. Most of
the female interviewers were university graduates, the vast majority
from the prestigious schools of Chulalongkorn, Thamasat and Mahidol.
The supervisors were also highly qualified, all coming from the
permanent staff of the institute, and trained in both population and
survey techniques from universities abroad. All but one of the
supervisors held a degree of M.A. or Ph.D., and most had former field work experience.

**Data Processing**

Upon completion of the field work, the surveys were taken to the IPSR where they were coded for computer processing, rechecked and then keypunched. The author closely supervised the sometimes uncertain classification of open-ended questions, as well as devised the coding scheme and wrote up the English half of the bilingual codebooks for each survey, the People's Survey codebook being more than two hundred pages in length. After four months of coding and keypunching, the raw data were then computer-edited to correct clerical errors and inconsistencies.

In the fall of 1977, the data were analyzed and the results of the main survey written up in a monograph (Day and Leoprapai, 1977), which served as the final report on the project on "The Effects of Location on Family Planning/Health Facility Use in Thailand." The report concentrated on the implications of the primary data and also took a detailed look at the factors associated with the "ever-use" of both private and public health care providers in the survey province. Some of the results of this analysis will be mentioned in this chapter to justify the choice of important variables to be tested for their relationship to use of different family planning providers. The 100-page monograph made many quantitative and qualitative assessments, along with several policy recommendations for improvement of the government
public health system. However, more detailed analyses of the data were precluded by the time constraints of the project, the whole of which was completed in two years.

**Post-Project Data Manipulation**

The purpose of this dissertation was to more fully exploit this large and purposefully-collected set of data, which was designed to uncover factors behind government provider use by transforming variables into more precise form and subjecting the data to multivariate analysis. A large number of variables was transformed on the Ohio State University Amdahl computer, taking advantage of the ease of statistical manipulation through the Statistical Analysis Systems (SAS) programs. Multivariate analyses were done with SAS, as well as the Biomedical Programs (BMDP) and the Statistical Package for the Social Sciences (SPSS), all of which have their own special advantages. SAS has excellent programs, as well as ease of data manipulation. BMDP has several very powerful analytical programs and SPSS has advantages of being able to use data with missing values in most programs (not an option in SAS programs), and probably has the best, at least most extensive, discriminant analysis program, the major analytical tool of this dissertation.
The Dependent Variables

Two distinct questions define the dependent variables in the empirical analysis. The preliminary analysis searches to distinguish between users and non-users of family planning. The second, and principal analysis discriminates between users of the public and private sector.

Two dummy dependent variables were chosen for the discriminant analysis between users and non-users of family planning. The first was whether or not a couple was currently using some method of family planning. The second dependent variable was broader in scope, differentiating whether a couple ever-used family planning or not. Obviously, those classified as "current users" also were part of the population of "ever-users."

The dependent variables for the discriminant analyses among different types of providers were drawn from those households which had ever used a family planning provider. Their most recently used provider was categorized as either "government," "private/western-type," "drugstores," or "local/traditional." These groupings allowed analyses discriminating among all four categories or between the government providers and non-governmental providers (the other three categories).

While preparing the data for analysis, not only did proper groupings for different dependent variables have to be considered, but also the proper population for the analysis had to be specified. This is because the random sample survey investigated not only family
planning behavior, but also medical/health care behavior as well. Certain households in the sample were not appropriate, for they had no reason to want to use family planning or to choose a family planning provider. These households included those headed by a single, never-married person, those who wanted more children, those with an infecund couple and those for whom family planning was not available when they were fecund. These households made up 625 of the 2,110 households surveyed and left us with about 70% of the sample to work with for the discriminant analysis between users and non-users of family planning. For the analysis of choice of provider, non-users of family planning were eliminated and the sample size decreased to about 650 cases, 30% of the original sample survey. Nevertheless, the sample size was adequate for the four different groups of providers with the possible exception of the local traditional providers of family planning.

The Independent Variables: Introduction

Having defined the dependent variables, those to be classified or "explained" in the discriminant analysis, the chapter continues with a description of the independent variables. This, the longest portion of the chapter, is organized within the framework of the Family Planning Transaction Model and follows sequentially through the major components, their descriptors and the individual variables as outlined in Table 5.2. The variables of the empirical analysis are discussed under four
Table 5.2. Independent Variables Used in the Analysis.

<table>
<thead>
<tr>
<th>General Type of Variable</th>
<th>Shortened Name</th>
<th>Definition</th>
<th>Source**</th>
<th>Range of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USER:</strong> Demographic:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Marital Status</td>
<td></td>
<td>Separated, divorced, widowed (0); presently married (1)</td>
<td>A.1, A.4</td>
<td>0/1</td>
</tr>
<tr>
<td>Age of Wife</td>
<td></td>
<td>Age of ever-married women</td>
<td>A.1, A.3, A.13</td>
<td>17-80</td>
</tr>
<tr>
<td>Years Married</td>
<td></td>
<td>Number of years married</td>
<td>A.5</td>
<td>1-54</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td></td>
<td>Number of children-ever-born</td>
<td>A.15</td>
<td>0-18</td>
</tr>
<tr>
<td>Child Mortality</td>
<td></td>
<td>Children-ever-born subtracted from living children</td>
<td>A.15, A.17</td>
<td>0-8</td>
</tr>
<tr>
<td>Occupation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occ: Farmer</td>
<td></td>
<td>Occupation of husband: farming (1)</td>
<td>A.10, A.14</td>
<td>0/1</td>
</tr>
<tr>
<td>Occ: Government</td>
<td></td>
<td>Occupation of husband or wife: government work (1)</td>
<td>A.10, A.11, A.14</td>
<td>0/1</td>
</tr>
<tr>
<td>Occ: Informal Sector</td>
<td></td>
<td>First or second occupation of husband or wife: informal sector (1)</td>
<td>A.10, A.11, A.14</td>
<td>0/1</td>
</tr>
<tr>
<td>Socio-Economic:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>Level of formal education of head of household</td>
<td>A.12</td>
<td>0-8</td>
</tr>
<tr>
<td>No Electricity in Home</td>
<td></td>
<td>Electricity in the home (1); None (2)</td>
<td>A.27</td>
<td>1/2</td>
</tr>
<tr>
<td>Read Newspaper</td>
<td></td>
<td>Times per month read newspaper</td>
<td>A.20, A.20.1</td>
<td>0-30</td>
</tr>
<tr>
<td>Relatives in Home</td>
<td></td>
<td>Number of relatives living in the home</td>
<td>A.19.2</td>
<td>0-12</td>
</tr>
<tr>
<td>Native to Local Area</td>
<td></td>
<td>% of life lived in local village</td>
<td>A.7, A.3</td>
<td>0-100%</td>
</tr>
<tr>
<td>Double Crop Rice</td>
<td></td>
<td>No farming, no rice farming (0); rice farming (1); double crop rice (2)</td>
<td>A.25</td>
<td>0-2</td>
</tr>
<tr>
<td>Relative Land Holdings</td>
<td></td>
<td>Land holdings divided by average village land holdings; no land = 0</td>
<td>A.23, GEOID</td>
<td>0-3</td>
</tr>
<tr>
<td>Land Owned</td>
<td></td>
<td># of rai the family owns (1 rai = .4 acre)</td>
<td>A.23</td>
<td>0-500</td>
</tr>
<tr>
<td>General Type of Variable</td>
<td>Shortened Name</td>
<td>Definition</td>
<td>Source</td>
<td>Range of Values</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>------------</td>
<td>--------</td>
<td>----------------</td>
</tr>
<tr>
<td>Mobility:</td>
<td>Trips to Market</td>
<td>Trips to major market center in a month*</td>
<td>D.10</td>
<td>0-9</td>
</tr>
<tr>
<td></td>
<td>Trips to Bangkok</td>
<td>Trips to Bangkok in last 5 years by respondent or spouse</td>
<td>D.34</td>
<td>0-96</td>
</tr>
<tr>
<td>Health Attitudes:</td>
<td>Entry into Health System</td>
<td># of different types of government health facilities ever used</td>
<td>B.1.9-B.1.12, E.15</td>
<td>0-6</td>
</tr>
<tr>
<td></td>
<td>Satisfaction with Health System</td>
<td>No suggestions to improve nearest government health center or it is &quot;good already&quot; (1)</td>
<td>E.3</td>
<td>0/1</td>
</tr>
<tr>
<td></td>
<td>Judge of Distance</td>
<td>Absolute value difference between perceived and real distance to nearest second class health center</td>
<td>E.8,E.20</td>
<td>0-98</td>
</tr>
<tr>
<td>PROVIDER:</td>
<td>Marital Status</td>
<td>Single (0); married, divorced, separated (1)</td>
<td>P.15</td>
<td>0/1</td>
</tr>
<tr>
<td></td>
<td>Children-Ever-Born</td>
<td># of children-ever-born</td>
<td>P.16</td>
<td>0-10</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>Age in years</td>
<td>P.5</td>
<td>21-58</td>
</tr>
<tr>
<td>Work Characteristics:</td>
<td>Type of Facility</td>
<td>Provincial hospital (1); District hospital (2); second class health center (4); Midwifery Center (5)</td>
<td>P.1</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td>No. of Rooms</td>
<td># of rooms in health facility</td>
<td>P.26</td>
<td>2-95</td>
</tr>
<tr>
<td>Work Attitudes:</td>
<td>Family Planning Important</td>
<td>Family planning first or second most important activity of provider (1)</td>
<td>P.33</td>
<td>0/1</td>
</tr>
<tr>
<td></td>
<td>IEC Important</td>
<td>Provider emphasizes information, education and communication to improve local family planning program</td>
<td>P.54</td>
<td>0/1</td>
</tr>
<tr>
<td>Location:</td>
<td>H.F. in a Market</td>
<td>Nearest health facility is in a market (1)</td>
<td>E.2</td>
<td>0/1</td>
</tr>
<tr>
<td></td>
<td>H.F. in Usual Market</td>
<td>Nearest health facility is in respondent's usual market (1)</td>
<td>E.2</td>
<td>0/1</td>
</tr>
</tbody>
</table>
Table 5.2 (Con't).

<table>
<thead>
<tr>
<th>General Type of Variable</th>
<th>Shortened Name</th>
<th>Definition</th>
<th>Source</th>
<th>Range of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAP:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Age</td>
<td></td>
<td>Absolute value difference between wife and nearest government provider</td>
<td>P.5,A.1,A.3</td>
<td>0-54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A.13</td>
<td></td>
</tr>
<tr>
<td>Gap: Marital Status</td>
<td></td>
<td>(Same as provider marital status above)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Children-Ever-Born</td>
<td></td>
<td>Absolute value difference between respondent's and nearest government provider's children-ever-born</td>
<td>P.16,A.15</td>
<td>0-17</td>
</tr>
<tr>
<td>Gap: Education</td>
<td></td>
<td>Absolute value difference between educational level (6 levels) of surveyed head of household and nearest government provider</td>
<td>P.9,P.10,A.12</td>
<td>0-5</td>
</tr>
<tr>
<td>Gap: Family Planning Method</td>
<td></td>
<td>Family planning method of respondent and government provider the same (1)</td>
<td>C.4,P.18</td>
<td>0/1</td>
</tr>
<tr>
<td>Gap: Family Planning Practice</td>
<td></td>
<td>Both respondent and government provider use family planning(1)</td>
<td>C.1,P.17</td>
<td>0/1</td>
</tr>
<tr>
<td>Distance to Family Planning Source</td>
<td></td>
<td>Time traveled to family planning source</td>
<td>C.8</td>
<td>0-360</td>
</tr>
<tr>
<td>Alternative Providers:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contiguous Townships</td>
<td></td>
<td>% of contiguous townships with government health facilities</td>
<td>PA.2,PA.3</td>
<td>20-100%</td>
</tr>
<tr>
<td>with Health Facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Sector Use</td>
<td></td>
<td>Provider reports competition from private sector (1)</td>
<td>P42.1b,P42.2</td>
<td>0/1</td>
</tr>
<tr>
<td>Distance to Drugstore</td>
<td></td>
<td>Distance in kilometers from local health facility to nearest drugstore</td>
<td>P.55</td>
<td>0-5</td>
</tr>
<tr>
<td>Distance to M.D.</td>
<td></td>
<td>Distance in kilometers from local health facility to nearest M.D.</td>
<td>P.1,PA.5.1</td>
<td>0-80</td>
</tr>
<tr>
<td>Distance to Closest</td>
<td></td>
<td>Distance in kilometers from respondent to closest second class health facility</td>
<td>E.6</td>
<td>0.5-98</td>
</tr>
<tr>
<td>Second Class H.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.2 (Con't).

<table>
<thead>
<tr>
<th>General Type of Variable</th>
<th>Shortened Name</th>
<th>Definition</th>
<th>Source</th>
<th>Range of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Closest Health Facility</td>
<td>Type of closest health facility</td>
<td>E.1</td>
<td>0.5-5</td>
<td></td>
</tr>
<tr>
<td>SETTING:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Mills (Poor) Transport Routes</td>
<td># of mills in township*</td>
<td>PA.9.1</td>
<td>0-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condition of major roads or waterways: very good (1)</td>
<td>PA.7</td>
<td>1-5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>...poor (5)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Crops</td>
<td>Corn, cassava, or (mainly) sugar cane imported in township (1)</td>
<td>PA.10</td>
<td>0/1</td>
<td></td>
</tr>
<tr>
<td>Rural Market Location</td>
<td>Ruralness of market where government health facility is located*</td>
<td>PA.9</td>
<td>1-5</td>
<td></td>
</tr>
<tr>
<td>Local Disparities</td>
<td>Coefficient of variation of # of rai (1 rai = .4 acre) owned; or also the standard deviation of the log of the # of rai owned</td>
<td>A.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Township Population Rural-Urban</td>
<td>Total population of township</td>
<td>PA.11</td>
<td>1894-84,953</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urban (1), peri-urban (2,3), rural (4)</td>
<td>A.7.0.1</td>
<td>1-4</td>
<td></td>
</tr>
</tbody>
</table>

* More detailed definition in Appendix A.2, other details in surveys in Appendices C.1 and C.2.

** Key to source of data: P = Health Worker Survey
PA = Health Facility and Township Information (end of Health Worker Survey)
A-E = Peoples' Survey
sections corresponding to the major components of the model: the potential user, the provider, the gap and the setting. The specific questions from which the variables came can be found using the code in Table 5.2 which is referenced to the People's Survey and Health Worker Survey in Appendices C.1 and C.2, respectively.

Before proceeding to the specific variables, however, a few general comments about previous work relevant to these variables can be mentioned. Several large bodies of literature are related to the Family Planning Transaction Model and the variables that compose it. The most generally related are studies of medical/health care services utilization which, though mostly done in the Western context, provide clues to the Family Planning Transaction, in that family planning is often delivered through the same channels as medical and public health care. Also, of general importance is the large and well-developed literature on fertility behavior, which is logically intertwined with the question of family planning use. Examples of the fertility literature (which is most germane to the potential user) are: KAP studies, studies of the determinants of fertility and programmatic studies of the characteristics of family planning acceptors themselves. Other pertinent topics include the homophily-heterophily hypothesis of Rogers (1973) and studies of socio-economic development and fertility decline which are relevant to the gap and setting components, respectively.

A few studies within this diverse literature relate more closely to the present study in their emphasis on more than one component of the
Family Planning Transaction. Good examples are the medical care utilization research which considers both supply and demand side factors (e.g., Feldstein, 1966; Anderson and Aday, 1978;), Mauldin and Berelson's (1978) study on the relative importance of socio-economic factors and family planning program effort to fertility decline in the Third World, and Johnson's (1979) national-level analysis with background and family planning program factors in Malaysia. These studies, however, mostly differ from the present individual-level study in their macro-level approach. Although many studies are related to specific independent variables reviewed in the remainder of this chapter, seldom are these studies directed at the same dependent variables as the present research and therefore certain caveats must be mentioned.

The Potential User Variables

The Potential User: Demographic Variables

Five demographic characteristics of the potential users of family planning were included in the analysis as independent variables: the age of the wife, years married, present marital status, children-ever-born, and child mortality. Fertility has a strong positive relationship to both the age and years married of Thai women (Prasithrathsin, 1976). This, in turn, affects that time when a couple decides to turn to fertility control. Evidence from many Third World countries, including Thailand, has shown that family planning acceptors
have been the older, longer-married and higher-parity women, especially in the early years of a national family planning program (Rele and Ratankar, 1971; Knodel and Pitakepsombati, 1975; Knodel and Prachuabmoh, 1974; Freedman and Berelson, 1976; Laing, 1979). In Thailand this is related to the pattern of delayed marriage and concern over family size limitation only after achieving the desired number of children (Chamratrithirong, 1976). The singulate mean age of marriage in Thailand has been relatively stable, and in 1970 was 21.9 for females, an intermediate figure for Asia (Chamratrithirong, 1979) and Third World countries (Population Reference Bureau, 1980). Spacing, especially for more recently married women, is not particularly important. Further, women with higher fertility (e.g., as measured by children-ever-born) tend to accept family planning more readily than women with lower fertility (Knodel and Prachuabmoh, 1974). This somewhat paradoxical finding is further amplified by sterile or subfecund women who have less need for family planning. Finally, infant and child mortality in Thailand also enter into the interrelationships, being positively related to a mother's age and children-ever-born (Kiranandana, 1978; Knodel and Prachuabmoh, 1974).

The relationship of demographic characteristics of potential users of family planning is less certain with regard to which type of provider they choose. It is possible that unmarried women might prefer the more anonymous drugstores in larger urban areas. This can be tested using the variable for marital status. Also, in the choice of a provider, age also may play a role, with some older women
possibly preferring the older, traditional, non-government providers. In a multitude of studies throughout the world, age has shown a very consistent positive relationship with medical care utilization, as well as possessing interaction with several other important variables such as sex, race, and psychological variables (Rosenthal, 1964; Suchman, 1965; Bice, et. al., 1972). However, such studies, most of which were done in Western countries, give little indication of the importance of age in the choice of government or non-government providers. In Nigeria, Odebiyi (1977) reported the extreme reluctance of adults and older people to patronize modern government health facilities, with only 10% of the outpatients in one area over 18 years old. This is not the case in Thailand, though older people still tend away from the modern or government sector, especially those in their 40s and beyond.

The Potential User: Occupation Variables

In Thailand, women with the highest fertility are those engaged in farming, followed by females employed in sales. Lowest fertility is found for women in services and skilled jobs (Goldstein, 1972). In the survey of outpatient use of government hospitals (Day and Leoprapai, 1977), two occupational groups were disproportionately represented. Farmers greatly underused the hospitals, especially the provincial hospital, and people in the skilled services greatly overused the hospital outpatient facilities. The skilled services category is almost wholly made up of government workers, whose health care costs are
compensated, "usually live close to the hospitals, and as a group have more institutionalized, 'modern' health search behavior" (Day and Leoprapai, 1977, 73). It is probable that this pattern will repeat itself for family planning, especially for the government workers. Therefore, dummy variables for "head of household's occupation: farmer" and "either husband or wife's occupation: government service" were included. A third dummy variable for a "job in the informal sector or not" was included because of the recent interest in these non-institutional occupations in the Third World (e.g., Hackenberg, 1980). Because informal sector jobs may be associated with upward social mobility, people might be influenced to lower their fertility and, hence, adopt family planning. Whether they patronize more "informal" family planning providers is up to conjecture. More detailed breakdowns of agricultural occupations, in that they accounted for 79.5% of the total sample population, were attempted, but it was found that different types of farmers, "wife's occupation: farming," as well as second occupation of head of household were either less significant or not significantly correlated to the dependent variables.

In general, the literature gives us few clues as to what to expect from the occupational variables. Andersen (1968) found Americans of higher status occupations using more medical care, but medical care behavior is substantially different from family planning behavior. Also, cross-cultural comparisons of occupational status are of doubtful validity.
Other socio-economic variables, besides occupation, include "education," "read newspaper" (frequency of reading the newspaper), "no electricity in home," "relatives in home," "native to local area" (percent of life spent in the local area), plus three variables related to the agricultural lifestyle: "double crop rice" (whether rice was double-cropped), amount of "land owned," and "relative land holdings" (land relative to other local farms).

Education. The negative relationship of "education" or, more specifically, "female education" is among the most commonly found in analyses of fertility. This relationship holds significantly for Thai women (Kiranandana, 1978), even when controlling for age and rural-urban residence (Goldstein, 1972). It follows that the more highly educated women are more likely to use family planning and to limit their family size. Given their more "modern" institutionalized behavior, as well as closer connections with the urban sector, we might hypothesize that they also would tend to choose a government family planning provider or a private Western-type doctor practicing in the urban areas.

Support for the inclusion of an education variable in behavioral studies of Third World countries is almost universal. The social and psychological impact of education appears so important as to lead Holsinger and Theisen (1977) to state that, "formal schooling appears to be the single most important variable affecting the acquisition of modern personality dispositions: a strong sense of social and personal efficacy, a positive valuation of time..."
Medical care utilization studies also point out the importance of education. In the United States, persons with more education make more visits to the doctor per year, even after controlling for income (Andersen, 1968; Bice, et al., 1972). In Nigeria, the more educated tend to use the more "Western" medical facilities (Ademuwagun, 1977; Gesler, 1979).

"Read Newspaper." A variable similar to "education," "read newspaper" (frequency of reading the newspaper), indicates whether a person is literate or not, and also approximates a person's contact with the "outside world." This specific variable is less frequently found in the literature; however, studies in Thailand have shown "literacy" to be inversely related to fertility (Goldstein, 1972). In the survey of the medical care use patterns of the people of Suphanburi (Day and Leoprapai, 1977), this surrogate of literacy/communication was negatively related to the use of more traditional providers and positively associated with modern providers. It appears probable that family planning may be related to this variable in a similar fashion.

"No Home Electricity." The Suphanburi survey also found the less modernized rural areas which had not yet been reached by the government's electric grid or special generators tended to use traditional providers, as well as the government second class health centers more. Persons with home electricity tended to use "Western" and government providers more. This variable appears to be a good surrogate of "modernity," if one ventures to promote such a concept, as well as a finer approximation of how far urban amenities have diffused into the
countryside. Home electricity is hypothesized to be positively associated with family planning use and choice of a government provider.

"Relatives in Home." The influence of the extended family may be measured by the number of relatives in the home. This variable for family type may be negatively related to family planning use in that relatives, especially grandparents, may encourage higher fertility while easing the burdens of child care. Families with many relatives in the home also may be viewed as more traditional in general, although non-nuclear family members are common in many households. However, in considering the choice of a public or private family planning provider, there is little evidence what effect this family-type variable would have.

"Native to Local Area." How long a person lives in a local community may limit his exposure to new ideas. This may affect, for example, his knowledge of different methods of family planning or the reputation of available family planning providers. People living in a local area for a long time tend to be more tied to traditional ideas, but they also have increased knowledge of the options in the local community. As these two ideas are working in opposite directions vis-a-vis both the use of family planning and choice of a government provider, the analysis may shed light on the issue.

"Double Crop Rice." As almost 80% of the survey population were farmers, important differentiating information about the agricultural system needed to be taken into account. One variable particular to the
crop regime, whether or not rice was double-cropped, was included. Two crops of rice can be harvested in one year in much of the survey province; however, this is contingent upon the availability of water, i.e., irrigation feeder canals, for the second crop. In recent years in Suphanburi, government projects have extended the system of feeder canals for irrigation. The second crop spells important changes in the life of a farm household. Obviously, there is more farm revenue, though one crop often sufficiently supported a family. Second, the second crop requires many manhours of labor: the traditional easy leisure season for the farmer essentially was done away with. Resulting effects on fertility and choice of family planning provider are unclear. Although double-cropping requires more work, it is doubtful that this would encourage large families for supplemental farm labor. Rather, more seasonal work is required and this can be done by the farming couple itself with extra labor hired if need be, which is often the case in rural Thailand. Less available time may constrain the woman to finding a family planning provider nearby, though that might be either a government or non-government provider. Greater income suggests that more expensive providers at private clinics or drugstores can be taken advantage of. The variable, "double-cropping of rice," though hypothesized to be important, has a complex effect working in different directions on the dependent variables and, therefore, may not reveal a strong, clear, unidimensional relationship.

"Land Owned." The absolute amount of land owned is important in any largely rural farm area: the amount of land owned "constrains
agricultural production patterns and techniques determines the distribution of income, wealth and power," and thus is a "major determinant of class structure in rural areas" (Stokes, et. al., 1979, 1).

The absolute size of land holdings can be interpreted in different ways. The primary reason for collecting data on land size was to indicate rural wealth, with wealth negatively associated with fertility. However, Thai farm households with larger acreage perceive children's work as more beneficial (Arnold and Pejaranonda, 1977) and, indeed, studies have shown a positive relationship between farm size and fertility (Prasithrathsin, 1971; Chalamwong, et. al., 1979). It appears in Third World countries that the positive relationship between the size of land holdings and fertility holds at both the aggregate and individual farm level, except under conditions of dynamic technological change (Stokes, et. al., 1979).

Whether larger land holdings leads to a distinct choice of public or private provider of family planning is less clear. It, in fact, probably should not be of importance: any constraints associated with the rural characteristics of larger farmers ought to be negated by their increased opportunities and mobility due to greater wealth.

"Relative Land Holdings." Perhaps a better indicator of agricultural wealth and opportunity is found in examining the size of a household's farm relative to the local community. "Because the distribution of land is usually the primary determinant of the rural income distribution, it plays a central role in the distribution of
other goods and services" (Stokes, et. al., 1979, 17). People with relatively little land will, in general, have less access to education, health care and other amenities. Although in Thailand family planning is virtually free for the indigent, effects of relative poverty might be manifested through less use of family planning and larger families. It would appear, however, that when the poorer people use family planning, it would likely come from the government rural health centers.

The Potential User: Mobility Variables

Geographic mobility, defined as the propensity of people to travel outside their community, is an important personal behavioral characteristic for rural Thais. The opposite of geographic mobility is isolation and, when placed on a continuum, this variable should be as telling as rural-urban distinctions. People who are more geographically mobile should exhibit more "modern urban" behavior: in general, they ought to be more prone to change, prefer smaller families, and be more likely to use family planning. They also have access to a greater variety of providers of family planning and, therefore, will more likely be able to choose their "optimal" provider. What provider this might be would vary greatly for individuals. In general, the more mobile probably use the private sector, and especially drugstores, more.

Mobility is defined on two different scales. The more local level is measured by trips to the main local market in one month. The national level mobility is gauged by the number of trips to Bangkok in the last five years. In the analysis of medical care use patterns,
trips taken to the provincial capital in the previous year were examined. Mobility, defined at this scale, showed the use of more rural-based practitioners by the less mobile people, as well as the converse, greater use of urban-based providers by the more mobile (Day and Leoprapai, 1977). Although this relationship is, in some ways, intuitive, it shows that the mobility variables, as defined, act in the expected manner. It is also expected that the mobility variables will be related to lower fertility, which is less obvious, and greater use of urban family planning providers.

The Potential User: Health Attitude Variables

One health attitude variable in the medical care utilization literature held to be important is "first entry" into the health system (Andersen, 1975). After people once use a provider, they are much more likely to return. Rahardjo (1979) found that use of public health facilities by pregnant women was a most significant predictor of contraceptive use. "First entry" was defined as the number of different types of government health care facilities a respondent ever-used. This variable was expected to relate closely to the use of a government family planning provider, the rationale being that a person who had used the government public health system for whatever reason would also be likely to take advantage of the government family planning services.

Another health attitude variable was constructed from survey responses on whether the respondent was satisfied with the nearest government health/family planning facility. If the local service was
good or improvements were suggested, the respondent was classified as "satisfied." If he were "satisfied," we might suspect a greater tendency to use that or another government health facility to obtain family planning.

The Provider Variables

For each respondent a set of independent variables related to the nearest government family planning provider was assembled. At the few health facilities with more than one family planning provider, information from the questionnaire of the most senior person was used. The four basic categories of variables included: demographic statistics, work characteristics, work attitudes, and locational information on the health facility.

The Provider: Demographic Variables

Personal demographic characteristics of the provider included in the main analyses were marital status (ever-married or single), children-ever-born, and age. The government providers averaged 31.6 years old, 30% were still single, and those over 35 averaged three children/family. Both married and older family planning providers may be more effective in promoting both family planning and use of government services; however, on the other hand, government providers with larger families should prove less effective. The literature often has hinted at these relationships, especially indirectly in studies of homophily and heterophily (Rogers, 1973).
The Provider: Variables on Work Characteristics and Attitudes

Much data were collected on the size of facilities, amount of equipment and medicine, and similar characteristics, although initial zero-order correlation analyses showed few variables of this type to have significant associations with either family planning use or choice of provider. It appears that, even though more and better facilities and infrastructure have been stressed by Western medical/public health standards and many interviewed Thai public health officials, their real role is smaller than perceived.

For the analysis, two variables on work characteristics were included. One specified the type of facility, that is, whether it was a health station, small district hospital or larger provincial hospital. The other measured the size of the facility, as gauged through the number of rooms available for medical and public health activities.

Work attitudes were represented by two variables. The first was whether the provider considered family planning as one of his two most important duties. A majority did, but many others considered other responsibilities, such as sanitary work, curative care, or maternal and child health as more important. The second variable related to the family planning providers' views on information, education and communication (IEC) in family planning. IEC is a catchword in official family planning circles calling for more communication and motivation to encourage adoption of family planning: posters, media
campaigns and the like. It was the author's feeling that those
government workers who responded that IEC was very important to the
improvement of the government family planning program were actually
using this rationale more as an excuse to cover up their sometimes less
than adequate performance. Therefore, a negative relationship between
this "need IEC" variable and use of the government family planning
provider was postulated. This twist of thinking obviously is contrary
to the opinion of the family planning establishment and runs counter to
results of a recent study of Bertrand and her colleagues (1980) on
performance of community-based distributors in Guatemala. A multiple
regression analysis of urban distributors showed "display of a family
planning poster at a community-based distribution post" and the
"supervisor organizing group meetings" as significant indicators of
(government) performance. Analysis of rural distributors showed
"organizing group meetings" to be significant. These findings, however,
can be interpreted as an indication of the provider's motivation, rather
than the effectiveness of these IEC activities. The inclusion of a
variable on the suggested need for IEC in the present analysis may
clarify this issue somewhat.

The Provider: Location Variables

As the importance of the location of government family planning
facilities was one of the concerns which seeded the original project,
several questions on the locations were asked in the field survey.
Health stations, in general, were more frequently used if they were
located in more-frequently visited market places (Day and Leoprapai, 1977, 85). Other studies have pointed out the importance of location. For example, community-based distributors in Guatemala had significantly higher levels of contraceptive sales if they were located outside of homes or shops (Bertrand, et. al., 1980). The present analysis attempted to test the importance of location through two dummy variables: whether a government family planning facility was located in any market visited by the respondent, and whether it was located in a respondent's usual market.

The Provider: Cost of Service Considerations

Cost of service was not considered because, contrary to what popular wisdom may suggest, cost did not appear as an important deterrent to family planning use. Indeed, in the Philippines, Phillips (1978, 191) found that "moderate supply fees are associated with higher [family planning] continuation rates than no fees at all." For use of outpatient services of Suphanburi government hospitals, less than 10% of the people believed there was a cheaper place with better treatment (Day and Leoprapai, 1988). Ademuwagun (1977) found cost of medical care had a small, but the least influence on the choice of health services used in a study in Nigeria. Family planning costs in Thailand appear not to be a deterrent with pills and condoms dispensed free by the government health facilities and other methods provided cheaper than market price. The more appropriate question regarding costs might be, why do almost 32% of the pill users in Suphanburi (Day and Leoprapai, 1977) buy at the
drugstore for $.45 to $1.00 per cycle (World Bank, 1975, 35) when government pills are free?

The Gap Variables

The third set of variables, dealing with the gap, is predicated on the Family Planning Transaction Model, which affirms not only the importance of the potential users and providers, but also the relative distance, or gap, between them in respect to salient characteristics. The gap variables can be classified into three general categories: 1) gaps between compared characteristics of the user and provider, 2) variables accounting for the geographic distance from the potential user to the provider, and 3) variables representing alternative providers who present an alternative choice to those users not able or wanting to bridge the "gap" between the providers and themselves. For the first category of variables, the gaps were measured by finding the absolute value of the difference between the values of the variable for the potential user and the closest government family planning provider. These variables are, therefore, mainly relevant to the analysis of the choice of a family planning provider, though they were included in the analysis of family planning use as well.

There is little, conceptually, in the family planning literature to tie in with our gap, distance, or alternative provider variables. There is, however, some reference to the variables that follow in different studies.
The Gap: The Compared-Characteristics Variables Gap

The closest theoretical tie in the family planning literature with the gap variables is the homophily-heterophily studies based on Rogers (1973). This hypothesis posits that success in communications and interaction, and by extension, provision of family planning, is greater when there is greater similarity ("homophily") between the conveyor of information and the receiver (in family planning, for example, between the field worker and potential adoptor). The exception to this is that the conveyor of information (e.g., adoption agent, family planning provider, etc.) should have good technical expertise in the family planning methods he promotes in contrast to the potential adoptor ("heterophily") to facilitate success, i.e., adoption of family planning. Important characteristics for similarities are age, marital status, parity, and education. In general, studies have found older married women with a few children performed better as family planning workers (Worth, et. al., 1971; Ross, et. al., 1972; Rogers, 1973; Repetto, 1977; Azcona, et. al., 1980). These characteristics make field workers more like their prospective clients, as does less formal education which has sometimes also been found to be important. Nevertheless, there is a partial flaw in the methodology which has been used to support the homophily-heterophily hypothesis. The field worker's (or provider's) characteristics are often compared to aggregate group statistics for potential users, when the theory stipulates similarity between the provider and individual potential user is what
facilitates performance success. There exists in this experimental design the possibility of an ecological fallacy, attributing what holds on an aggregate level to the individual level. This problem can be overcome by matching individual characteristics of field workers (or providers) and potential adopters, which was done for the Suphanburi survey. Such data collection is more tedious and expensive, but the analytic results allow firmer interpretations. In essence, given their methodological design, the homophily-heterophily experiments do not really measure the gap between potential user and provider, but, rather, characteristics of the provider himself.

To test the most common findings from the homophily-heterophily studies, it was hypothesized that similar marital status and a small gap between age, children and education ought to be associated with use of the provider. In addition, similarities in whether both the provider and potential user were currently using family planning and the same particular method, were suggested to be related to use of a government family planning provider.

The Gap: Distance Variables

Two variables accounting for the distance gap between the potential user and provider also were entered into the analysis. Specifically, users of family planning reported how far they traveled for provision of family planning. We hypothesized users of private family planning providers to go longer distances, the government health facility often being a provider of convenience, but not choice.
A second distance gap variable measured the absolute distance to the closest government family planning facility. A long distance itself can discourage use, and at the same time increase the number of alternative providers that may be located between the potential user and the government provider. Studies quite frequently have pointed to distance as a deterrent to use; for example, of health centers in India (Rao and Richard, 1970) and in Nigeria (Gesler, 1979), and family planning outlets in Nepal and rural Colombia (Family Planning Perspectives, 1980). Therefore, it appears plausible to suggest a negative relationship between distance to the closest government family planning facility and use of that family planning facility.

Because both provincial and district hospitals provide a full range of family planning methods and thereby have greater attraction power, a variable was included to indicate what size or type of facility was the closest to the respondent's home. This variable, the "type of closest facility," may affect the distance people will travel to that place. This variable, however, is quite similar to the provider variable for "type of facility, and was eventually replaced in the analysis by it.

The Gap: Alternative Provider Variables

If a sizable gap or distance exists between the potential user and provider, then the possibility of using an alternative provider increases. Considered in another way, the alternative family planning provider, if chosen, then acts as a "barrier" to the family planning transaction between the potential user and the government family planning provider.
There are several different alternative private and public providers of family planning that have been discussed in Chapter IV. There are also several different ways to measure the importance of these providers. Four variables have been selected to represent these gap-related concepts.

In some places there is a higher density of government family planning facilities. A local person may have reasonable access to more than one place, and to approximate this, the percentage of contiguous townships with government health/family planning facilities was calculated. Townships (tambon) often are not large in area, some as small as about ten square kilometers, and at times the neighboring township family planning provider may be located right across the river from the local government family planning provider or, as found in one case, right across the street. Neighboring government facilities can draw from each other and, therefore, the completeness of the health/family planning system nearby should be negatively related to use of the local township government family planning provider.

The prevalence of private providers of family planning, seen as alternatives to the local government facility, should decrease the use of the local government provider. The extent of "private sector use" activities was estimated from the local government family planning workers' responses to the question of whether or not private sector health and family planning providers were used by the local people.

Two other variables were included to account for the prevalence of alternative providers. These variables measured the distance to
the most widely-used private sources of family planning: the drugstore and (western-type) Medical Doctor. It was hypothesized that the shorter the distance, the greater the competition and, therefore, the less frequent the use of the local government provider.

The Setting Variables

The social milieu which provides the backdrop for human behavioral decisions is important, but how to create variables which appropriately guage and meaningfully distinguish between the social settings in different places is a difficult task. In predominantly rural upcountry provinces in Thailand, like Suphanburi, it is important to get a handle on at least two aspects of a community: first, its degree of isolation or, conversely, how close it is to the modern interconnected urban and economic systems; and, second, because of the overwhelming importance of farming, some indicator of the important aspects of the agricultural system and its effects on the community.

The degree of isolation of a community may be approximated through two variables: rural/urban status and the conditions of transport routes. A five-category rural-urban continuum (later collapsed to four categories) was constructed after the field survey, to more accurately portray the degrees of "urbaness" and "ruralness" of the population. Subsequent research on the viability of a rural-urban continuum in Thailand by Goldstein and Goldstein (1979) and Sermsri (1980) has substantiated the usefulness of such a classification. It
should be noted, however, even with this more fine-tuned definition of urban, still over three-fourths of the population in Suphanburi fell into the most rural category. The second setting variable attempting to measure isolation gauged the quality of local transport routes on an ordinal five-point scale. Transport routes included paved and unpaved roads for a majority of the communities, though two districts in the flood plains relied heavily on waterways. It was hypothesized that more isolated areas, as measured by "ruralness" and poor transport links, would have less family planning users, and that these users would take more advantage of the government family planning provider for lack of an alternative.

To approximate the agricultural setting of the different townships, a dummy variable was chosen which measured whether a community predominantly grew field crops or not, most areas in Suphanburi being either predominantly rice or field crop areas. "Field crops," in essence, stands for sugar cane areas, with a few areas growing cassava or corn. The sugar cane is a profitable crop for most farmers and is areally associated with the western, more recently settled half of the province. Possibly, communities with "field crops" might tend to have more family planning users because of the relative prosperity of the area. There is nothing to indicate, however, whether they would opt for government or private providers.

Also related to the agriculture setting was a variable which measured the economic disparities in a community. Relative inequality in the township was measured by taking the amount of land owned by
each farmer and calculating the coefficient of variation for the whole township. It was hypothesized that greater disparities would be associated with less use of family planning. Its particular association with a government or non-government provider is difficult to suggest.

Two other social setting variables were included in the analysis. To gauge non-farm economic activity, the number of mills in a township was calculated. To test the importance of a market setting for the government family planning facility, the type of market center it was in was recorded. Both of these variables ought to relate positively to family planning use, and the market location should, ideally, increase the usage of the government family planning provider due to better accessibility.

Chapter Summary

Chapter V was concerned with the data base of this study. It began by stating the specific hypotheses on the relative importance of different components of the Family Planning Transaction Model which can be empirically tested. Second, the data collection procedures for the Suphanburi surveys of 1977, the source of data for this analysis, were reviewed. Next, the basis of the dependent variables, family planning use and provider choice, was discussed, and last, for the major portion of the chapter, the relevant literature and the rationale underlying the choice of the almost 50 independent variables analyzed empirically were
detailed. A summary list of all these variables, found in Table 5.2, may be useful to refer to in reading through the analysis in Chapter VI.
CHAPTER VI

THE ANALYSIS: DIFFERENTIAL USE OF PUBLIC AND PRIVATE SECTOR
FAMILY PLANNING PROVIDERS IN SUPHANBURI PROVINCE

Introduction

In many ways the preceding chapters were building blocks for the present chapter which contains the principal analysis of this dissertation. The early chapters emphasized the historical emergence and contemporary organization and delivery strategies of national family planning programs in the Third World context. Chapter III discussed the two conceptual models which provided the framework for the dissertation. In Chapter IV the focus turned specifically to Thailand and to the rapid growth of its family planning delivery network since the late 1960s. Chapter V then described the Suphanburi survey data set and the rationale underlying specific variables within the model of the family planning transaction. This permitted hypotheses on the major factors behind the use of family planning and the choice of a provider.
Chapter VI constructs an operational model to test the relative importance of the four components of the conceptual model. The major aims of this chapter are to test the appropriateness of the model of the family planning transaction and to uncover the important factors underlying the use of family planning and the choice of a public and private distributor. The chapter will proceed first by briefly discussing the dependent variables, second, reviewing the interpretive aspects of discriminant analysis, and third, using that method to test the hypotheses for different dependent variables.

All parts of the chapter will address two questions. The primary question is why do people go to a particular provider of family planning: why do they go where they do? Four possible types of providers will be investigated: the government public health/family planning facilities, the private "modern" medical care providers, drugstores and local "traditional" practitioners. The secondary question asks why do people use family planning in the first place. This question is not the primary research question, but is logically antecedent to "why people go to a certain family planning provider" and is, therefore, analyzed before proceeding to reasons behind the choice of a certain type of provider. Both these two research questions may be viewed as different approaches to understanding the family planning transaction.

The operational model mirrored the conceptual model as closely as possible. The four major components of the family planning transaction (the potential user, provider, gap and setting) served as the principal
focal points of the independent variables. Subsumed under each component were individual variables which measured important aspects of that component. In that this study is a broad behavioral study with individual-level data, a complex assortment and somewhat extensive number of variables needed to be tested to determine their importance. Figure 6.1 shows the basic organization of the variables. A major aim of the empirical analysis to follow is to find out which specific variables, as well as which general components, are relatively more important in distinguishing between users and non-users of family planning and between users of the government and private delivery systems.

The Method: Interpretive Aspects of Discriminant Analysis

Discriminant analysis, the major analytical tool of this dissertation, takes nominal-level dependent variables made up of a specified number of groups or categories and finds out how well a weighted linear combination of independent variables (of any measurement level) can explain differences and discriminate between the groups. The nominal-level dependent variable can be binary, in which case discriminant analysis is essentially the same as a multivariate regression on a dummy dependent variable (Lehinann, 1979, 506), or it can include several groups. The present dissertation uses dependent variables with both two and four groups.
Figure 6.1. The Four Components of the Family Planning Transaction: Operational Model
At least three major statistical aspects of discriminant analysis facilitate the researcher's interpretation of his results: 1) tables with the percentage of cases in each group correctly classified, 2) statistics which judge the importance of the discriminant function, and 3) several statistics which help judge the relative importance of the independent variables. Each of these will be discussed in turn.

The Classification Table

The classification, or "hit-miss," table is the principal overall indicator of "success" in discriminant analysis, which has the goal of building a discriminant function that will correctly classify as many of the cases as possible. The percent correctly classified, in fact, can be considered somewhat analogous to $R^2$ in regression (Lehinann, 1979). However, the classification table should not be interpreted without caution. Firstly, the percent correctly classified should be tested statistically against some criteria based on probabilities of chance classification. None of the three major packaged programs for discriminant analysis, BMDP, SPSS, and SAS, do this and therefore it was necessary to calculate the tests by hand. Lehinann (1979) presents four criteria with which the percent correctly classified can be compared. Two of these statistics were calculated for the classification tables in this dissertation: one, to determine if the percentages are significantly different than random classification probabilities, and a second statistic, sometimes called the "fairest" criterion, based on both the probability of group membership and the fraction assigned to
each group (Mosteller and Bush, 1954). The "fairest" criterion yields a hypothetical percent classified which can then be compared with the actual results. All the percent classified for the tables in this analysis proved significant under these criteria.

A second reason the classification table should be viewed with some caution is because there is a slight upward bias in the percent correctly classified. This is because the same observations that were used to create the discriminant function are also classified by that function. A way to remedy this bias is by building a jackknived classification matrix where "each case is classified into a group according to the classification functions computed from all the data except the case being classified" (Jennrich and Sampson, 1979). The BMDP packaged discriminant program includes an option for jackkniving and, as the BMDP program was run on the analyses to check with the SPSS programs that were used in the final analyses, differences in the two methods could be compared. Jackkniving lowered the percent correctly classified only by about 1% or less. This negligible difference could be expected given the large sample size of the present data set.

The Discriminant Function

Besides the classification matrix, discriminant analysis provides statistics which allow the researcher to judge the importance of the discriminant functions. Two of these statistics, the eigenvalue and canonical correlation, measure the relative importance of each discriminant function in a multi-group discriminant analysis. Sometimes
the maximum number of discriminant functions (one less than the number of groups) is not needed, and the researcher may choose to eliminate later functions of little relative importance in order to simplify interpretation. The magnitude of the eigenvalues and canonical correlations can also suggest the power or "clout" of the discriminant function. A further interpretation of the canonical correlation is that when it is squared it represents the proportion of variance in the discriminant function explained by the groups (Klecka, 1975). A third statistic, Wilks' lambda, measures the amount of discriminating power added by each discriminant function. This in turn can be transformed into a Chi-square statistic and tested for statistical significance (Klecka, 1975).

Statistics on the Independent Variables

A third, and very important, interpretative aspect of discriminant analysis are several statistics which help judge the relative importance of the independent variables. The statistics of this type in our tables are the univariate and final F ratios (or "F values"), differences in group means and the standardized discriminant function coefficients.

A stepwise procedure was used to enter independent variables into the analysis on the basis of their discriminating power. The selection criterion was the Wilks' method which maximizes the overall multivariate F ratio in a test of differences among the group centroids (Klecka, 1975, 447). This method was selected because overall discrimination rather than discrimination between different pairs of groups, was the
analytic aim of the study. Further, the choice of method was not considered crucial to the analyses because most were two-group discriminant analyses which have essentially identical results using any of the five algorithms in the SPSS program.

The important output of the stepwise procedure are F values. A univariate F ratio for each eligible independent variable is calculated before the entrance of any variable into the analysis. These calculations are equivalent to a one-way analysis of variance test for the variable. The independent variables are then entered into the analysis one-by-one on the basis of the highest F value. At each step partial F ratios are recalculated and the next variable entered on the basis of the most additional discriminating power contributed. The entry of variables was cut off when newly-entering F ratios failed to be significant at .10 (that is, when there was greater than a 10% chance the difference in group centroids could be due to chance). Significance at the .10 level represented an F-ratio of 2.3 to 2.7 given the degrees of freedom in the analysis. The tables of F values following in this chapter are revealing for they show both the relative importance of each independent variable (with the final F ratio) and the individual importance of each variable (through the univariate F ratio).

The means of the variables for the groups can also suggest whether or not a variable is an important discriminator between the groups. "If all the variables have approximately the same standard deviation and there is relatively little correlation among the independent variables, the size of the differences between the means will provide the same
ranking of the importances of the variables in discriminating as the size of the discriminant coefficients" (Lehmann, 1979, 507). Although group means for the variables in some ways duplicate information provided by the F ratios and standardized discriminant coefficients, they often can give the researcher a good initial feel for differences in the variables. They also are unique in that they present real averages of the data and can be readily and intuitively interpreted. To see the mean age or mean education for each group is helpful in describing real differences in the groups. For these reasons group means have been included for each analysis along with the F values.

A final useful statistic for judging the importance of the independent variables is the standardized discriminant function coefficient. The coefficients are analogous to beta weights in multiple regression: their magnitude represents their relative contribution to the function while the sign denotes a negative or positive contribution. At times, all the signs for a discriminant function will be exactly opposite the expected sign because the function is operating in the other direction. In these cases the signs were reversed to ease interpretation for the reader. Finally, the standardized discriminant function coefficients are calculated only for variables which enter the final classification equation.

Summary

In summary, discriminant analysis can be viewed as an appropriate technique to test this study's conceptual model. It should tell how
well the users of different sources of family planning can be grouped. It also shows which variables are most important in distinguishing between the different groups. Therefore, the empirical analysis should come up with some tentative answers to which components (the potential user, the provider, the gap, or the setting) are of greatest importance in the model, assuming that the variables in the analysis can measure the important characteristics to be tested. Discriminant analysis is a robust and versatile statistical technique and provides several interpretable statistics. In the analyses, the classification tables will be presented first, then a table of the means, the univariate and final F values, standardized discriminant function coefficients (or their signs), and last, information on the discriminant function. The analysis will first examine use or non-use of family planning as preliminary to the principal analysis for discriminating between users of different types of family planning providers.

The Analysis: Discriminating Between Use and Non-Use of Family Planning

Before analyzing the differences between people who go to different types of family planning providers, a question might be raised about what kind of people in our predominantly rural area are users or not users of family planning. The answer to this question will provide a description of the population to be analyzed for "use of different providers." It will also tell what type of people are more amenable to
family planning. This analysis is similar in some ways to analyses of the characteristics of family planning acceptors or the determinants of family planning acceptance, but it goes further than these types of analyses usually do, for the analysis takes characteristics of the provider, setting and gap into account, as well as characteristics of the acceptors. It also distinguishes between users and non-users (acceptors and non-acceptors) on the basis of their most important characteristics. In short, the present analytical approach has attempted to be comprehensive in scope in order to come closer to a definitive answer to what are the important factors underlying use of family planning.

In examining use and non-use of family planning we will analyze two dependent variables: current use and ever-use of family planning. The basic distinction between these two dependent variables is that ever-use can account for women's family planning behavior over a span of time and allows older women to be a meaningful part of the sample, while current use defines use just for the time of the survey. However, in general, these two dependent variables are quite similar. Current users, in fact, are a sub-population of the group of ever-users. In the analysis these two dependent variables will be viewed as two definitions for the same basic phenomenon. Therefore, the results for "not current use"/"current use" and "never-use"/"ever-use" will be discussed at the same time. The results for both analyses were quite similar and therefore tend to reinforce each other.
The classification tables for the discriminant analyses of use/non-use of family planning with 48 independent variables (Tables 6.1 and 6.2) show 69.4% correctly classified for analysis of current users and 73.2% for ever-users. Given that this is a human behavioral study with data on the individual level, the level of correct classifications appears good. The tables show also that it was somewhat easier to classify users than non-users, the users appearing to be a little more homogenous in respect to the important discriminating variables.

A quick overview of the significance of the F ratios (Table 6.3) shows personal characteristics of the potential user to have clearly the greatest discriminating power relevant to the use or non-use of family planning. Of secondary importance are some gap variables. Of some note are a few setting variables, and lastly, only one provider variable has much significance. The important variables under each of the four components will be discussed in the following paragraphs in the order the components occur on Table 6.3.

The Potential User Variables

The large number of potential user variables with significant F ratios is quite noteworthy. The first five variables, which all have univariate F ratios significant at the .001 level, represent demographic characteristics. Also of importance are the mobility variable, trips to market, and two health attitude variables: entry into the health system and satisfaction with the health system. Several potential user variables have significant original F ratios but never enter the
Table 6.1. Classification Results for Discrimination Between "Not Current Users" and "Current Users" of Family Planning.

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>No. of Cases</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Current Users</td>
<td>707</td>
<td>481</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(68.0%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>226</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(32.0%)</td>
</tr>
<tr>
<td>Current Users</td>
<td>631</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(29.0%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>448</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(71.0%)</td>
</tr>
</tbody>
</table>

Percent of "Grouped" Cases Correctly Classified: 69.4%.
### Table 6.2. Classification Results for Discrimination Between "Never Users" and "Ever Users" of Family Planning.

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>No. of Cases</th>
<th>Predicted Group Membership</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Never Users</td>
<td>Ever Users</td>
<td></td>
</tr>
<tr>
<td>Never Users</td>
<td>512</td>
<td>364</td>
<td>148</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(71.1%)</td>
<td>(28.9%)</td>
<td></td>
</tr>
<tr>
<td>Ever Users</td>
<td>826</td>
<td>211</td>
<td>615</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25.5%)</td>
<td>(74.5%)</td>
<td></td>
</tr>
</tbody>
</table>

Percent of "Grouped" Cases Correctly Classified: 73.2%.
Table 6.3. Effectiveness of Variables in Discriminating Between Users and Non-Users of Family Planning.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Not Currently Using</th>
<th>Currently Using</th>
<th>Univariate F-Ratio</th>
<th>Final F-Ratio</th>
<th>Current Use</th>
<th>Ever-Use</th>
<th>Never Use</th>
<th>Ever Use</th>
<th>Univariate F-Ratio</th>
<th>Final F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USER:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Marital Status</td>
<td>.958</td>
<td>.994</td>
<td>15.28***</td>
<td>-</td>
<td>.942</td>
<td>.994</td>
<td>28.99***</td>
<td>(+)</td>
<td>5.34**</td>
<td></td>
</tr>
<tr>
<td>Age of Wife</td>
<td>43.26</td>
<td>36.13</td>
<td>145.2 **** (-)21.62****</td>
<td>46.02</td>
<td>36.32</td>
<td>270.9 ****</td>
<td>(-)192.9 ****</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years Married</td>
<td>21.34</td>
<td>14.86</td>
<td>130.1 ****</td>
<td>-</td>
<td>23.49</td>
<td>15.23</td>
<td>205.5 ****</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>5.84</td>
<td>4.33</td>
<td>77.33**** (-)6.03**</td>
<td>6.07</td>
<td>4.58</td>
<td>65.27****</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Mortality</td>
<td>.900</td>
<td>.485</td>
<td>36.56**** (-)3.25*</td>
<td>.944</td>
<td>.560</td>
<td>28.34****</td>
<td>(-)4.84**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occ: Farmer</td>
<td>.865</td>
<td>.828</td>
<td>2.83</td>
<td>-</td>
<td>.875</td>
<td>.832</td>
<td>3.60*</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occ: Government</td>
<td>.013</td>
<td>.023</td>
<td>1.52</td>
<td>-</td>
<td>.011</td>
<td>.022</td>
<td>1.73</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occ: Informal Sector</td>
<td>.162</td>
<td>.181</td>
<td>.67</td>
<td>-</td>
<td>.143</td>
<td>.187</td>
<td>3.32*</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>2.64</td>
<td>2.96</td>
<td>33.18****</td>
<td>-</td>
<td>2.56</td>
<td>2.92</td>
<td>37.92****</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Home Electricity</td>
<td>1.77</td>
<td>1.74</td>
<td>1.21</td>
<td>-</td>
<td>1.77</td>
<td>1.75</td>
<td>.97</td>
<td>(-)</td>
<td>3.36*</td>
<td></td>
</tr>
<tr>
<td>Read Newspaper</td>
<td>4.89</td>
<td>5.84</td>
<td>2.93*</td>
<td>-</td>
<td>4.40</td>
<td>5.89</td>
<td>6.60****</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatives in Home</td>
<td>.773</td>
<td>.691</td>
<td>.81</td>
<td>-</td>
<td>.844</td>
<td>.672</td>
<td>3.21*</td>
<td>(-)</td>
<td>4.90**</td>
<td></td>
</tr>
<tr>
<td>Native to Local Area</td>
<td>.777</td>
<td>.739</td>
<td>3.50*</td>
<td>-</td>
<td>.779</td>
<td>.747</td>
<td>3.17</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Land Holdings</td>
<td>1.11</td>
<td>.93</td>
<td>6.18**</td>
<td>-</td>
<td>1.19</td>
<td>.94</td>
<td>10.59***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Owned</td>
<td>24.06</td>
<td>21.08</td>
<td>1.09</td>
<td>25.77</td>
<td>21.47</td>
<td>3.87**</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trips to Market</td>
<td>4.91</td>
<td>5.51</td>
<td>12.16*** (+)9.55***</td>
<td>4.82</td>
<td>5.41</td>
<td>10.92****</td>
<td>(+)7.28***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry into H. System</td>
<td>2.38</td>
<td>2.64</td>
<td>13.99*** (+)6.90***</td>
<td>2.30</td>
<td>2.62</td>
<td>20.87****</td>
<td>(+)9.88***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction w/H. System</td>
<td>.448</td>
<td>.361</td>
<td>8.55*** (-)7.31**</td>
<td>.475</td>
<td>.367</td>
<td>11.81****</td>
<td>(-)9.97***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PROVIDER:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>.799</td>
<td>.838</td>
<td>2.71*</td>
<td>-</td>
<td>.798</td>
<td>.829</td>
<td>1.51</td>
<td>-</td>
<td></td>
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<tr>
<td>Children-Ever-Born</td>
<td>1.72</td>
<td>1.63</td>
<td>.51</td>
<td>-</td>
<td>1.75</td>
<td>1.64</td>
<td>.76</td>
<td>-</td>
<td></td>
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<tr>
<td>Age</td>
<td>31.94</td>
<td>32.04</td>
<td>.04</td>
<td>31.86</td>
<td>32.06</td>
<td>.15</td>
<td>-</td>
<td>-</td>
<td></td>
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<tr>
<td>Type of Health Facility</td>
<td>3.736</td>
<td>3.733</td>
<td>.01</td>
<td>3.719</td>
<td>3.743</td>
<td>.28</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>No. of Rooms</td>
<td>4.01</td>
<td>4.14</td>
<td>.90</td>
<td>4.02</td>
<td>4.11</td>
<td>.35</td>
<td>-</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>F.P. Important</td>
<td>.594</td>
<td>.674</td>
<td>7.30*** (+)9.30***</td>
<td>.589</td>
<td>.657</td>
<td>4.95***</td>
<td>(+)10.71***</td>
<td>-</td>
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<tr>
<td>I.E.C. Important</td>
<td>.744</td>
<td>.759</td>
<td>.36</td>
<td>3.740</td>
<td>.758</td>
<td>.40</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Variables</td>
<td>Means</td>
<td>Ever-Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Not</td>
<td></td>
<td></td>
<td>Never</td>
<td>Ever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Currently Using</td>
<td>Currently Using</td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
<td>Use</td>
<td>Use</td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAP:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Age</td>
<td>14.38</td>
<td>9.43</td>
<td>90.90**** (-) 4.17**</td>
<td>16.04</td>
<td>9.70</td>
<td>141.9 ****</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Children-Ever-Born</td>
<td>4.48</td>
<td>3.19</td>
<td>58.78**** -</td>
<td>4.63</td>
<td>3.42</td>
<td>46.37****</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Education</td>
<td>2.35</td>
<td>2.05</td>
<td>41.43**** (-) 8.07***</td>
<td>2.41</td>
<td>2.09</td>
<td>40.37**** (-) 2.65</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: F.P. Practice</td>
<td>.557</td>
<td>.559</td>
<td>.004     -</td>
<td>.560</td>
<td>.557</td>
<td>.01      -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alt: Contiguous townships w/H.F.</td>
<td>.689</td>
<td>.728</td>
<td>6.28** -</td>
<td>.678</td>
<td>.725</td>
<td>8.21* -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alt: Private Sector Use</td>
<td>.376</td>
<td>.418</td>
<td>1.92     -</td>
<td>.374</td>
<td>.409</td>
<td>1.27 -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alt: Dist. to Drugstore</td>
<td>.71</td>
<td>.69</td>
<td>.06      -</td>
<td>.68</td>
<td>.72</td>
<td>.33 -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alt: Distance to M.D.</td>
<td>19.93</td>
<td>19.26</td>
<td>.36        -</td>
<td>20.13</td>
<td>19.30</td>
<td>.50 -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Closest H.F.</td>
<td>1.90</td>
<td>1.96</td>
<td>1.02     -</td>
<td>1.90</td>
<td>1.94</td>
<td>.67    -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SETTING:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Mills</td>
<td>1.22</td>
<td>1.21</td>
<td>.08      -</td>
<td>1.23</td>
<td>1.21</td>
<td>.15    -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Routes</td>
<td>3.12</td>
<td>2.95</td>
<td>3.26* -</td>
<td>3.18</td>
<td>2.96</td>
<td>5.44** (-) 4.21*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Crops</td>
<td>.498</td>
<td>.567</td>
<td>5.06** -</td>
<td>.499</td>
<td>.550</td>
<td>2.59 -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Market Location</td>
<td>3.87</td>
<td>3.88</td>
<td>.02     -</td>
<td>3.88</td>
<td>3.87</td>
<td>.003 -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Disparities</td>
<td>1.728</td>
<td>1.764</td>
<td>4.55** (+) 2.94*</td>
<td>1.714</td>
<td>1.754</td>
<td>3.10* -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural-Urban</td>
<td>3.782</td>
<td>3.769</td>
<td>.14    -</td>
<td>3.775</td>
<td>3.777</td>
<td>.00 -</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6.3 (Continued)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Overall F-Statistic</td>
<td>23.05</td>
</tr>
<tr>
<td>Final x²</td>
<td>207.26</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>.218</td>
</tr>
<tr>
<td>Canonical Correlation</td>
<td>.423</td>
</tr>
<tr>
<td>Final Wilkes Lambda</td>
<td>.821</td>
</tr>
<tr>
<td>% Correctly Classified</td>
<td>69.4%</td>
</tr>
<tr>
<td>Sample N</td>
<td>1066</td>
</tr>
</tbody>
</table>

* = .10 level of significance  
** = .05 level of significance  
*** = .01 level of significance  
**** = .001 level of significance

- Insufficient F Ratio (>.10 level of significance) to enter final equation.

\(^a\)Abbreviations listed in Appendix A.1.

\(^b\)Signs (taken from discriminant coefficients) denote the direction of the relationship with family planning use.
discriminant function because of being preempted by more powerful variables with which they share common discriminating power. This is especially true of education, years married, and land holdings. Education was bypassed after the entrance of the age of wife and the gap in education.

Among the potential user variables, especially significant are those related to demographic characteristics. The means indicate a consistent demographic description: non-users of family planning tend to be older, longer married women with more children and, consequently, with more children who have died. In that any older women who reported that family planning was not available when they were fecund were eliminated from the analysis, these demographic variables can be interpreted in an historical context. There has been a rapid increase in the percentage of fecund women in Thailand in the last two decades who have decided to use family planning and limit their family size. The attitudes of the more recent generations of Thai parents have changed towards distinctly smaller family norms, while at the same time many different and new methods of family planning have become accessible throughout the country.

The means for several characteristics of the potential user had significant F ratios and yielded in general the expected relationships. The variable "female marital status" indicates women not presently married are less inclined to use family planning. This would obviously be expected in such a study, but the fact that the means for "not current users" is not lower than "never-users" is hard to explain.
Education, measured both by levels of education completed and frequency of reading the newspaper, shows a positive relationship with family planning use. People who use family planning are slightly more likely to have electricity in their home (electricity in home = 1, no electricity in home = 2), while those respondents with more relatives living in their homes (i.e., an extended family) tend to use family planning less. The variable, "trips to market," indicates that more mobile people are more likely to use family planning.

The government health system attributes also show significance: "entry into the health system," the number of different types of government health facilities a respondent has ever visited, is positively associated with use of family planning. This partly reconfirms past health care utilization literature which stresses the importance of "first entry" into health systems in facilitating later use. In Thailand, experience with a government health system for medical care or shots for example, possibly increases the use of family planning. A health attitude variable, satisfaction with the local government family planning facility, showed a somewhat unexpected negative relationship with family planning use. One might expect more satisfied women more likely to be users, but it appears the opposite is true. The women who use family planning are more critical of the activities of the health center closest to home.
The Provider Variables

Examining the means of variables subsumed under the provider component of our family planning transaction model, we find very few differences except for the one significant variable, "family planning important." This variable is a dummy variable with "1" assigned to those interviewed government public health/family planning officials who reported family planning as their first or second most important activity. As this variable indicates not only the existence of an official government family planning worker in the nearby area but also his stated interest in family planning, its positive association with family planning use should be encouraging to exponents of the government family planning program.

The Gap Variables

Several of the gap variables have highly significant univariate F ratios that never enter the final equation. These appear to be mainly demographic variables which are associated with, but not as important as, the demographic variables of the potential user. The differences in group means show a distinct negative relationship between use of family planning and the age gap, the children-ever-born gap, and the education gap. Users of family planning tend to have smaller differences between the local government health worker and themselves on these variables. However, this cannot be viewed as an adequate test for the original hypothesis on the "socio-economic gap." We are mainly interested in how the differences in the gap specifically affect the use of the
government provider of family planning. This is the subject of the next section of this chapter. In some ways it is a little tenuous to analyze the socio-economic gap variables at this point; however, they were included to make all analyses comparable. That being the case, it is interesting to note the discriminating strength of a few of these variables.

The Setting Variables

The differences in means in the more important "setting" variables yielded interpretable results. Conditions of local transport routes, both roadways and waterways, were ordinarily categorized from very good (1) to poor (5). People living in areas served by poorer transport routes, areas with poorer accessibility and more remote locations, tended slightly (but significantly) to use family planning less. Places where field crops, mainly sugar cane, were grown, were areas of noticeably more use of family planning. These areas tend to have richer farmers with larger farms, which also tend to be more mechanized than the wetland rice farms. The rural-urban variable, which might be thought to be a good general surrogate for much of the differences in settings, has virtually no discriminating power.

The third variable showing some differences in group means was the local disparities, or inequities variable. Local disparities, or vast differences between the rich and the poor people in an area was approximated by calculating the standard deviation of the log of the amount of land owned (Yotopoulous and Nugent, 1976). Land owned was
measured in rai, with 1 rai = .4 acre. The logic behind using such a variable is that the standard deviation measures the extent of dispersion from the mean: the greater the variation in land owned, the greater the inequalities that exist. The logarithm of the amount of land owned was taken in order to diminish the importance of large values. What it did, somewhat perversely, was also emphasize the very small values (of land owned). Because a logarithm of zero cannot be calculated, all respondents who had no land (which was a sizeable group) were arbitrarily assigned one-half of a rai. These small numbers along with the other small amounts of land owned soon became the dominant force of the statistic. Thus, the significant relationship of this variable, "local disparities," actually indicates places with landless people among others with a moderate or greater plot of land have greater use of family planning. This is the opposite of our hypothesis that greater inequalities should be associated with less family planning use. In order to test this hypothesis, possibly our statistical calculations should be made simpler and more interpretable by using a more common index of inequality, for example, the coefficient of variation. Nevertheless, this finding is interesting for it suggests inequalities in land distribution may be associated with lower fertility, possibly among the landless.

Summary

Summarizing the discriminant analyses for use/non-use of family planning, we have found characteristics of the potential user the most
important. Gap variables were of secondary importance, although they were not specifically designed for the analysis of family planning use per se. Of much lesser importance were the variables representing the provider and setting components of the Family Planning Transaction Model. Especially important discriminating variables among the potential user variables were several demographic characteristics and two health attitude indicators.

The Analysis: Discrimination Among Different Types of Family Planning Providers

With these tentative conclusions on family planning use, the study now proceeds to a discriminant analysis on the four most common types of family planning providers in Thailand (local/traditional sources, drugstores, private/western M.D.'s, and official government sources), and then with the three private sector groups of providers combined together, the government and non-government providers. The results of the four-group and two-group analyses will be discussed together because of our principal interest in people who use or do not use the government providers and also because the results of the analyses are somewhat similar. The discriminant analysis was carried out with 42 and 44 individual variables, nine of which entered both the four-group and the two-group analysis to construct the discriminant function. The resultant classification Tables 6.4 and 6.5 correctly classified 39.2% and 60.9% of the cases, respectively. Interestingly, the ungrouped
Table 6.4. Classification Results for Discrimination Among Users of Four Different Types of Family Planning Providers.

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>No. of Cases</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Users of Local Providers</td>
</tr>
<tr>
<td>Users of Local Providers</td>
<td>23</td>
<td>13 (56.5%)</td>
</tr>
<tr>
<td>Drugstore Users</td>
<td>134</td>
<td>22 (16.4%)</td>
</tr>
<tr>
<td>Users of Private M.D.s</td>
<td>113</td>
<td>19 (16.8%)</td>
</tr>
<tr>
<td>Users of Government Providers</td>
<td>520</td>
<td>84 (16.2%)</td>
</tr>
<tr>
<td>Ungrouped Cases</td>
<td>593</td>
<td>223 (37.6%)</td>
</tr>
</tbody>
</table>

Percent of "Grouped" Cases Correctly Classified: 39.2%.
Table 6.5. Classification Results for Discrimination Between Users of Non-Government and Government Family Planning Providers.

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>Predicted Group Membership</th>
<th>Users of Non-Government Providers</th>
<th>Users of Government Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Users of Non-Government Providers</td>
<td>278</td>
<td>180 (64.7%)</td>
<td>98 (35.3%)</td>
</tr>
<tr>
<td>Users of Government Providers</td>
<td>520</td>
<td>214 (41.2%)</td>
<td>306 (58.8%)</td>
</tr>
<tr>
<td>Ungrouped Cases</td>
<td>585</td>
<td>323 (55.2%)</td>
<td>262 (44.8%)</td>
</tr>
</tbody>
</table>

Percent of "Grouped" Cases Correctly Classified: 60.9%.
cases, representing possible new family planning acceptors are classified by our discriminant function as most similar to the private sector users. This is especially true of the four-group analysis where less than 20 percent of the ungrouped cases are classified with the users of government family planning services.

Tables 6.6 and 6.7 permit an in-depth analysis of the relative importance of each individual independent variable vis-a-vis the dependent variables for choice of a family planning provider. The three discriminant functions and their coefficients used for the four-group analysis were examined but not included. Interpretation of the different effects of the three functions proved quite complex, and the tenuous labeling of the functions in relation to the centroid positions of four different groups militated against including these coefficients in the present analysis. In general the first function had coefficients similar to those of the two-group analysis (Table 6.7), and the second appeared to have a "rural" interpretation related primarily to the choice of local/traditional providers and secondarily to government providers. The third function was not readily interpretable. The function coefficients and group centroids for this four-group discriminant analysis have been included in Appendix A.5.1 for reference purposes.

The general pattern for the independent variables associated with the type of provider used can be seen in Table 6.6. Overall, the gap variables appear strongest, followed by the potential user variables. The setting variables are next in importance with rural-urban variables
Table 6.6. Effectiveness of Variables in Discriminating Among Users of Different Types of Family Planning Providers.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Providers (4 Types)</th>
<th>Providers (0/1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
</tr>
<tr>
<td>User:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Marital Status</td>
<td>.62</td>
<td>-</td>
</tr>
<tr>
<td>Age of Wife</td>
<td>.77</td>
<td>-</td>
</tr>
<tr>
<td>Years Married</td>
<td>2.29*</td>
<td>2.40*</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>.49</td>
<td>-</td>
</tr>
<tr>
<td>Child Mortality</td>
<td>.48</td>
<td>-</td>
</tr>
<tr>
<td>Occ: Farmer</td>
<td>1.58</td>
<td>-</td>
</tr>
<tr>
<td>Occ: Government</td>
<td>.50</td>
<td>-</td>
</tr>
<tr>
<td>Occ: Informal Sector</td>
<td>.86</td>
<td>-</td>
</tr>
<tr>
<td>Education</td>
<td>2.13*</td>
<td>-</td>
</tr>
<tr>
<td>No Home Electricity</td>
<td>2.46*</td>
<td>2.39*</td>
</tr>
<tr>
<td>Read Newspaper</td>
<td>.47</td>
<td>-</td>
</tr>
<tr>
<td>Relatives in Home</td>
<td>.20</td>
<td>-</td>
</tr>
<tr>
<td>Native to Local Area</td>
<td>.28</td>
<td>-</td>
</tr>
<tr>
<td>Relative Land Holdings</td>
<td>1.01</td>
<td>-</td>
</tr>
<tr>
<td>Land Owned</td>
<td>.66</td>
<td>-</td>
</tr>
<tr>
<td>Trips to Market</td>
<td>.98</td>
<td>-</td>
</tr>
<tr>
<td>Trips to Bangkok</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Entry into H. System</td>
<td>8.26****</td>
<td>6.60****</td>
</tr>
<tr>
<td>Satisfaction w/H. System</td>
<td>.82</td>
<td>-</td>
</tr>
<tr>
<td>Provider:</td>
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<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>.45</td>
<td>-</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>.48</td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td>1.39</td>
<td>-</td>
</tr>
<tr>
<td>Type of Health Facility</td>
<td>2.35*</td>
<td>-</td>
</tr>
<tr>
<td>No. of Rooms</td>
<td>1.02</td>
<td>-</td>
</tr>
<tr>
<td>F.P. Important</td>
<td>1.03</td>
<td>-</td>
</tr>
<tr>
<td>T.E.C. Important</td>
<td>1.07</td>
<td>-</td>
</tr>
<tr>
<td>H.F. in a Market</td>
<td>1.47</td>
<td>-</td>
</tr>
<tr>
<td>H.F. in Usual Market</td>
<td>3.26**</td>
<td>2.72**</td>
</tr>
<tr>
<td>Gap:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Age</td>
<td>.19</td>
<td>-</td>
</tr>
<tr>
<td>Gap: Children-Ever-Born</td>
<td>.90</td>
<td>-</td>
</tr>
<tr>
<td>Gap: Education</td>
<td>1.75</td>
<td>-</td>
</tr>
<tr>
<td>Gap: F.P. Practice</td>
<td>.53</td>
<td>-</td>
</tr>
<tr>
<td>Gap: F.P. Method</td>
<td>2.98**</td>
<td>3.45**</td>
</tr>
<tr>
<td>Alt: Contiguous townships w/H.F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alt: Private Sector Use</td>
<td>4.85***</td>
<td>4.10***</td>
</tr>
<tr>
<td>Alt: Dist. to Drugstore</td>
<td>.45</td>
<td>-</td>
</tr>
<tr>
<td>Alt: Distance to M.D.</td>
<td>3.58**</td>
<td>3.45**</td>
</tr>
<tr>
<td>Distance to Govt. H.F.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 6.6 (Continued)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Providers (4 Types)</th>
<th>Providers (0/1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
</tr>
<tr>
<td>No. of Mills</td>
<td>3.92***</td>
<td>-</td>
</tr>
<tr>
<td>Transport Routes</td>
<td>1.59</td>
<td>-</td>
</tr>
<tr>
<td>Field Crops</td>
<td>.66</td>
<td>-</td>
</tr>
<tr>
<td>Rural Market Location</td>
<td>5.55****</td>
<td>4.34***</td>
</tr>
<tr>
<td>Local Disparities</td>
<td>1.32</td>
<td>-</td>
</tr>
<tr>
<td>Rural-Urban</td>
<td>2.98**</td>
<td>-</td>
</tr>
</tbody>
</table>

Overall F-Statistic 2.740 6.759

<table>
<thead>
<tr>
<th>Final X²</th>
<th>Function 1</th>
<th>2</th>
<th>3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>98.98</td>
<td>43.79</td>
<td>19.73</td>
<td>57.97</td>
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<tr>
<td>Eigenvalues</td>
<td>.090</td>
<td>.038</td>
<td>.031</td>
<td>.115</td>
</tr>
<tr>
<td>Canonical Correlation</td>
<td>.29</td>
<td>.19</td>
<td>.17</td>
<td>.32</td>
</tr>
<tr>
<td>Final Wilks Lambda</td>
<td>.857</td>
<td></td>
<td></td>
<td>.897</td>
</tr>
<tr>
<td>% Correctly Classified</td>
<td>39.2%</td>
<td></td>
<td></td>
<td>60.9%</td>
</tr>
<tr>
<td>Sample N</td>
<td>647</td>
<td></td>
<td></td>
<td>541</td>
</tr>
</tbody>
</table>

* = .10 level of significance
** = .05 level of significance
*** = .01 level of significance
**** = .001 level of significance

- Insufficient F Ratio (½ .10 level of significance) to enter final equation.

aAbbreviations listed in Appendix A.1.
Table 6.7. Means and Standardized Discriminant Function Coefficients for Uses of Different Types of Family Planning Providers.\(^a\)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Providers (4 Types)</th>
<th>Providers (0/1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USER:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Marital Status</td>
<td>1.00</td>
<td>.991</td>
</tr>
<tr>
<td>Age of Wife</td>
<td>38.11</td>
<td>36.56</td>
</tr>
<tr>
<td>Years Married</td>
<td>19.67</td>
<td>15.09</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>4.78</td>
<td>4.76</td>
</tr>
<tr>
<td>Child Mortality</td>
<td>.611</td>
<td>.566</td>
</tr>
<tr>
<td>Occ: Farmer</td>
<td>.833</td>
<td>.849</td>
</tr>
<tr>
<td>Occ: Government</td>
<td>.00</td>
<td>.019</td>
</tr>
<tr>
<td>Occ: Informal Sector</td>
<td>.111</td>
<td>.142</td>
</tr>
<tr>
<td>Education</td>
<td>2.67</td>
<td>2.96</td>
</tr>
<tr>
<td>No Home Electricity</td>
<td>1.83</td>
<td>1.71</td>
</tr>
<tr>
<td>Read Newspaper</td>
<td>6.50</td>
<td>6.77</td>
</tr>
<tr>
<td>Relatives in Home</td>
<td>.833</td>
<td>.745</td>
</tr>
<tr>
<td>Native to Local Area</td>
<td>.715</td>
<td>.741</td>
</tr>
<tr>
<td>Relative Land Holdings</td>
<td>1.05</td>
<td>1.02</td>
</tr>
<tr>
<td>Land Owned</td>
<td>28.67</td>
<td>19.92</td>
</tr>
<tr>
<td>Trips to Market</td>
<td>5.17</td>
<td>5.42</td>
</tr>
<tr>
<td>Satisfaction w/H. System</td>
<td>2.06</td>
<td>2.32</td>
</tr>
<tr>
<td></td>
<td>.500</td>
<td>.387</td>
</tr>
</tbody>
</table>

| **PROVIDER:**                       |         |            |          |            |               |            |                |
| Marital Status                      | .889    | .830       | .868     | .826       | .866           | .812       |                |
| Children-Ever-Born                  | 1.17    | 1.69       | 1.53     | 1.67       | 1.64           | 1.65       |                |
| Age                                 | 29.11   | 32.26      | 33.11    | 31.96      | 32.54          | 31.96      |                |
| Type of Health Facility             | 3.89    | 3.63       | 3.64     | 3.78       | 3.87           | 3.94       |                |
| No. of Rooms                        | 3.39    | 4.31       | 4.22     | 4.08       | 3.67           | 3.57       |                |
| P.P. Important                      | .778    | .594       | .659     | .664       | .676           | .677       |                |
| I.E.C. Important                    | .778    | .783       | .813     | .734       | .754           | .685       |                |
| H.F. in a Market                    | .444    | .528       | .648     | .590       | .536           | .580       | +.30            |
| H.F. in Usual Market                | .167    | .198       | .385     | .294       | .246           | .289       |                |
Table 6.7 (Continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GAP:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gap: Children-Ever-Born</td>
<td>3.72</td>
<td>3.64</td>
<td>3.11</td>
<td>3.34</td>
<td>3.38</td>
<td>3.32</td>
<td></td>
</tr>
<tr>
<td>Gap: Education</td>
<td>2.28</td>
<td>2.03</td>
<td>1.98</td>
<td>2.11</td>
<td>2.03</td>
<td>2.13</td>
<td></td>
</tr>
<tr>
<td>Gap: F.P. Practice</td>
<td>.611</td>
<td>.547</td>
<td>.495</td>
<td>.560</td>
<td>.559</td>
<td>.577</td>
<td></td>
</tr>
<tr>
<td>Gap: F.P. Method</td>
<td>.056</td>
<td>.151</td>
<td>.044</td>
<td>.153</td>
<td>.112</td>
<td>.169</td>
<td></td>
</tr>
<tr>
<td>Alt: Contiguous townships w/H.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.658</td>
<td>.682</td>
<td>.677</td>
<td>.749</td>
<td>.660</td>
<td>.737</td>
<td>+.42</td>
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<tr>
<td>Alt: Private Sector Use</td>
<td>.611</td>
<td>.415</td>
<td>.560</td>
<td>.370</td>
<td>.480</td>
<td>.359</td>
<td>-.25</td>
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<tr>
<td>Alt: Dist. to Drugstore</td>
<td>.889</td>
<td>.708</td>
<td>.582</td>
<td>.708</td>
<td>.653</td>
<td>.660</td>
<td></td>
</tr>
<tr>
<td>Alt: Distance to M.D.</td>
<td>32.00</td>
<td>20.87</td>
<td>19.19</td>
<td>18.63</td>
<td>23.67</td>
<td>20.14</td>
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<td>Dist. to Closest H.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.05</td>
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<td><strong>SETTING:</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>No. of Mills</td>
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<td>1.34</td>
<td>1.30</td>
<td>1.17</td>
<td>1.30</td>
<td>1.15</td>
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<tr>
<td>Transport Routes</td>
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<td>2.71</td>
<td>2.84</td>
<td>3.03</td>
<td>2.96</td>
<td>3.23</td>
<td>+.30</td>
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<tr>
<td>Field Crops</td>
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<td>.549</td>
<td>.564</td>
<td>.553</td>
<td>.552</td>
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<td>Rural Market Location</td>
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<td>3.81</td>
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<td>+.32</td>
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<td>1.79</td>
<td>1.76</td>
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<td>1.75</td>
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<td>3.64</td>
<td>3.81</td>
<td>3.78</td>
<td>3.83</td>
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</tr>
</tbody>
</table>

*aAbbreviations listed in Appendix A.1.*
making an impact. Lastly, the provider variables show some importance in their relationship with choice of a family planning provider, but overall, as before, the least important of the four components of the family planning transaction model. Let us now examine these patterns in more detail.

The Potential User Variables

Six variables for the potential user component have significant univariate or final F ratios. Of all the demographic variables, which were so important in our discriminant analyses for non-use/use of family planning, only one has significance in the choice of a family planning provider. The number of years the respondent was married entered the four-group equation at a .10 level of significance. This was mainly because users of local/traditional sources of family planning tended to be married for a longer time (and older).

Three social characteristics of the potential user were significant as well. Education had slightly significant univariate F ratios, while employment in the informal sector and home electricity showed up as more important. Means for these variables indicate people without home electricity (no electricity = 2) and employed in informal, or non-institutionalized jobs (informal occupation = 1) are more likely to use the government provider for family planning. Those without home electricity also tend to use the local/traditional sources of family planning, as both are associated with the rural, more remote areas. People employed in the informal sector tend toward using private M.D.'s
as well as the government family planning providers, though they tend not to use drugstores. These two variables suggest lower socio-economic status and, to a lesser extent, lower income: this substantiates the claim that the government services are often the choice of the poor. Often they have no choice: the government is the only source of family planning which can be free. This conclusion is also suggested by the smaller (though not significant) means on "land owned" and "relative land holdings" for users of government family planning providers.

Another significant potential user variable is "trips to market." The more mobile people tend to use drugstores and especially private doctors' clinics much more. This suggests that government facilities, especially in the rural areas, are being used by default. If the rural people were more mobile they would more likely use the private doctors' clinics or drugstores which are located in urban and market areas. A second interpretation could be that the more mobile people are also relatively better off financially and thus can avail themselves of the more expensive urban sources of family planning. There is truth in both contentions, although the first is more probable.

The last potential user variable to be discussed is the most statistically significant of the six. The importance of entry into the government health system for both the use of family planning, and more importantly, procurement at a government facility, has been consistently evident throughout all of the analyses. The distinct differences in group means in Table 6.7 substantiates the earlier discussion of this variable.
The Provider Variables

As for variables pertaining to the provider, only a few merit discussion. Very few have significant F ratios and there are no significant demographic variables. The government provider's type of facility (ordered from largest to smallest) has univariate but no final significance. The means show users of drugstores and private clinics more proximate to larger government facilities, and users of government family planning providers closer to the smaller, mostly second-class health centers. This seems logical enough, for the people who live in the larger urban areas tend to use private clinics and drugstores more as well as live most closely to a larger government health care/family planning facility.

The provider attitudinal variables are of little importance. The provider's emphasis on a need for Information, Education and Communication (IEC) is significant at a .10 level and is stressed more by those government family planning providers in areas where people tend to use the private sector more. This again hints at a "smokescreen effect" in that government family planning providers with poorer performances may be emphasizing IEC to cover up for their less than adequate work. The attitudinal variable for concern of the government provider over family planning aspects of his work was not significant and did not substantiate the significant relationship found with government workers' interest and family planning use in general reported earlier. Nevertheless, the means for just users of drugstores, private
clinics and government facilities bear out (though not significantly) the relationship of worker's interest and increased use of the government facility.

The last provider variables to be discussed are two connected with the location of the government family planning facility vis-a-vis the potential user. When a government facility is located in a potential user's usual market or any market, the potential user tended to go for family planning more to private M.D. clinics, second to government facilities, and third to drugstores.

The Gap Variables

The third set of variables, those pertaining to the gap, played an important role in discriminating between the users of different sources of family planning. Most important of the gap variables were not those representing a social or demographic gap between the local government provider and the potential user, but rather those variables which accounted for alternative providers (or intervening competition) to the local provider.

The only socio-demographic gap variable of significance was the "family planning method gap." This dummy variable was set at "1" if the local government provider and survey respondent used the same method. The means indicate that users of the government family planning services, as well as drugstores, more often use the same method as the local government provider. This variable, despite its "significance" and consistency with our gap theory with a smaller gap in this case
associated with more use of government family planning providers, does not contribute to the theory for two reasons. First, the percentage of cases with the same family planning method for both provider and user is quite small, and second, a smaller family planning gap relates to those types of providers who deal primarily in the most popular method, i.e., the smaller mean gap is related to use of pills which are predominantly distributed by drugstores and government family planning centers.

Further, we might expect that the family planning practice gap would be significant too, if the method gap was. The "family planning practice gap" means support the gap theory but are not statistically significant in this analysis.

The "alternative providers" variables are the most important of our gap component variables. The gap or distance between the potential user of the government family planning facility and the facility play an important role in use of government facilities. The more competition, be it from the private sector or possibly other nearby government family planning outlets, the less likely the local government provider will be used. Three variables representing alternative providers are telling in this respect. First, when there is a high density of government family planning facilities, i.e., almost one for each of the contiguous townships, usage of government facilities in general increases as expected: however, users further away from the township family planning facility in all likelihood may find a neighboring government facility more accessible or to their liking. Second, the perceived existence of major private sector family planning competition is associated with
marked decrease in use of government family planning facilities. Third, as the distance to the nearest medical doctor increases, people are more likely to turn to the private sector, especially the drugstores or local/traditional providers of family planning, to meet their needs. It should be noted here that medical doctors are connected to the government family planning delivery system, especially for those methods up the "medical gradient" such as sterilization. They can, however, represent the private "modern" doctors (our third group) when they work in their clinics early mornings and evenings. Both the public and private sector roles of medical doctors are borne out in the group means of the variable "distance to an M.D." which are lowest for these two groups.

Besides these three gap variables with noteworthy statistical significance, the failure of the variable "distance to the nearest drugstore" might be mentioned. It appears that this variable did not discriminate among users of different types of providers because drugstores in most cases were quite close to the local government family planning facility, and therefore there was little meaningful variability. The same lack of variability was true for the distance of the user to the nearest second class health/family planning center, a variable which did not accurately portray distance constraints to the nearest government facility for many of the respondents.
The Setting Variables

The last set of variables to be discussed are those for the setting component of the family planning transaction model. Three variables, the number of mills, the conditions of transport routes, and the ruralness (or size) of the market in which the government family planning facility is located, all show significant F ratios, though the number of mills (somewhat of an urban surrogate variable) does not enter into the final function because of its close negative correlation with the "rural market location" variable. The size of the market or urban area where the government health/family planning facility is located proved most important of the three setting variables.

The directional relationship of the variables as indicated by the group means is consistent with our hypotheses. Government family planning facilities are more likely used in places with fewer mills, poorer roads or less accessible waterways, and situated in a smaller urban marketplace. These findings have been also substantiated in an undisussed previous analysis (Appendix A.6.3) where a factor analytic dimension for the rural-urban setting was the most powerful discriminating variable in the choice of family planning provider. All these variables point out the importance of government family planning facilities in areas of poor accessibility and lend evidence to the contention that expansion of the national family planning delivery system to remote areas has indeed helped fulfill some of the latent demand for family planning services in the last decade.
During the course of this research several unforeseen, yet important unanswered questions emerged from the principal analyses. Probably most important was how the older women in the sample affected the results. In attempting to give an historical scope to the study and thus including all women who reported the possibility of using some form of family planning during their fecund years, important information from the younger, presently fecund cohort of women may have been missed. Therefore, by performing a discriminant analysis on use/non-use of family planning only for women less than forty years old, many of the effects of age in the analysis could be eliminated. Indeed, for both the analysis of current use and ever-use of family planning (Table 6.8) the effects of age and related demographic variables are greatly diminished. This stands in contrast to the earlier discriminant analysis of family planning use in which the demographic variables played the dominant role.

By partially controlling for the effects of age, other important variables which have been overshadowed by the dominating discriminating power of the demographic variables in the earlier analyses, emerge to discriminate between users and non-users of family planning. Also, controlling for age will allow a more exact analysis of the group of women who are the most important target population for the National
Table 6.8. Effectiveness of Variables in Discriminating Between Users and Non-Users of Family Planning, For Subsample of Women Less than Forty Years Old. a

<table>
<thead>
<tr>
<th>Variables</th>
<th>Current Use</th>
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<th>Ever-Use</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Not</td>
<td>Currently Using</td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
</tr>
<tr>
<td></td>
<td>Means</td>
<td>Currently Using</td>
<td></td>
<td></td>
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<tr>
<td>User:</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Female Marital Status</td>
<td>.995</td>
<td>.994</td>
<td>.01</td>
<td>-</td>
</tr>
<tr>
<td>Age of Wife</td>
<td>31.62</td>
<td>31.99</td>
<td>.63</td>
<td>(+) 3.06*</td>
</tr>
<tr>
<td>Years Married</td>
<td>11.42</td>
<td>11.67</td>
<td>.25</td>
<td>-</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>3.91</td>
<td>3.63</td>
<td>2.52</td>
<td>-</td>
</tr>
<tr>
<td>Child Mortality</td>
<td>.567</td>
<td>.337</td>
<td>8.48***</td>
<td>(-) 10.86****</td>
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<td>Occ: Farmer</td>
<td>.811</td>
<td>.833</td>
<td>.41</td>
<td>-</td>
</tr>
<tr>
<td>Occ: Government</td>
<td>.015</td>
<td>.020</td>
<td>.14</td>
<td>-</td>
</tr>
<tr>
<td>Occ: Informal Sector</td>
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<td>.181</td>
<td>1.16</td>
<td>(-) 4.63**</td>
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<tr>
<td>Education</td>
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<td>4.68**</td>
<td>(-) 4.68**</td>
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<td>1.76</td>
<td>7.08***</td>
<td>-</td>
</tr>
<tr>
<td>Read Newspaper</td>
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<td>6.03</td>
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<td>Relatives in Home</td>
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<td>.787</td>
<td>.07</td>
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<td>Native to Local Area</td>
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<td>.716</td>
<td>4.19**</td>
<td>(-) 4.63**</td>
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<tr>
<td>Relative Land Holdings</td>
<td>.741</td>
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<td>1.17</td>
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<td>Land Owned</td>
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<td>18.92</td>
<td>3.33*</td>
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<td>Trips to Market</td>
<td>4.93</td>
<td>5.53</td>
<td>5.90**</td>
<td>(+) 5.45**</td>
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<td>Entry into H. System</td>
<td>2.36</td>
<td>2.69</td>
<td>11.16**** (+) 6.46**</td>
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<td>Satisfaction w/H. System</td>
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<td>.363</td>
<td>4.54**</td>
<td>(-) 3.17*</td>
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<td>-</td>
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<td>Age</td>
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<td>-</td>
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<td>3.76</td>
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<td>4.04</td>
<td>.05</td>
<td>-</td>
</tr>
<tr>
<td>F.P. Important</td>
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<td>.674</td>
<td>11.25**** (+) 17.94****</td>
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<td>.14</td>
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<td>-------------</td>
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<td></td>
<td>Not</td>
<td>Currently</td>
<td>Currently</td>
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<td>Using</td>
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</tr>
<tr>
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<td>2.64</td>
<td>2.49</td>
<td>-</td>
</tr>
<tr>
<td>Gap: Education</td>
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<td>2.01</td>
<td>5.63**</td>
<td>(-) 4.70**</td>
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<tr>
<td>Gap: F.P. Practice</td>
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<td>.547</td>
<td>.11</td>
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<td>Alt: Contiguous townships</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>w/H.F.</td>
<td>.684</td>
<td>.723</td>
<td>2.88*</td>
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</tr>
<tr>
<td>Alt: Private Sector Use</td>
<td>.434</td>
<td>.419</td>
<td>.11</td>
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<tr>
<td>Alt: Dist. to Drugstore</td>
<td>.714</td>
<td>.751</td>
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<td>-</td>
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<tr>
<td>Alt: Distance to M.D.</td>
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<td>20.25</td>
<td>.02</td>
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<tr>
<td>Distance to Closest H.F.</td>
<td>1.89</td>
<td>1.93</td>
<td>.25</td>
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<td>SETTING:</td>
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<tr>
<td>No. of Mills</td>
<td>1.18</td>
<td>1.21</td>
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<td>Transport Routes</td>
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<td>Field Crops</td>
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<tr>
<td>Final $X^2$</td>
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<td>61.45</td>
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<td>.120</td>
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<tr>
<td>Canonical Correlation</td>
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<td>.327</td>
<td></td>
<td></td>
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<tr>
<td>Final Wilkes Lambda</td>
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<td>.893</td>
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<td>% Correctly Classified</td>
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<td>63.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample N</td>
<td>549</td>
<td>549</td>
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<td></td>
</tr>
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</table>

* = .10 level of significance  
** = .05 level of significance  
*** = .01 level of significance  
**** = .001 level of significance  

- Insufficient F Ratio (> .10 level of significance) to enter final equation.

*Abbreviations listed in Appendix A.1.*

*bSigns (taken from discriminant coefficients) denote the direction of the relationship with family planning use.*
Family Planning Program, the younger eligible women who are either currently using or not currently using family planning.

Table 6.8 shows the important discriminating variables and the direction of their relationship with the dependent variables. Overall, family planning users can be grouped most effectively from non-users by the "potential user" variables. The provider and gap component variables have some power and the setting even less, with no setting variables entering the final equation. It is somewhat surprising and quite noteworthy that the potential user variables have so much discriminating power even after reducing the effects of the associated demographic variables. Note that eight out of the ten entering variables in the discriminant function for current use are potential user variables.

The Potential User Variables

The important discriminating potential user variables merit some discussion. Child mortality is the only major demographic variable influencing the analysis. Its effects are sharpened from the previous analysis, its means showing non-users to have markedly higher incidence of child mortality. Limiting the age of women in this analysis has eliminated much of the statistical noise associated with older women with older children who have died, thus giving us a truer index of child mortality. Besides this demographic variable, the two health attitudes variables show up important as before in our analysis. Entry into the health system is associated with family planning use, and
dissatisfaction with the local government health facility once again (and somewhat perversely) shows a distinct association with family planning users.

Besides these demographic and health attitude variables, a whole host of socio-economic variables shows up as important. The two education variables show up as significant in the expected manner: the more educated tending to be more likely to use family planning. Home electricity is also associated with family planning use. Family planning users also are more mobile, as seen in the "trips to market" variable. This finding is substantiated by a variable which to this point in the analyses had never been significant: people "native to the local area" who tend to use family planning less. It appears family planning use is associated with people who have moved around more and are not so likely to be native to the area. One less significant variable, land owned, has mean values which suggest that people with more land (and by implication greater rural wealth) tend to more likely be current users of family planning.

Other Variables

Besides the potential user variables there are a few other variables of significance. Whether or not the local government health worker considers family planning as important to his job is the most significant discriminator between family planning users and non-users. The availability of a "motivated" government family planning worker nearby appears to have an important effect on family planning use. This
may be ascribed to not only the government family planning worker's official work, but also his private practice and indirect influences as well. Also of importance was the gap variable for the percentage of contiguous townships with health facilities. The more complete the government health/family planning system, the more likely people use family planning, or alternatively, the government system is possibly more complete in those places where people use family planning more, the more urban areas. The former relationship appears the more likely of the two. One other gap variable was of some importance: the gap in education. Its significance is in addition to the effects of the pure education variable and thus is even more noteworthy, lending evidence that a greater educational gap between the potential user and provider is associated with less use of family planning.

The Independent Variables: Observations on Non-Significant Variables

In all of the preceding analyses the significant independent variables were discussed in terms of their relationship to the dependent variables and the conceptual model. However, several variables which were hypothesized to be of importance but contributed little to the analytical model were not mentioned. In this section of the chapter, these variables are examined as well.

For variables connected to the potential user, occupational variables singularly displayed poor explanatory power. Of the three
dummy variables for important occupations, only informal sector work ever showed up as significant. Both farming and government work (which includes civil servants, teachers, etc.) had no discriminating power. This is somewhat unexpected in the case of government workers since they have free access to government health care facilities and disproportionately use them for medical needs. It is curious that this same behavior is not borne out for family planning. Why farmers do not tend toward any particular type of family planning behavior is also questionable in that several urban-rural surrogates showed up in analyses as significant. Possibly the dummy variable is just too vague, i.e., both the "fuzzy" group of "non-farmers" as well as farmers have few behavioral patterns in common. The variable for double-crop rice farmers showed no relation to the dependent variables as well. This variable was hypothesized to be of importance to the farm lifestyle in terms of time spent in the fields and yearly income. This variable may well be an important descriptor of the rural farm situation; however, it appears, at least in this study, to show no relationship to family planning behavior.

A final potential user variable of little significance was trips to Bangkok in the last five years. This variable was nowhere as effective as trips to the market in the last month in representing mobility. It appears that short-term, shorter distance travel to an urban area is more important than a longer-term approximately 150 kilometer trip to the primate city in terms of characterizing peoples of distinctive mobility and family planning behavior.
Variables connected to the local government family planning provider fared quite poorly in terms of explanation for the study. Many characteristics for the provider and his facility were eliminated early in the study because they had no correlation with any of the dependent variables. Those included in the discriminant analyses, such as the age, children-ever-born, and marital status of the government family planning worker or the number of rooms or type of facility seldom, if ever, were significant. These types of characteristics were originally considered by the author to be of little importance despite the common opinion of public health/family planning workers to the contrary. What is interesting is the importance of the variables representing the attitudes of the worker and location of the facility. Another variable of some importance, "who made the original location decision for the local facility," unfortunately had to be eliminated from the discriminant analyses because of missing information, especially for the older facilities.

For the gap variables, two distance measures proved inadequate in offering any explanation of family planning behavior. Distance from the government family planning facility to the nearest drugstore had very little variability with almost 90% of the cases a drugstore being reported a kilometer or less away. What variation that existed was not meaningful. Possibly the question was misinterpreted, for it appeared a number of rural government facilities were more than a few kilometers from a second class drugstore. It is possible that a "drugstore" was any small shop selling some medicine. The second distance measure which
was not significant was the distance from the potential user to the nearest second class health center. A serious shortcoming of this variable was that it was meaningless for people with a larger and better government health facility nearby. This variable would be appropriate with a rural subsample only. While other distance variables proved more effective, for example, the distance to the family planning supplier used, they too unfortunately had to be eliminated from the analyses because of many cases with missing values. It should be noted that distance to the local health/family planning facility when previously cross-tabulated with family planning use shows a significant decrease in use with distance.

The "setting" variables representing the dominant crop of the township had poor explanatory power. The variable used in all the discriminant analyses was whether or not a field crop (mainly sugar cane) was dominant. This variable should have accurately portrayed the crop regime of most all townships, for if field crops were not dominant in all probability paddy rice would be. It appears that the variable, though making an important distinction in the agricultural setting, was just too general and not appropriate for characterizing the peoples' family planning behavior.

Chapter Summary

Chapter VI, the principal analytical chapter of this dissertation, starts by reviewing the empirical model and the two dependent variables
to be analyzed, family planning use and choice of a family planning provider. Interpretive aspects of the principal analytical method, discriminant analysis, were then discussed and the analyses followed on both dependent variables in their various forms. A final discriminant analysis tested a subsample of potential family planning users who were less than forty years old.

The results of the discriminant analyses allowed a reasonably clear interpretation of the conceptual model of this dissertation, the Family Planning Transaction Model. Although all four components of the model played a role in the family planning transaction, it was evident that characteristics of the potential user were most important and then variables representing the gap. Much less important was the setting and least important, characteristics of the local government provider and his facility. The potential user characteristics clearly dominated in discriminating between users and non-users of family planning, while both gap and potential user characteristics most heavily influenced the choice of a family planning provider.

Figure 6.2 summarizes the results of the discriminant analyses of use/non-use of family planning (including the analysis from Appendix A.6.3 with factor analytic variables) in more detail. The strength of the potential user component derives principally from demographic characteristics and secondarily from health attitudes, mobility and socio-economic characteristics. The demographic variables such as the age of wife, children-ever-born, years married and child mortality, are closely interrelated with a syndrome of the older women with higher
<table>
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<tr>
<th>Analysis with Factor Dimensions</th>
<th>Analysis with Individual Variables</th>
<th>Analysis with Individual Variables &amp; Women &lt; 40 Years</th>
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<tr>
<td>1. POTENTIAL USER</td>
<td>1. POTENTIAL USER</td>
<td>1. POTENTIAL USER</td>
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<td>-FD: Demographic (-)</td>
<td>-Female Marital Status (+)</td>
<td>-Age of Wife (+)</td>
</tr>
<tr>
<td>-FD: SES (+)</td>
<td>-Age of Wife (-)</td>
<td>-Child Mortality (-)</td>
</tr>
<tr>
<td>-FD: Rural Lands</td>
<td>-Years Married (-)</td>
<td>-Occ: Informal Sector (-)</td>
</tr>
<tr>
<td>-FD: Family Type (+)</td>
<td>-Children-Ever-Born (-)</td>
<td>-Education (+)</td>
</tr>
<tr>
<td>-Entry into Health System (+)</td>
<td>-Child Mortality (-)</td>
<td>-No Home Electricity (-)</td>
</tr>
<tr>
<td>-Trips to Market (+)</td>
<td>-Occ: Farmer</td>
<td>-Read Newspaper (+)</td>
</tr>
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<td>-Trips to Bangkok (+)</td>
<td>-Occ: Informal Sector</td>
<td>-Native to Local Area (-)</td>
</tr>
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<td>2. GAP</td>
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</tr>
<tr>
<td>-FD: Dist. to Competition</td>
<td>-Gap: Age (-)</td>
<td>-Gap: Education (-)</td>
</tr>
<tr>
<td>-FD: Socio-Demographic Gap (-)</td>
<td>-Relatives in Home (-)</td>
<td>-Contiguous Townships with Health Facilities (+)</td>
</tr>
<tr>
<td>-FD: Family Planning Gap (-)</td>
<td>-Native to Local Area</td>
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<td>3. PROVIDER</td>
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<td>3. PROVIDER</td>
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<tr>
<td>-FD: Size of Facility (-)</td>
<td>-Relative Land Holdings</td>
<td>-Family Planning Important (+)</td>
</tr>
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<td>-FD: Demographic (-)</td>
<td>-Land Owned</td>
<td>-Type of Facility (+)</td>
</tr>
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<td>2. GAP</td>
<td>4. SETTING</td>
</tr>
<tr>
<td>-Local Disparities (+)</td>
<td>-Trips to Market (+)</td>
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<td>-Entry into Health System (+)</td>
<td>-Transport Routes (-)</td>
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<td>-Satisfaction with H.S. (-)</td>
<td>-Field Crops</td>
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| Figure 6.2. Summary of Important Components and Significant Variables for the Family Planning Transaction: Discriminating Between Users and Non-Users.
parity not so likely to have ever used family planning. When age is partially controlled, by repeating the discriminant analyses with a subsample of women under forty years old, the importance of these demographic variables is greatly diminished and other potential user characteristics emerge as important discriminators. These socio-economic and other variables (seen on the right hand side of Figure 6.2) relate to family planning use in the expected and hypothesized way, for example, with the better educated, more mobile, and better off women tending more to use family planning.

The importance of the gap as well as the potential user variables in the choice of a family planning provider can be seen in the summary of important components and variables in Figure 6.3. The more important gap variables are those accounting for alternative providers, or competition for the local family planning center. The more isolated the government family planning center is relative to other private and public family planning suppliers, the more likely it is to be used. A wider social gap between the potential user and government provider also shows some effect on diminishing use of the local government family planning provider, though not as convincingly as the existence of competition. Also related to choice of provider, there are important potential user characteristics, for example, the more mobile and better off women tending to use private medical doctors. Users of the government family planning provider tend to be less educated, less mobile, and less well off, similar to users of local/traditional sources of family planning. Drugstore users appear to be a mix of people, some
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<td>-Contiguous Townships with Health Facility (+)</td>
<td>-Contiguous Townships with Health Facility (+)</td>
</tr>
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<td>-Private Sector Use (-)</td>
<td>-Private Sector Use (-)</td>
</tr>
<tr>
<td>-FD: Family Planning Gap (-)</td>
<td>-Distance to M.D. (-)</td>
<td>-Distance to M.D. (-)</td>
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<td><strong>2. POTENTIAL USER</strong></td>
<td><strong>2. POTENTIAL USER</strong></td>
</tr>
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<td>-Occ: Informal Sector (+)</td>
<td>-Education</td>
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<td>-Education</td>
<td>-Trips to Market (-)</td>
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<td>-Entry into H.S. (+)</td>
<td>-No Home Electricity (+)</td>
<td>-Entry into H.S. (+)</td>
</tr>
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<td><strong>3. SETTING</strong></td>
<td><strong>3. SETTING</strong></td>
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<td>-Entry into H.S. (+)</td>
<td>-Rural Market Location (+)</td>
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<td><strong>4. PROVIDER</strong></td>
<td><strong>4. PROVIDER</strong></td>
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<td>-FD: Size of Facility (-)</td>
<td>-Type of Facility</td>
<td>-IEC Important (-)</td>
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<td>-Rural-Urban</td>
<td>-H.F. in a Market (+)</td>
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<td>-H.F. in Usual Market</td>
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*Detailed results in Appendix A.6.3.

**Unpublished discriminant analysis for three groups: government, private doctors and drugstores.

Figure 6.3. Summary of Important Components and Significant Variables for the Family Planning Transaction: Discriminating Among Users of Different Providers.
from the urban area, and others coming in from the rural areas. The
statistics for these two types of people may be averaging out together
and leaving us with not very distinctive mean values for drugstore
users. Controlling for age in an unreported analysis of provider choice
did little to affect our results, suggesting that the criteria for
decisions over what provider to go to have not changed dramatically over
time (or through the generations).

Whether the setting was rural or urban closely affected the
analysis of provider choice but not family planning use. This appears
opposite to what one might intuitively think or what the family planning
literature suggests. Urban areas are traditionally associated with
lower fertility and rural areas with higher fertility. (e.g., in
Thailand: Prasithrathsin, 1971; Goldstein, 1972). Why this pattern
does not strongly evidence itself with marked higher prevalence of
family planning in this study's data for urban areas is uncertain.
Possibly the characteristics of the urban population in the very rural
survey province (Suphanburi) are not that different from the general
population. In provincial Thailand Sermari (1980) found that a regular
relationship of larger urban areas with lower fertility does not appear
to hold. It appears in the study that the ruralness of the location of
the government family planning facility is more important than the
potential user's place of residence in discriminating where people go
for family planning service. The rural-urban relationship to family
planning behavior is obviously a bit more complex than researchers
sometimes have interpreted it. In an unreported analysis, a factor
dimension accounting for several aspects of ruralness was a very powerful discriminator for the choice of a provider. Likewise, in the present analysis, the more rural market locations for government family planning facilities are used more by the local peoples, possibly due to a lack of viable alternative providers, either public or private. If the government facility was in any market, especially the respondent's usual market, it was more likely used, but also private medical doctors in that market location were even more likely to be used.

The importance of the attitudes of both the provider and potential user of family planning also are of note. That the government family planning provider views family planning as a major part of his work is closely related to family planning use in the community. Somewhat oddly though, it is not significantly related to the use of the government providers specifically. Possibly the government provider's attitude has indirect effects encouraging use from private suppliers, possibly the government worker himself in his off-hours private clinic. The attitudes of the local people were important as well. Interestingly, people more critical of (or possibly "more concerned" with) the local health facility were also more likely users of it. Further "entry into the health system" was a strong discriminating variable throughout all analyses, emphasizing the importance of people's acquaintance with the general public health system to their using it for family planning.

Overall, the empirical test of the Family Planning Transaction Model demonstrated some importance of each component of the model but a dominance of the potential user characteristics and a secondary
importance of gap characteristics. Potential user characteristics, especially demographic variables, were particularly important in classifying family planning use. When the effects of older women were controlled, socio-economic variables, for example, those associated with higher education and mobility became important. Also of note were the attitudes and past behavior of the potential user towards the government family planning system. The gap in the compared characteristics of the provider and potential user also showed some independent discriminating power, thus giving some (though weak) support to the homophily-heterophily hypothesis of Rogers (1973). Finally, family planning use was slightly affected by the setting and provider, in particular, the perceived extent of the government health provider's role in family planning.

Relevant to the decision to use a government or private sector family planning provider, gap variables, especially the existence of alternative providers were most important. Second in importance were the potential user characteristics. Besides these two components, there was a strong association of the rural setting with government family planning provider use. The effects of the provider and his characteristics were small. Given these conclusions particular to the empirical model the next, and final chapter summarizes the study and then draws implications for family planning in general, the two conceptual models and policy decisions of the Thai government.
CHAPTER VII
SUMMARY AND CONCLUSIONS

General Summary

This dissertation examines the utilization of family planning in a Third World context. To approach such a study, two conceptual models were devised. The first, a macro-level model, the General Model of Diffusion of Family Planning, delineated six major aspects of family planning, drawing on the most recent perspective of innovation diffusion (Brown, 1981). This model places the large and fragmented family planning literature in a framework encompassing: 1) the technological development of birth control methods (the innovation), 2) the social setting in which change in family planning behavior occurs, 3) the entity providing the ideas and methods of family planning (a government or private propagator), 4) the delivery strategies of the propagator's agencies, 5) the acceptance or non-acceptance of family planning by the potential user (the adoption process), and 6) changes in each of the above as a result of the adoption of family planning.
Elaborating on the interaction between the family planning propagator, its strategies and the consequent adoption process (items 3, 4, and 5 in the macro-model), a second conceptual model focuses on the utilization of family planning and the choice of a particular provider. This micro-level model, the Family Planning Transaction Model, emphasizes the role of four major components in the utilization of family planning: 1) characteristics of the potential user (the demand site), 2) characteristics of the provider (the supply side), 3) the "gap" between the potential user and provider, for example, social and physical distance, and 4) the socioeconomic setting in which the family planning transaction takes place. These two models are the subject of Chapter III.

The Family Planning Transaction Model was tested in the empirical analysis of the dissertation. Specifically, variables representing important aspects of each of the four components were drawn from survey data of both potential users and government providers in Suphanburi Province in 1977. The data collection procedures and the rationale underlying the choice of variables are detailed in Chapter V. The data was designed to address two principal questions: 1) how can people who use or do not use family planning be distinguished apart, and 2) how can users of the public sector be distinguished from users of the private sector. These two sequential and closely related questions of the family planning transaction were examined through discriminant analysis in Chapter VI.
General Contributions to Family Planning

Several general contributions to the study of family planning come from this study. First, the two conceptual models introduce a broadened framework and perspective for family planning: the macro-model, allowing the literature and research work in family planning to be drawn together in a comprehensive and logically inclusive manner, and the micro-model, highlighting the important factors (termed components) in the individual-level decision to use family planning and to choose a public or private sector provider. The empirical test showed the viability of this second, behavioral model.

A further contribution was in testing several variables new to family planning utilization research. In particular, the model examined several variables relating to the agricultural lifestyle, found usually only in studies from rural sociology or agricultural economics, as well as several geographic variables relating to, for example, location, geographical mobility and distance. In addition, the "gap" or "distance" concept of the Family Planning Transaction Model introduced several new variables, some accounting for alternative providers and others which measured the extent of differences in social and economic characteristics (the compared characteristics) between the potential user and the nearby government provider.

The inclusion of several of these less frequently used variables (in studies of family planning utilization) is at least in part due to the geographic emphasis of the study. Besides the inherently geographic
variables (e.g., location, mobility, etc.), two of the components of the Family Planning Transaction Model are geographically oriented: the gap, dealing with social distance, barriers and the like, and the setting, the overall context geographers frequently consider in spatial distribution (or ecological) studies. This dissertation (as far as the author is aware) is the first comprehensive study of family planning to date by a geographer.

In addition, further contributions of this study are the detailed reviews of family planning distribution strategies in the Third World (Chapter II and Appendix B.1), and specifically, Thailand (Chapter IV). Both of these are among the most comprehensive ever undertaken. Lastly, several "real world" policy recommendations relevant to national family planning programs in the Third World may be drawn from the case study of Thailand, with its large national program and in light of its recent and very rapid fertility decline. These policy implications will be suggested in this chapter after a reiteration of the major empirical findings of the study.

The Major Findings

The research findings suggest some importance of each of four components of the Family Planning Transaction Model, and thus provide support for the structure of our conceptual model. Overall, however, characteristics of the potential user are most important in the analyses, followed by the gap variables. Of much less importance are
the setting and characteristics of the local government provider and his facility. Specifically, in discriminating between users and non-users of family planning, potential user variables are dominant, while the gap and potential user components have the most marked influence in the choice of a public or private family planning provider.

Findings on Family Planning Use

The influence of the potential user component in the use of family planning is mainly due to several interrelated demographic statistics and secondly, health attitudes and behavior. The demographic variables show a syndrome of older women with higher parity not so likely to have used family planning. Interestingly, if the older women (those more than 39 years) are removed from the analysis, the strong demographic effects almost disappear, thus providing evidence of the recent revolution in contraceptive use occurring in Thailand over the last two decades. With the analysis of younger women, socio-economic (potential user) variables become more important in the hypothesized fashion: with the more mobile, better educated and better off women more likely using family planning. With or without controlling for age, the two health behavior variables also remain important. The variable recording the number of different types of government health facilities ever-used, "entry into the health system," was consistently and strongly associated with both use of family planning and the choice of a government provider. Though partially tautological, this variable reaffirms the importance of "first entry" previously documented in the medical care
utilization literature. A further health behavior variable, "satisfaction with the health system," suggests the importance of people's attitudes.

Other variables were important to the use of family planning as well. The existence of a government health worker who stated family planning was one of his chief duties had a highly significant positive association with family planning use, though, somewhat curiously, not with use of the government family planning facility. This possibly could be attributed to the indirect effects of the government family planning worker, especially through his own private clinic or drugstore. Lastly, several social gaps between the provider and the potential user were significant in the use of family planning, though these variables were again expected to be related to the choice of a specific provider, which they were only slightly. Given this, such variables only weakly support the homophily-heterophily hypothesis of Rogers (1973).

Findings on Provider Choice

In the analysis of provider choice the gap component was of greatest importance, followed by the potential user component and some rural-urban characteristics of the setting. Most important of the gap variables were three variables accounting for alternative providers (or intervening competition). Clearly, the existence of private and other public facilities nearby was affecting the utilization patterns of the local government family planning facility.
The potential user characteristics point out interesting "market segments" associated with different family planning providers. More mobile and better-off women tend to use private medical doctors, while the less well-off tend to use the government family planning provider or the local/traditional sources of family planning. Drugstore users appear to be a mix of people, some from the city, others from the rural areas.

Finally, the rural setting was closely associated with government provider use but not family planning use per se. This latter finding is somewhat surprising given the past documentation of lower fertility in urban areas. It appears possible that this differential has been erased in the predominantly rural province of Suphanburi. However, of greater interest to this study is the association of the more rural areas with greater use of government, relative to private, providers.

Implications for the Family Planning Literature

These empirical findings from the test of the Family Planning Transaction Model have several implications relevant to the past work in family planning. The overall importance of the potential user variables may be viewed by some as justification of past research efforts which predominantly concentrated on characteristics of the acceptor or potential user population (e.g., KAP studies). However, many of these studies have lacked a comprehensive set of descriptive variables on the potential user himself. A simple description of selective
characteristics may not be sufficient. One point the present study made quite clear is that the interaction of different individual variables can drastically alter the interpretation of the potential user population: by filtering out the effects of the older cohorts of women, an almost entirely new set of significant variables emerged to describe family planning users.

Be this as it may, the present study demonstrates the need to focus on other components of the Family Planning Transaction as well. The past neglect in the literature on aspects of the provider should be reconsidered. Although characteristics of the provider and his facility showed up only weakly in the model, a few of these variables were important, for example, the government provider's attitude toward his family planning responsibilities. Also important were the location of the facility and "first entry" (previous use of the public health system), which may be interpreted as applicable to the provider but were not specifically listed as such. In addition, the gap variables, with such considerations as social distance between the provider and local people and the presence of alternative providers, were important and are related to the provider as well.

Variables representing the setting were not important, except for the notable and highly significant finding that the more rural the area the more likely people will use a government rather than a private family planning provider. In the analysis of family planning use for women less than forty years old, there were no setting variables of slightest importance. Possibly, these setting, or contextual, variables
were not adequately defined, but within the limits of this study, the
debate over whether "development" or "contraceptive accessibility"
discussed in Chapter II is the key to fertility decline (use of family
planning) definitely tilts toward the argument of accessibility.
Different settings are not affecting the level of family planning use
(and by extension, fertility) in Suphanburi Province, yet the existence
of government family planning facilities in remote areas appears to be
increasing the number of users, many of whom quite likely would not make
the trip to a private supplier. However, in that the people who use the
private sector more tend to be more mobile, it is difficult to determine
if the more isolated and less mobile people are using the government by
default or out of convenience.

Given the weaker overall importance of the setting and provider
components in the Family Planning Transaction, studies comparing the
relative importance of background factors vs. program factors (or
inputs) may indeed have left the most important set of factors, those
dealing with the potential user population, completely out of the
analytical design. The findings of the Suphanburi study give evidence
supporting the recent plea (Zeidenstein, 1980; The Population Council,
1981) for greater understanding of the "user perspective."

When the findings about the Family Planning Transaction Model are
viewed in a supply-demand context, the importance of both sides of the
family planning utilization process can be understood. The demand
considerations, relating to the potential users and their needs, are
suggested to be important by the relative significance of the potential
user component in the model. However, the supply side considerations, which have been relatively neglected in the literature, also deserve attention. Certain crucial supply side variables, such as the government family planning worker's attitudes, previous use of the public health system and facility location, were important in the empirical analysis as well as the gap variables, all of which can be changed by supply-side strategies.

Finally, if the findings of the empirical test of the Family Planning Transaction Model are related to the macro-model discussed in Chapter III, the General Model of Diffusion of Family Planning, several observations may be made. First, the analysis explicitly dealt at least with three of the factors of the model. Along similar lines of reasoning as the past discussion, the adoption context may be viewed as relatively more important, and the setting the least, except in relationship to diffusion agency establishment considerations. Specifically, the timing and location choice of newly established family planning facilities appears to be affecting when and where people adopt or use family planning. Lastly, different diffusion strategies such as those reviewed in Chapter II and Appendix B.1 were not explicitly dealt with, but are important in that they may be manipulated by the public sector to better meet (or create) demand.
Limitations of the Study

All of the above findings and conclusions must be couched in the limitations of this study. In general, the accuracy of the variables varied with the various components. The potential user variables were probably best defined. On the other hand, the decision to include the setting component came only after the survey and, therefore, the setting variables, although adequate, could have been more extensive and better defined. Information on the potential provider and gap variables was thoroughly collected, although in the end it did not appear to be effectively measuring all that was conceptually important about the two components.

Specifically, there appears the need to better approximate crucial variables pertaining to the providers' attitudes. Several questions in the Health Worker Survey probed at attitudes; however, it proved difficult to tease out much which reflected true attitudes. What is needed to be known are the family planning worker's attitudes toward the local people: Is he condescending towards them? What are his work habits: Is he really doing his job, or is he just marking time? A recent in-depth study of two township health centers in rural Thailand has demonstrated the profound difference a highly motivated, hard-working and tolerant midwife can have on the utilization of family planning (Rauyajin, et al., 1981). The need for this kind of data was evident to the author both before and during the survey, but how to measure it in the span of a short survey and informal discussion proved elusive.
Similarly, it proved difficult to get a handle on good gap variables: information that would effectively measure the socio-economic distance between the provider and the local people. Possibly, more psychological variables like modernity value orientations could be used to construct more appropriate gap variables. A further problem with the gap variables was inherent in their methodological design: individuals were compared with the government family planning worker in their township and there is no way to know for sure whether that was the (government) provider they were interacting with or not.

Overall, in this study the compared-characteristics gap variables failed to substantiate quantitatively what appeared from field observation in Thailand to be a tenable hypothesis.

A few specific statistical problems deserve mention as well. Already, Chapter VI discussed a few variables, for example, inequalities in the setting and some distance measures, which were not effective because they were improperly defined. A second consideration was that, although many variables and all the functions were statistically significant, the overall statistical "explanation" of the discriminant functions was low. This, however, is not uncommon in individual-level behavioral studies. Another problem was that the provider variables did not have as much variability as the potential user variables, the providers being a much more homogeneous group in general. This may have affected the performance of these two groups of variables. In addition, there was the statistical problem of multicollinearity, for example, with the demographic characteristics of potential users. This, however,
was shown to be less serious than originally imagined, for an analysis with factor analytic dimensions as independent variables reasonably replicated the present study. These specific statistical problems do not appear to have significantly altered the overall study findings. Nevertheless, problems of variable definition, as in many studies, may have.

Policy Implications for Thailand

While the general findings already discussed relate to Thailand, there are also several policy recommendations which may specifically be offered vis-à-vis the Thai National Family Planning Program. First, given the importance of the potential user variables, the program should design its strategies after careful consideration of the potential users' needs. Said another way, it appears more important to make family planning accessible or accommodating to the individual; this may be more important than effecting change in the setting, the overall socio-economic situation. Related to this is that it appears that the Thai government policy of promoting accessibility to family planning is a sound one. The findings connected to the rural-urban setting variables seem to indicate that siting new public health/family planning facilities in the most remote areas will promote new users of family planning. In that alternative providers, both private and public, are at least partially substitutable for a public sector facility, the more isolated, yet unserved, areas may be the best
opportunity for government effort on account of a lack of private competition. It should be noted anyway that the more urban centers already are served by the public and private sector. In that regard, there appears a need for closer investigation of the private delivery system and the "market segment" of the population that they have captured.

Government facility location policy (which has been somewhat similar to the above recommendations for the last few years), however, is working in opposition to the policy that has brought better roads to much of the rural areas. Rural facility locations encourage use of the public sector, but on the other hand, better roads, and hence better mobility, may lead people to make the trip to a private sector provider. The more mobile people tend more to use private providers, but, however, this does not necessarily imply that the more mobile people become, the more likely they will use a private provider. Certainly, they have a better opportunity to use the private sector, but a more definitive statement requires more in-depth research.

Lastly, a variable with a strong and positive relationship with family planning use, "entry into the health system," deserves mention. This variable, upon consideration towards the end of the study, appeared to closely reflect the provider, and not user, component, because it indicates past government performance in providing medical and public health service. Given that the experience with different facilities of the government health system more likely assures that a person will both use public sector family planning and choose a government provider,
effort should be made to encourage "first entry" into the system. Special campaigns, possibly approaches borrowed from marketing techniques (and suggested by the macro-model), may be effective ways to accomplish this.

A further important supply-side variable amenable to policy considerations is if "family planning [was] important" in regards to the job responsibilities of the local health worker. To change behavior, attitudes and motivations may indeed be difficult, but policy actions can be considered. We must avoid the situation where the hard-working and effective family planning worker is frustrated by a lack of rewards and comes into conflict with her superiors, while her much less effective counterpart fits in well with the official health hierarchy (Ranyajin, et al., 1981). A better system of performance rewards and promotions may help. Also, more emphasis can be put on the family planning aspects of the health worker's job, for example, through occasional retraining seminars (as the Ministry of Public Health has sometimes done in the past).

Conclusions and Future Research Directions

This study started with the problem of attempting to explain the differences in grassroots level family planning behavior in Thailand. To this end, the study suggested some answers, both on a conceptual and empirical basis.
There have been other ways in which to approach this problem. Indeed, if this project was to start anew, several new variables could be tried, for example, differences in delivery and communication strategies, psychological variables such as "modernity" indices, township levels of education, and distance measures which are applicable to the whole population. Other variables could be reclassified, such as the "entry into the health system" discussed above.

However, this project does not have the luxury of being reworked with new variables, and the implications of those tested appear to be nonetheless firm. Some components and individual variables may be considered almost universally important in the family planning transaction; others may be very culture-specific or country-specific. Which these variables are can only be shown through further research in more countries. It would also be insightful to replicate this research design on different geographic scales in Thailand: both nationwide and on the local level to see if the results are similar to our "meso-level" provincial study.

Nevertheless, emanating from this study, one conclusion does seem to remain clear: that the research work in family planning should yield findings more valuable and readily interpretable if couched in a framework that takes more than one of the components of the Family Planning Transaction Model into account.
BIBLIOGRAPHY


Nortman, Dorothy and John Bongaarts. 1975. Contraceptive Practice Required to Meet a Prescribed Crude Birth Rate Target: A Proposed Macro-model (TABRAP) and Hypothetical Illustrations. Demography 12(3):471-489.


Appendix A.1

List of Abbreviations Used in the Dissertation

alt. - alternative provider
ARD - Accelerated Rural Development
BMDP - Biomedical Computer Programs
cap. - capital
CBFPS - Community-Based Family Planning Services
F.P. - family planning
H.F. - health facility
H.S. - health system
IEC - Information, Education and Communication
IPPF - International Planned Parenthood Federation
IPSR - Institute for Population and Social Research, Mahidol University (Bangkok)
IUD - intrauterine device
KAP - Knowledge, Attitudes and Practice of Family Planning Surveys
NFPP - National Family Planning Program
occ. - occupation
PAA - Population Association of America
PPAT - Planned Parenthood Association of Thailand
SAS - Statistical Analysis Systems (computer programs)
SPSS - Statistical Package for the Social Sciences (computer programs)
USAID - United States Agency for International Development
WFS - World Fertility Survey

**Family Planning Source**

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Percentage</th>
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<tr>
<td>Changwat hospital</td>
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</tr>
<tr>
<td>Amphoe hospital</td>
<td>12.0</td>
</tr>
<tr>
<td>Health station</td>
<td>27.6</td>
</tr>
<tr>
<td>Tambon doctor</td>
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</tr>
<tr>
<td>Mobile clinic</td>
<td>0.2</td>
</tr>
<tr>
<td>Other &quot;government&quot;</td>
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</tr>
<tr>
<td>&quot;Government&quot; sub-total</td>
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<td>Private nurse</td>
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<td>Private (government) midwife</td>
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<tr>
<td>Private hospital in Bangkok</td>
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<td>Injection doctor</td>
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<td>Traditional doctor (&quot;maw boran&quot;)</td>
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<td>&quot;Traditional&quot; sub-total</td>
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n = 823
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<th>Amphoe Hospital</th>
<th>Health Station</th>
<th>Tambon Doctor</th>
<th>Mobile Clinic</th>
<th>Private Medical Doctor</th>
<th>Private Hospital</th>
<th>Private Clinic</th>
<th>Practitioner &quot;maw&quot;</th>
<th>Injection Doctor</th>
<th>Drugstore</th>
<th>Small Shop Which Sells Drugs</th>
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<td>-</td>
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<td>100.0</td>
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<td>IUD</td>
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<td>-</td>
<td></td>
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<td>9.3</td>
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<td>-</td>
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<td>40.0</td>
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<td>-</td>
<td></td>
<td>12.6</td>
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<td>1.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.5</td>
<td>-</td>
<td>3.1</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>58.1</td>
<td>46.8</td>
<td>23.0</td>
<td>2.2</td>
<td>-</td>
<td>25.3</td>
<td>60.0</td>
<td>27.6</td>
<td>-</td>
<td>0.8</td>
<td>-</td>
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<tr>
<td>Male Sterilization</td>
<td>20.9</td>
<td>29.1</td>
<td>9.1</td>
<td>0.4</td>
<td>28.6</td>
<td>50.0</td>
<td>46.8</td>
<td>20.0</td>
<td>44.8</td>
<td>30.0</td>
<td>69.2</td>
<td>0.8</td>
<td></td>
<td>29.2</td>
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<td>Others</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
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<td>-</td>
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<td>13</td>
<td>131</td>
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</tr>
</tbody>
</table>
Appendix A.5.1 Detailed Definitions of Transformed Variables (Those starred in Table 5.2)

1. Occupation: Informal Sector - Includes vendor, small shop owner, housekeeper, driver, janitor, injection doctor, unskilled (usually self-employed) labor, construction worker, cottage industry worker, repairman

2. Trips to Market -
   - once (etc.)
   - sometimes
   - 6 times
   - Everyday, quite often
   - Live in market

3. Number of mills -
   - no mills
   - at least 1 rice mill
   - 1 major (other) mill
   - 2 major mills
   - 3 major mills

4. (Poor) Transport Routes
   - Highways; good highway; roads good
   - Roads O.K.; average paved road
   - Waterway with good location and connections
   - Dirt roads: O.K., main roads
   - Dirt roads: fair
   - Waterway: somewhat out of the way
   - Dirt roads: Not good; bad; poor

5. Type of Closest Health Facility
   - Respondent does not know the type
   - Midwifery Center
   - Second Class Health Center
   - Medical and Health Center
   - District Hospital
   - Provincial Hospital
6. Rural Market Location - Ruralness of market type/size of urban area in which the local health facility is located.

<table>
<thead>
<tr>
<th>Market Type</th>
<th>Code</th>
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<tbody>
<tr>
<td>Provincial market</td>
<td>1</td>
</tr>
<tr>
<td>District market</td>
<td>2</td>
</tr>
<tr>
<td>Peri-urban (&quot;sukabiban&quot;) market</td>
<td>3</td>
</tr>
<tr>
<td>Township (&quot;tambon&quot;) market</td>
<td>4</td>
</tr>
<tr>
<td>No market nearby</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix A.6.1. Standardized Discriminant Function Coefficients for Users of Four Different Types of Family Planning Providers

<table>
<thead>
<tr>
<th></th>
<th>Function 1</th>
<th>Function 2</th>
<th>Function 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years Married</td>
<td>.19</td>
<td>.48</td>
<td>-.09</td>
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<tr>
<td>No Home Electricity</td>
<td>-.31</td>
<td>.30</td>
<td>-.18</td>
</tr>
<tr>
<td>User Literature</td>
<td>-.60</td>
<td>-.04</td>
<td>-.23</td>
</tr>
<tr>
<td>Entry into Health System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Provider:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.F. in Usual Market</td>
<td></td>
<td>-.06</td>
<td>-.17</td>
</tr>
<tr>
<td><strong>GAP:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALT: Contiguous Townships w/H.F.</td>
<td>-.19</td>
<td>.56</td>
<td>.07</td>
</tr>
<tr>
<td>ALT: Private Sector Use</td>
<td>.34</td>
<td>.36</td>
<td>.51</td>
</tr>
<tr>
<td>ALT: Distance to M.D.</td>
<td>.29</td>
<td>.62</td>
<td>-.07</td>
</tr>
<tr>
<td><strong>GAP: F.P. Method</strong></td>
<td>-.31</td>
<td>-.19</td>
<td>-.45</td>
</tr>
<tr>
<td><strong>Setting:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruralness of Location in Market</td>
<td>-.26</td>
<td>.55</td>
<td>.37</td>
</tr>
</tbody>
</table>

Canonical Discriminant Functions Evaluated at Group Means (Centroids)

<table>
<thead>
<tr>
<th>Group</th>
<th>Function 1</th>
<th>Function 2</th>
<th>Function 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>.807</td>
<td>1.025</td>
<td>-.064</td>
</tr>
<tr>
<td>Drugstores</td>
<td>.327</td>
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<td>.313</td>
</tr>
<tr>
<td>Private M.D.s</td>
<td>.430</td>
<td>-.156</td>
<td>.326</td>
</tr>
<tr>
<td>Government</td>
<td>-.204</td>
<td>.032</td>
<td>.011</td>
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</tbody>
</table>

Eigenvalue          | .0901      | .0383      | .0313      |
Percent of Variance | 56.4       | 24.0       | 19.6       |
### Appendix A.6.2. Effectiveness of Factor Analytic Variables in Discriminating Between Users and Non-Users of Family Planning (Analysis with Factor Analytic Dimensions.)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Current Use (0/1)</th>
<th>Ever-Use (0/1)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
</tr>
<tr>
<td></td>
<td>(Func 1)</td>
<td></td>
</tr>
<tr>
<td><strong>USER:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FD: Demographic</td>
<td>146.2***</td>
<td>37.08****</td>
</tr>
<tr>
<td>FD: SES</td>
<td>10.22***</td>
<td>2.08</td>
</tr>
<tr>
<td>FD: Rural Lands</td>
<td>3.39*</td>
<td>-</td>
</tr>
<tr>
<td>FD: Nuclear Family Type</td>
<td>22.63***</td>
<td>5.35**</td>
</tr>
<tr>
<td>Entry into Health System</td>
<td>6.51**</td>
<td>3.95**</td>
</tr>
<tr>
<td>Native to Local Area</td>
<td>.19</td>
<td>-</td>
</tr>
<tr>
<td>Trips to Market</td>
<td>16.95***</td>
<td>11.25****</td>
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<tr>
<td>Trips to Bangkok</td>
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<td>-</td>
</tr>
<tr>
<td><strong>PROVIDER:</strong></td>
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<td></td>
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<tr>
<td>FD: Size of Facility</td>
<td>3.82*</td>
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</tr>
<tr>
<td>FD: Demographic</td>
<td>1.25</td>
<td>7.08***</td>
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<td>FD: Attitudes</td>
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<td>Provider's Age</td>
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<tr>
<td><strong>GAP:</strong></td>
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<tr>
<td>FD: Distance to Competition</td>
<td>3.03*</td>
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<td>132.8****</td>
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<td>FD: Family Planning Gap</td>
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<td>Distance to Govt. H.F.</td>
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*Note:* The table shows the effectiveness of factor analytic variables in discriminating between users and non-users of family planning. The variables are classified under User, Provider, and GAP categories. The table includes univariate and final F-ratios along with discriminant coefficients.
Appendix A.6.2 (Continued)

<table>
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<tbody>
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<td></td>
<td>Univariate F-Ratio</td>
<td>Final F-Ratio</td>
</tr>
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<td>FD: Rural-Urban Setting</td>
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<td>-</td>
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<td>FD: FP Center in Market</td>
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<td>-</td>
</tr>
<tr>
<td>Local Disparities</td>
<td>5.71**</td>
<td>5.57**</td>
</tr>
</tbody>
</table>

Overall F Statistic 23.05 28.30
Final Chi Square 206.39 275.78
Eigenvalue .253 .369
Canonical Correlation .449 .519
Final Wilkes Lambda .798 .731
% Correctly Classified 68.1% 73.8%
Sample N 922 886

* = .10 level of significance
** = .05 level of significance
*** = .01 level of significance
**** = .001 level of significance

- Insufficient F Ratio (F < 1.0) to enter final equation.

aFD = Factor Dimension, HF = Health Facility.
Appendix A.6.3. Effectiveness of Factor Analytic Variables in Discriminating Among Users of Different Types of Family Planning Providers. (Analysis with Factor Analytic Dimensions.)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Providers (4 Types)</th>
<th>Non-Govt./Govt. (0/1)</th>
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</thead>
<tbody>
<tr>
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<td>(Func 1)</td>
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<tr>
<td><strong>USER:</strong></td>
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<td></td>
</tr>
<tr>
<td>FD: Demographic</td>
<td>.67</td>
<td>2.31*</td>
</tr>
<tr>
<td>FD: SES</td>
<td>2.13*</td>
<td>-</td>
</tr>
<tr>
<td>FD: Rural Lands</td>
<td>.85</td>
<td>-</td>
</tr>
<tr>
<td>FD: Nuclear Family Type</td>
<td>.81</td>
<td>-</td>
</tr>
<tr>
<td>Entry into Health System</td>
<td>3.83***</td>
<td>2.74</td>
</tr>
<tr>
<td>Native to Local Area</td>
<td>.32</td>
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</tr>
<tr>
<td>Trips to Market</td>
<td>1.45</td>
<td>1.02</td>
</tr>
<tr>
<td>Trips to Bangkok</td>
<td>.18</td>
<td>-</td>
</tr>
<tr>
<td><strong>PROVIDER:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FD: Size of Facility</td>
<td>3.88***</td>
<td>2.15*</td>
</tr>
<tr>
<td>FD: Demographic</td>
<td>1.23</td>
<td>-</td>
</tr>
<tr>
<td>FD: Attitudes</td>
<td>.27</td>
<td>-</td>
</tr>
<tr>
<td>Provider's Age</td>
<td>1.45</td>
<td>-</td>
</tr>
<tr>
<td><strong>GAP:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FD: Distance to Competition</td>
<td>2.90**</td>
<td>-</td>
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<td>9.52****</td>
</tr>
<tr>
<td>FD: Socio-Demographic Gap</td>
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<td>3.41***</td>
</tr>
<tr>
<td>FD: Family Planning Gap</td>
<td>3.39**</td>
<td>3.22**</td>
</tr>
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<td>Distance to Govt. H.F.</td>
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248
Appendix A.6.3 (Continued)

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<td>FD: FP Center in Market</td>
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* = .10 level of significance
** = .05 level of significance
*** = .01 level of significance
**** = .001 level of significance

- Insufficient F Ratio (F < 1.0) to enter final equation.

\(^a\)FD = Factor Dimension, HF = Health Facility.
APPENDIX B.I.
DIFFUSION STRATEGIES FOR FAMILY PLANNING
IN THE THIRD WORLD: A REVIEW

Introduction

It is important to distinguish among the different delivery strategies that have been used or experimented with to diffuse family planning in the past. Drawing on a large body of literature, this appendix reviews in detail the different family planning delivery strategies which were introduced to the reader in Chapter II. Seven distinct delivery strategies to bring birth control methods to the people are pointed out. Each diffusion strategy encompasses a complete link between the diffusion agency (diffuser) and the adoptor (acceptor), that is, it comprehensively involves both the supply and demand of family planning.

In general, therefore, we are mainly concerned with delivery systems, service systems or channels of diffusion. We are dealing with not only the diffusion of an innovation, but also, in the case of non-terminal methods of birth control, a continuing process, something
that must be diffused over and over, often under changing conditions. In this sense we are working with a process somewhat analogous to the marketing of a product.

Throughout this review, different communication and mass media strategies, as well as incentives, will not be considered as strategies in themselves, for they are concerned with information spread or ways to accelerate the diffusion of family planning. Rather, these topics will be discussed in conjunction with the seven delivery strategies as "facilitators" of the diffusion process.

This appendix will now consider specific diffusion strategies. It will mention which methods of family planning they are most often used for, and suggest how appropriate, successful or cost-effective the experimental and programmatic efforts have been. The following seven delivery strategies will be detailed in turn. At the end of this appendix some integrating and concluding remarks will be made. The seven delivery strategies to be discussed in turn are as follows:

1) Hospital/clinical approach,
2) Clinic extension workers,
3) Expanded role for paramedics,
4) Integrated programs (including postpartum/postabortion programs),
5) Mobile unit strategy,
6) Intensive camps, and
7) Locally-based distribution.
The Hospital/Clinic Diffusion Strategy

Probably the most tried strategy for the diffusion of family planning has been through the medical clinical network. The clinic approach can refer to specialty family planning clinics or family planning services combined with public health activities. Delivery can be from a hospital clinic or smaller professionally-staffed clinic. The early prevalence of the specialty clinic was probably due to the predominance of medical doctors and public health personnel in early programs who mimicked the traditional Western clinical approach of single-purpose clinics on account of the controversial nature of family planning. Despite a good record in their pioneering roles, specialty family planning clinics have not fared well when used in national programs. Potts (1976) argues that family planning clinics are too expensive and culturally inappropriate for developing countries and points out specifically that they: "1) have resulted in too much physician involvement in the reversible methods of contraception; 2) have often concentrated on a single method—even when the so-called 'cafeteria' approach has emerged; 3) nearly always assume family planning is a task for women not men; 4) use personnel inefficiently; and 5) soak up heavy capital investment, but have an outreach limited to a few kilometers radius." It appears the diffusion of family planning requires more imaginative, less inefficient efforts than the clinic-oriented approach of the medical field if it is to be successful.
Most all developing countries with population programs use clinic approaches, but few today rely solely on their government health/family planning infrastructure. Such an approach can be feasible, as suggested by the success of the predominantly clinic-oriented program of the Ministry of Public Health in Thailand (Hemachudha and Rosenfield, 1974) in the early 1970s.

Organized, planned and implemented through the government rural health and hospital services, this system increased the number of new acceptors from 57,000 in 1968 to 450,000 in 1974 without incentives, targets, field workers (Porapakkham, et al., 1975), or the use of much mass media. It operated in the urban areas through hospitals and physician-manned clinics and in the rural areas in over 4,000 primary health care centers. Yet this system soon discovered the advantages in strategies broader than the physician-staffed clinic (Rosenfield and Limcharoen, 1972). Acceptance levels were greatly increased by a Ministry decision in 1971 to allow auxiliary midwives at the primary health care centers to dispense the pill and by a quite successful hospital postpartum program. Recently, there have been more extensions of service away from the pure clinic approach and towards more home visiting by government health workers, the use of traditional medical practitioners, and a community-based distribution scheme. Nonetheless, the dominance of the large Ministry of Public Health clinical infrastructure still remains. Whether or not the Ministry's program has been the principal moving force behind the large number of acceptors, however, is highly suspect. Statistics show a large pre-program use
from private sources of supply (Fawcett, et al., 1969) as well as pre-program demand for family planning on the part of the rural people. It appears that this favorable environment for family planning acceptance actually helped reveal the limitations of the somewhat successful early clinic approach of the Thai government and suggested the need for a more flexible program to take advantage of the large pool of potential acceptors.

The clinic approach has more often than not retarded the diffusion of family planning by placing a low priority on family planning within the health system. Service was offered at extremely limited times, such as in Puerto Rico where at those places "where the number of patients needing services of the program is small, only one half-day clinic is held per week" (Kelly, 1972, 51). This assumes the women all can be there (and remember) that one particular time of the week, not to mention scheduling IUD insertions which should take place during the woman's menstrual period. Failures of the clinics to take the acceptor's convenience into account with open hours is still a problem. This was noted more recently in Kenya, which "as late as 1974 only about one-third of the government's clinical facilities were offering family planning and many of them were doing so on a weekly or even a monthly basis--all of which meant that large portions of the society were unserved" (Freedman and Berelson, 1976). From 1969 to 1974 the annual rate of new acceptors in Kenya went from 1% to 2% of the eligible women, having a negligible effect on reducing the birth rate.
The failures and shortcomings of the pure clinic approach to the diffusion of family planning have become so evident that recent discussions about "clinic strategies" cover topics such as home visits, father's clubs, and community health workers (Bamisaiye, et al., 1978). Indeed, the pioneer of the clinic strategy, the International Planned Parenthood Federation, while trying to divest itself of its clinic facilities, is looking towards more innovative strategies to diffuse family planning: "Conventional clinic services in many family planning programmes have suffered from the shortage of health manpower, especially doctors, and the general inaccessibility of the advice and supply centres, especially in the rural areas. Recognizing the need for a more cost-effective and far-reaching delivery system, family planning associations have been trying various ways to overcome these two basic problems" (IPPF, 1975).

**Clinic Extension Workers**

The most immediate remedy to an ailing clinic-based system is to send out extension workers to motivate and recruit new women to family planning. Indeed, a large variety of such outreach strategies have been experimented with as possible panaceas for underutilized clinical systems. This basic shift in approach heralded the change from the Clinic Era to the Field Era (Rogers, 1973, 131). The medical/family planning delivery approach intellectually based on the pre-1960 Western planned parenthood example was tried and found wanting. The scarcity of
doctors, high cost of infrastructure and low utilization of clinics and other factors hastened a move towards extension strategies in the diffusion of family planning. Taking heed of the framework of communications researchers, who found interpersonal contacts to be much more important in the later stages of decision-making of the five-step classical model of the diffusion of information, family planning policymakers decided to counteract the impersonality of the clinics, as well as social and real distance from the people, by using extension workers. Such strategies have taken many forms: the clinic-based family planning field worker, the rural health worker with home visits and postpartum follow-ups, hired motivators, messengers or canvassers, and organized volunteers. The strategies have sought to expand the influence and drawing power of the family planning clinic, and indeed they do: "in rural Indonesia the typical clinic-shed without field workers has a radius of about 2.7 miles and serves a population of about 5,000. When field workers are added, the clinic-shed expands to a radius of about 6 miles, and a population of roughly 25,000" (Rogers, 1973, 136). Clinic extension workers are active in many government programs now, home visitors producing up to 60% of the net acceptors in the national programs in Korea, Taiwan and the Philippines (Keeny, 1975, 164).

Several different approaches have been evaluated in field and research experiments. We therefore shall review their relative merits, bearing in mind, of course, that there are many personal, cultural and other factors not mentioned that affect extension worker performance.
Following that, we discuss respectively the types and characteristics of extension workers, as well as their effectiveness and their performance by type of payment.

Types of Extension Workers

There is a various assortment of clinic extension workers, of which at least one or likely more are found in countries with active family planning programs. "They are at times called motivators, out-reach workers, home visitors, and family planning educators. They may be health workers, social workers, or extension workers; they may be individuals who have accepted family planning practice; they may be informal community leaders" (Anderson, 1973, 89). They are most often paid, sometimes volunteer, and sometimes volunteer without ever really knowing it. The latter case can be a very simple, very inexpensive way to promote family planning that program people often are not aware of.

In Thailand in order to enhance the effectiveness of already demonstrated word-of-mouth communication (Fawcett and Somboonsuk, 1969), IUD acceptors at a Bangkok hospital were given cards for "quick and special service" to hand out to interested friends. Many cards were dispersed by the women, and the project evaluation showed the cards themselves made a noticeable difference. The results of a somewhat similar card scheme in a southern Indian hospital sterilization program showed that "satisfied adoptors are the most important and successful change agents in promoting family planning" (Pillai, et al., 1977).
Another distinct and rather successful clinic extension scheme is the canvasser who has been used in India to promote vasectomy on a mass basis. These canvassers are self-selected, often quite successful family planning salesmen who work solely on incentives of 10 Rs. ($1.33)/acceptor. They have been successful in reaching disadvantaged segments of the community, those least accessible to government workers and the mass media, often while creating elaborate social networks and working through "satisfied customers." However, criticisms of malpractice and misinforming potential acceptors led to the canvasser program being discontinued in Madras state. Nevertheless, with an ensuing severe decline in vasectomy cases performed and because of the canvassers' proven effectiveness, the program was later reinstated in a modified form.

Characteristics of Extension Workers

Probably the most common clinic extension worker is the government midwife or special family planning auxiliary worker. Changing the government worker's job to include home visits for motivation and sometimes dispensing family planning has been undertaken in many countries, quite often with an implicit or explicit model of communications flow in mind. Communications research has shown that the greater the similarity of characteristics between the conveyor of information and the receiver (in our case, the field worker and the potential adopter), the more successful the interaction and hence the communication will be. A further corollary stresses the importance of
the conveyor's technical competence about the family planning method being promoted. In Indonesia these theoretical distinctions served as a basis for choosing the full-time government paraprofessionals for the front-line field worker staff in the national program, with a secondary supportive role for the traditional midwives. This so-termed homophily-heterophily hypothesis (Rogers, 1973) has been tested by several other researchers to discover those characteristics associated with the successful performance of field workers. Ross and others (1972) reported that "age, marital status, and academic education of field workers have been the characteristics most studied in analyzing performances in the Taiwan program, with age and marital status showing some correlation and with achievement and education showing very little." In H.C. Chen's study in Taiwan (quoted in Worth, et al., 1971) this pattern was empirically confirmed: "Married women do better than single ones. Women aged 35-40 do better than younger or older women. Education above junior high level does not increase productivity. Productivity does improve with experience—at least during the first two years." These same general patterns (for age, marital status and parity) were recently confirmed for a large sample of "community agents" in rural Mexico (Azcona, et al., 1980). Repetto (1977) reconfirmed Rogers' homophily-heterophily thesis in Indonesia, where women field workers performed better, married workers better than unmarried, older better than younger and less educated better than educated. However, Repetto interestingly found with a one-way analysis of variance test that there is yet a "large variation in performance among individuals
that cannot be explained in terms of the easily measurable characteristics" of his study. This suggests that the make-up of a field worker's characteristics in respect to her performance has indeed much greater complexities than the present research frame leads us to believe.

Extension Worker Effectiveness by Type

In Pakistan the National Family Planning program attempted to use the granny midwife ("dias") as an extension worker, primarily for IUDs. It was felt the traditional birth attendant would be an effective family planning link with the rural people. However, there were many problems, including a high attrition rate, and therefore the program led to the Sailkot Project (Rogers, 1973; Osborn, 1974; and Viorst, 1976). In this project communications theory again underlined the basic design. The field workers' characteristics spelled out opposites of the granny midwife program: full-time, literate (yet local), couples were hired in teams to motivate, supply contraceptives, keep records and maintain contact with eligible couples at least once every three months. Incentives were offered to the family planning field workers for each acceptor completing one year without a pregnancy. This elaborately-designed program gave results which were encouraging, an estimated 15% of the eligible women protected, yet seemed unduly expensive (500 personnel involved for 12,000 year-acceptors and 24,000 total acceptors in a year). Also, the evaluative data may have been overly optimistic due to inaccuracies (Viorst, 1976).
In the rural Philippines a large-scale program was implemented in 1977 to aid the clinic system and increase outreach effectiveness by changing from part-time to full-time non-medical family planning motivators and suppliers. The new "Full-Time Outreach Workers" were to focus on making home visits, setting up local supply points for pills and condoms, and referring clients to the clinics. At the local supply point they were to recruit a local volunteer to man that supply point and motivate women in an area with around 60 to 100 eligible women. The Full-Time Outreach Workers were especially instructed to concentrate on areas distant from the family planning clinic. Although it is yet too early to definitively judge this program, evaluation surveys completed in 1978 and 1980 (Laing, 1980, 1981) give mixed, but not very encouraging results. Positive accomplishments for the outreach program included the establishment of many well-stocked supply points in very rural areas, better clinic follow-up, and the active involvement of many supply point volunteers in home-visiting and referral of clients to clinics. On the other hand, several deficiencies of the program have become clear. Supply point record-keeping has been inadequate with only about half of the eligible couples included and many couples completely unaware of the local supply point. Also, referrals were quite low, 32 percent of the Full-Time Outreach Workers not making any referrals to a clinic in the month preceding the 1980 survey, despite a catchment area of approximately 2,000 married couples of reproductive age. Home visits by the Full-Time Outreach Worker were also quite insufficient: "it is clear that most Full-Time Outreach Workers were able to maintain
adequate contact with only a small fraction of the married couples of reproductive age they were expected to cover" (Laing, 1981, 10). With an almost complete nationwide network of 2,600 Full-Time Outreach Workers and an average of 15 supply point volunteers under their jurisdiction, a greater penetration of the rural areas by the outreach system might have been expected. Yet only 12.6 percent of the interviewed users of contraceptives reported either of the two as their current source of supply or information and over half of the current users did not even know about the supply points (Laing, 1981). Nevertheless, progress has been made in the Philippine outreach program and the excellent project monitoring with rapid feedback should facilitate quick implementation of some of the needed changes to make the program more effective. A few year's time should tell if such a large-scale outreach approach is warranted.

Two other field experiments tested field worker performance, but in relation to a different strategy: pamphlet delivery messengers. These two studies (Stycos and Mundigo, 1974; and Simmons, 1973) are provocative in that they question the accepted wisdom by suggesting the individual caseworker approach is of highly limited effectiveness. Stycos and Mundigo conclude that the messenger system for delivery of family planning pamphlets in the Dominican Republic was not only easier to administer, but also much less expensive and of equivalent effectiveness in bringing women to the clinics compared to the motivator personal-contact system. In the Columbia study (Simmons, 1973) the results were basically the same except that the personal motivator system was slightly more effective than the pamphleteers.
Performance by Type of Payment

In Thailand, the Philippines and Taiwan, field experiments were carried out to judge relative performances based on method of field worker payment. The Thai study (Porapakkham, et al., 1973, 1975) included full-time salaried workers, full-time workers with a minimum salary and commission based on performance relative to other workers, and part-time volunteers, covered only by a nominal fee for expenses. Somewhat surprisingly, the performance of the volunteers was especially good, while those on the incentive plan fared poorly. While these data contradict the findings of past research that note incentives affect field worker performance (Rogers, 1973), problems in administering the incentives and a small sample size permitted no definitive conclusions from this study. In the Philippine study (Phillips, et al., 1975) four groups of motivators with different payment schemes were monitored. Motivators who were paid on a per acceptor basis performed best, while bonus schemes paid with salaries had little effect as did quota plans, whether for groups or individuals. One further important finding was that the researcher must be wary of the possibility of considerable misreporting. Falsification of records was prevalent for the field workers in this study, as well as the Sailkot (Pakistan) Project (Viorst, 1976). Lastly, in Taiwan two experiments on payment schemes were carried out. The first, the Taiwan Referral Fee Program, reaffirmed that payment per acceptor can be quite effective. The second, the Agent Incentive Study, found salary-plus-bonus payments doubled the level of acceptance.
All in all, the consensus of opinion indicates the importance of the extension worker strategy for the diffusion of family planning. Performance is usually better when the worker is paid on an incentive scheme, is from the local area, and has similar characteristics to the local people except for her expertise in family planning techniques. The field worker has been hailed as "the mainstay of the Taiwan as well as the Korean family planning program" (Cernada and Huang, 1970). In Indonesia acceptors per clinic doubled when family planning field workers were added to the local staffs (Rogers, 1973). In the Isfahan Model Family Planning Project field workers played a crucial role in recruiting acceptors and helping them obtain their first contraceptive supplies, much more so than functionaries, mass media or health workers (Treadway, et al., 1976). Experimentation with various types of extension workers, for example the grassroots level "Female Depot Holders" in Bangladesh (Husain, 1979), still goes on in many countries. Nevertheless, all the favorable points aside, no one as of yet has thoroughly tested how efficient extension workers are. The studies in this direction (e.g., Stycos and Mundigo, 1974) suggest that indeed alternative strategies may be more cost-effective.

An Expanded Role for Paramedics

In recent years family planning researchers and program administrators have been increasingly calling for an expanded role for paramedics in the delivery of family planning. Since the nineteenth
century restrictive laws have been put on the books limiting the practice of medicine and dispensing drugs to licensed doctors and pharmacists. Such restrictions have acted as a serious barrier to the diffusion of family planning to vast numbers of people in developing countries where such personnel are in short supply, especially to those people living in the rural areas and the slums. Dr. Halfdan Mahler (1973), Director General of the World Health Organization, cited his opposition to professional monopolization of the medical health fields so strongly as to say it is "nonsensical to insist upon using only doctors or other categories of professionally qualified personnel" for the delivery of simple techniques of family planning.

Today the increasing use of paramedics in family planning is becoming a reality. However, this phenomenon is still in a slow-moving uphill battle against the conservative faction of the medical profession which has a good deal of power to protect what it perceives as its interests. The arguments for the use of paramedical personnel are convincing: first, most fertility regulating methods are simple enough to be done well by a nonphysician with minimal training. In fact, it has been reported that paramedics do better jobs than doctors because they take more care and precaution. Second, by allowing paramedics to deliver family planning, accessibility of the general populace to family planning is dramatically enhanced, often with an accompanying increase in the number of acceptors. In 1970 when the Ministry of Public Health in Thailand decided to allow auxiliary midwives to dispense the pill, the number of government outlets increased from 350 to over 4,000 and
new acceptors concomitantly jumped from 8,000/month before the ruling to 30,000/month at its peak soon after the ruling (Rosenfield, 1974a). Third, as Atkinson and others (1974) have shown, the health benefits of wider distribution of contraceptives can be substantial in areas where maternal care is poor. The risk of maternal death that could result from not using contraception is large (25-500 deaths/100,000 live births), compared to an almost negligible risk of death from the pill-related thromboembolic (blood clotting in the veins) disease (about 3 deaths/100,000 users). It has been suggested by some that if all pregnancies beyond the fourth and in women over the age of 35 could be prevented by contraception, this would have a more positive effect on maternal and infant health than any other single step that could be taken in the field of health (Rosenfield, 1974b, 98). Fourth, most restrictive laws against paramedics deny the poor and rural people access to family planning. Such restrictions can easily be overcome by the more affluent with their better access to physicians (Potts, 1975). Fifth, paramedics are more numerous than physicians, more often reside in rural areas and usually have a closer affinity with the local peoples. Sixth, they are less expensive to train and support and therefore more cost-effective than physicians, and besides can free time from doctors' workloads. Lastly, as most physicians are male, paramedic delivery of family planning allows greater opportunities for female workers, who are more preferred in many cultures (Akin, et al., 1980).

From the legal point of view, barriers to nonphysician distribution of family planning can be overcome. It is often not necessary to change
laws, but rather to promote facilitating changes in regulations of the appropriate government agency, which in most developing countries is the ministry of health. Technically, one can argue the right to better access to family planning as every human's right to practice family planning on the basis of the 1968 declaration at the United Nations Conference on Human Rights in Teheran (Paxman, et al., 1976). Moreover, Malcolm Potts (1975) points out in an intuitively convincing way there is no logical basis for legal restrictions on family planning. He argues that "coitus interruptus, prolonged lactation and the rhythm method do not require any material aid.... Therefore, they have never been, and will never be, regulated by any aspect of the law. They are widely used and can be tolerably effective. Their practice immediately discredits and invalidates any legal effort to restrict public access to the other means of fertility regulation" (Potts, 1975, 89).

A further legal, as well as semantic, problem associated with discussion of paramedics is what type of "doctor" are we actually referring to? The medical and public health fields abound with different combinations of the words like paramedic, auxiliary, practitioner, nonphysician and medical worker used with different meanings in different contexts and countries. These ambiguous titles create semantic problems and point out the need for more standardization in the international health field. For the purposes of this review, we make only two distinct categories: the first are officially-trained nonphysicians who have a year or more of medical training and more than average general education (approximately 10 years). Possible examples
are the auxiliary midwives, nurses, and health station paramedics. The second group are the traditional sector medical practitioners made up of granny midwives, local herbal doctors, unlicensed medics and other "unofficial" practitioners. These practitioners, although numerous and performing very needed services, especially in the rural areas of developing countries, are often looked down upon and accorded little legitimacy by the western-oriented professionals. "Paramedics," as we have defined them and how they are described in the family planning literature, need not be considered as working under a doctor's direct supervision.

Our first group of personnel, the government paramedics (for lack of a better label), has received the most attention as diffusion agents for family planning. They have been allowed to provide, in different countries to varying extents: 1) spermicides and condoms, 2) pills and injections, 3) IUDs, and 4) vasectomies, tubectomies, menstrual regulation, and abortions. More countries have permitted government paramedics to be involved with spermicides and condoms than pills, injections or IUD's. On the other hand, sterilization, menstrual regulation and abortion are allowed by only very few countries, most notably mainland China (Chen, with Miller, 1975; Wilenski, 1976).

Use of the government paramedic to deliver spermicides (if available) and condoms is quite common. Distribution of oral pills is more recent, although earlier paramedic involvement with pills started in 1968 in Sri Lanka (Wright, 1975). There has been a rapid acceptance of this function of the paramedic in many countries: People's Republic
of China, the Republic of Korea, Malaysia, as well as others. Several countries now allow paramedics to prescribe pills using a simplified checklist to screen for possible problems, while pilot projects are going on to monitor feasibility of this approach in other countries (e.g., in Iran, Zeighani, et al., 1977). Government paramedics, especially women, have also in some countries been allowed to insert IUDs and have often shown competence on a par with or better than physicians, for example, in Columbia (Einhorn and Trias, 1978), Korea (Bang and Choi, 1968), Iran (Zeighani, et al., 1976), Thailand (Wright, et al., 1977) and Pakistan (Kaul, 1969). Training programs in the Philippines and Turkey for auxiliary nurse-midwives to provide IUD services have met with success (Akin, et al., 1980). With the remarkable exception of China, sterilizations and abortions have not yet been permitted in most countries. Shatlock and Fendall (1975), however, examined vasectomy and menstrual regulation in detail and found both to meet their criteria of being "effective, safe, and easy to perform." They recommended that countries go ahead with such a program, provided the necessary caution and good training. There is already evidence to suggest that paramedics performing these minor operations could very well be the wave of the near future in the provision of family planning services. Successful experiments with paramedics providing sterilization (Chowdhury and Chowdhury, 1975) and menstrual regulation (Bhatia, et al., 1980) in Bangladesh have been reported.

As well as expanding the roles of government paramedics, some governments have taken advantage of the numerous traditional sector
practitioners. The most common have been granny midwives ("traditional birth attendants") who, because of their widespread popularity, familiarity with the community and experience in child delivery and infant care, can be a valuable source of manpower for family planning programs, as well as an important link with the community. Traditional midwives have been used extensively in family planning educational programs and referral, as well as supplying and selling the pill and other contraceptives.

In rural Thailand the traditional birth attendants are the most commonly ever-used medical/health personnel (Day and Leoprapai, 1977). To tap this source the Ministry of Public Health has trained over 18,000 granny midwives in maternal and child health and to motivate for family planning. Other countries have put the granny midwives to various uses: in Indonesia as field staff (Rogers and Solomon, 1975), in Malaysia for motivating and delivering pills (East-West Communication Institute, 1974; Peng, et al., 1972), and in Pakistan for inserting IUDs (Rogers, 1973), and in the Philippines and India for recruiting adopters.

The earliest attempts to involve granny midwives in family planning were in South Asia in the 1950s and 1960s and met with little success (Mani, 1980). Problems evolved because of inadequate training and misunderstandings between the lowly status "dais" and government physicians and administrators. The Pakistani program which started in 1965 and allowed the granny midwives to insert IUDs ended in failure in 1970. The more successful and still continuing projects using traditional birth attendants in family planning have been associated
with countries in Southeast Asia: Indonesia, Malaysia, Thailand and the Philippines (Simpson-Hebert, et al., 1980). In Latin America several incipient projects are underway; however, in the Middle East and Africa there has been little activity. "Experience suggests that programs like those in Malaysia and Mexico, where traditional midwives have been allowed to distribute contraceptives directly, are more effective than programs where traditional midwives are required to refer their clients to a health center for all family planning services" (Simpson-Hebert, et al., 1980). Also very important is both community and government support. Rogers and Solomon (1975) review the past performance of granny midwives and speculate optimistically that they can play a valuable role if proper supervision is given so to maximize their effectiveness within a specific country situation.

Another group of nonphysician traditional sector practitioners are the traditional healers and unlicensed medics. Few governments have realized their potential and much less has been written about them in the family planning literature. The Ministry of Public Health in Thailand is looking at the possibility of permitting some of them to do male sterilizations, since they have been competently performing vasectomies (illegally) for years.

**Integrated Programs**

A fourth diffusion strategy involves the integration of family planning services into larger, more comprehensive programs. In this
section we will discuss programs integrated with hospital postpartum and postabortion programs, maternal and child health, health, nutrition, parasite control programs, and integrated development in general. An important distinction in this type of strategy is at what administrative level of activity the program is operating. The postpartum strategy integrates family planning into the large urban hospital setting. On the other hand, there have been several projects which have attempted to integrate family planning into health and other programs in the rural areas. Such programs are predicated on stimulating grassroots support and involvement. We therefore have discussed the integrated program strategy in two parts, the first, a somewhat lengthy description and critique of postpartum/postabortion programs, and the second, the family planning integration schemes more closely tied with rural and community development.

**Postpartum/Postabortion Programs**

Although not a new idea, the postpartum program proposed by The Population Council in 1965 was certainly innovative in terms of its sheer size and widespread international coordination. In the nine years from its inception to its termination by The Population Council in 1974, approximately 1.1 million acceptors from 138 hospitals in 21 countries adopted a method of family planning. The International Postpartum Program seemingly had proven its primary objective "to demonstrate the feasibility of providing family planning information and services as part of hospital-based maternity care in a variety of settings"
(Castadot, et al., 1975, 5). As Population Council funding was phased out, efforts were made to aid individual programs to become incorporated into their respective national family planning programs (if they were not already), and to find alternative sources of financial support if necessary. The legacy of the program should carry on and "eventually family planning for purposes of either limitation or spacing should become a routine postpartum practice" (Rosenfield, 1974a).

The advantages to a postpartum program are many: first, and probably most importantly, it deals with a crucial "segment of the market," women of proven fecundity, the child bearers. How many sterile women, subfecund couples or empty houses might field workers visit each year? The acceptors in the International Postpartum Program were both of lower age and parity (approximately a median age of 26 and parity of 2.5) than acceptors in national programs in almost all countries. This is all the more convincing if compared to the average age of vasectomy acceptors (38 years) of the spectacular Gujarat camp campaign in India (Thakor and Patel, 1972). The postpartum approach also catches a very important group of women usually missed by other family planning strategies: the early (soon after postpartum, i.e., highly fecund) conceivers. Several studies have shown that early conceivers tend to be repeaters, never contacted by family planning motivators because they are most always currently pregnant and therefore ineligible. Their risk of pregnancy becomes very high only a few months after childbirth (Ross, 1970).
Women are also more amenable to accepting family planning right after childbirth: often younger women can be convinced of using a method for spacing. Field studies have shown that a wait of only a short time will substantially reduce the number of acceptors that would have adopted right after childbirth (Echevevry, 1973). Another important selling point of the postpartum approach is that it is inexpensive, costing for the whole International Postpartum program an international average of about $5/acceptor. Compared to national family planning program costs, postpartum cost/acceptor can be several times less expensive (Castadot, et al., 1975, 20). The equipment, facilities and women are all at hand at the hospital. The extra expense of the motivational workers (who can see more women in a day than when in the field) and the doctor's time is relatively small. However, a major disadvantage is that the hospital delivery is a relatively expensive health strategy in itself, especially when compared to rural midwife delivery. Nevertheless, if hospital deliveries are to be part of the health program, the small extra cost of postpartum family planning should be added on. Another advantage of postpartum programs is that increased use of contraception considerably reduces maternal mortality and morbidity due to pregnancy, childbirth and abortion. Other benefits for the family planning movement in general are that a hospital postpartum program can help legitimize family planning in the eyes of the public, and can be an important demonstration to encourage a national family planning program not yet underway. Such was the case in Columbia, Thailand, Venezuela, and Mexico (Castadot, et al., 1975).
The final selling point of this strategy is its success. Its attraction of large numbers of fecund acceptors, especially young and low parity women, speaks for its effectiveness. The International Postpartum Program in Thailand in 1972 had 66,000 acceptors or 16.4% of the large national program. Hong Kong reached 60% of their national program acceptors through postpartum facilities, and Singapore's postpartum program and Postpartum Contact Service (not affiliated with the International Postpartum Program) in 1974 were able to reach nearly half of the women who gave hospital births, which were 80% of all deliveries (UNFPA, 1976, 17).

Disadvantages of the postpartum approach are few but worth our concern. One of the most serious was the technical problem of high rates of expulsion of IUDs, for example, as many as 45% of the devices were expelled within 30 days in Columbia. However, because the women were forewarned and about 95% of the IUDs were reinserted, problems were minimized (Echeverry, 1973). Such higher rates of expulsion were found to be related to too short a time between delivery and insertion, and insertion on the fourth day after delivery lowered expulsion rates to an acceptable figure (Castadot, et al., 1975, 31).

Immediate postpartum dispensing of the pill has given rise to some problems. Oral contraceptives have been shown to possibly inhibit lactation or decrease milk volume (Borglin and Sandholm, 1971; Koetsawang, et al., 1972a and 1972b; Kaern, 1967; Kora, 1969; and Chopra, 1972). A possible remedy to this might be the substitution of the injectable depo-medroxy progesterone acetate (DMPA) which seems to
promote lactation (Koetsawang, et al., 1972a). However, until more definitive conclusions can be reached about the effect of oral contraception on lactation, it would seem wise to defer prescription of pills until six weeks to three months postpartum (Atkinson, et al., 1974).

Besides method-related problems, another possible disadvantage of the postpartum strategy is that it can be used to justify expansion of urban/hospital oriented services when rural-based services are in great need. The vast majority of deliveries in developing countries takes place in the rural areas. Hospital postpartum services, though suitable for the urban minority, are not appropriate for a country's nationwide strategy, and its success should not be used as a rationale for more expensive hospital facility expansion throughout the countryside.

Finally, a related problem is whether developing countries can really afford to maintain postpartum programs (Castadot, et al., 1975). The answer is probably "yes," if they can afford the hospitals.

As far as the methods most commonly used in postpartum strategies, there is much variation country by country. However, taking all 21 countries in the International Postpartum Program together, IUD's were adopted by 48% of the total acceptors, pills next with 35%, sterilizations with 10% and becoming increasingly popular, injections with 1% and others 6%. To demonstrate differences in country programs, it is interesting to compare these statistics with those from the large Indian postpartum program (with 255 hospitals participating in 1975, most all not affiliated with the International Postpartum Program).
Most popular methods in the Indian program were conventional, 49%, next sterilization, 39% (of which 10% were vasectomies and 29% were tubectomies), then IUDs, 8%, and pills, 4% (Visaria and Jain, 1976). Almost a reversal of the International Postpartum Program preferences!

The International Postpartum Program chose to diffuse family planning through central administrative diffusion agencies in most all cases, except in the U.S. and Puerto Rico, where it was more decentralized. Countries came and left the program and now most all are either on their own or integrated into national family planning programs. The impetus of the program has been felt in countries which received more inputs, such as Columbia, Venezuela, Indonesia, and Thailand; however, the impact and ideas of the program at large have spread to many countries and individual hospitals, which now operate their own programs.

The future of the postpartum approach now seems to lie in how it can draw away from strictly being a hospital postpartum program and rather extend into the rural areas of developing countries. If rural granny midwives, who deliver as many as 80% of the births in some developing countries, were to become a trained link in a postpartum strategy, the impact might be tremendous. However, training and field experiments are necessary before going ahead with such an approach. Projects integrating maternal and child health and family planning are going on around the world, but as of yet, there appear to be no comprehensive nationwide programs. The Population Council, concerned with urban bias associated with postpartum programs, initiated
experimental programs to integrate maternal and child health with family planning in Turkey, the Philippines, Nigeria and Indonesia in the mid-1970s. These programs, designed to determine the feasibility of national implementation of such a strategy, will be further discussed in the next section of this chapter.

Closely related to postpartum programs and often a part of them are postabortion programs. This approach shows promise: the "provision of immediate postabortion family planning services may be more feasible and effective than the postpartum family planning programs in some countries where most abortions are performed by qualified practitioners in the clinics or hospitals" (Su and Chow, 1976, 230). In that abortion possibly is the most widely-used single method of family limitation in the world today and with its increasing liberalization in many countries, postabortion family planning strategies may offer an excellent opportunity to capitalize on a group of highly motivated women, more motivated than women just giving birth. Service costs for the postabortion family planning are small and cost-effective. Also, the immediate postabortal insertion of IUDs and use of other methods do not have the problems associated with postpartum method use. A postabortion program in Chile showed a rate of 55% acceptors without motivation and 67% with an education program (Hardy and Herud, 1975). It seems with some extra effort, this approach may become an important future strategy, especially with the increase of private abortion clinics which governments can regulate to require the availability of postabortion family planning service.
Other Integrated Programs

Besides the integration of family planning into urban postpartum hospital and postabortion clinic programs, integration has been attempted in a variety of less urban technological settings. Although postpartum strategies can be undertaken in provincial hospitals or regional maternal and child health hospitals, the vast majority of peoples in Third World countries live and give birth in the rural areas.

The limitations of the hospital-based postpartum strategy are clear. In searching for a solution to this problem, the Population Council initiated the International Maternal and Child Health Based Family Planning Program in 1972 to discover if it would be possible "to bring some minimal professional and paraprofessional attention to every pregnant woman in a number of developing countries before, during and after delivery, for the double purpose of promoting maternal/child health and family planning" (Taylor and Berelson, 1971). From 1973 to 1976 five-year pilot projects were established in Indonesia, Turkey, Philippines and Nigeria in predominantly rural areas of about a half million. "Maternal and child health and family planning services were to be functionally integrated at all levels with the target population being all pregnant and recently delivered women and their children up to at least two years" (Miller, 1980). The rationale behind the program was that the target population would be highly motivated to adopt family planning, at least for the purposes of spacing, and with time reductions in mortality and morbidity of mothers and children would become evident.
There have been steady increases in the demand for family planning services from the programs, although a leveling off has been experienced more recently. It is yet premature to evaluate the success of these integrated programs, especially in terms of changes in demographic rates. The Bahol (Philippines) project has been extended as a pilot area for development of the national health care system at the local level and has the detailed statistical evaluative programs which should allow such policy judgments (Williamson, 1979).

The integration of family planning and health programs at all levels seems to be a natural outgrowth of the organization of national family planning programs. Eighty-four of the 93 nations with official support for family planning have family planning integrated into maternal and child health or general health services (Gold, 1975). The degree of integration varies between countries and at different administrative levels within countries; nevertheless, in that officials often work out of the same office and the local health care official often is in charge of both family planning and health, integration in some form has usually occurred.

There have been several experiments with different ways to integrate family planning with health care services. The Ghandhigram (India), Danfa (Ghana) and Etimesgut (Turkey) experiments integrated family planning into health programs with reported decreases in fertility (in Ghandhigram and Danfa) and increases in family planning use (Cuca and Pierce, 1977). The Narangwal (India) project, designed to evaluate the effects of family planning with four different types of
health programs, determined that "to get the most efficient and long-term balance of both family planning and health objectives there is no question that the combined 'family planning + women's services + child care' is to be recommended (Johnston and Meyer, 1977 citing Taylor, et al., 1975). In Thailand the Lampang, or DEIDS (Development and Evaluation of Integrated Delivery Systems), project integrated health, family planning and nutrition services for a whole district (DEIDS, 1975). The project appears successful, although the large outlay of funds for the special project might be questioned in that the control district for the project, rather embarrassingly, exhibited much more effective programs with far fewer personnel. In Matlab thana (Bangladesh) in 1977 to overcome the deficiencies of a previously tried simple household contraceptive distribution program, an integrated outreach program was employed to offer a full range of contraceptive methods along with maternal and child health services (Bhatia, et al., 1980). The success of the "female village workers" interestingly combined three of our strategies discussed in this chapter: integrated family planning/maternal and child health, clinic extension, and household distribution.

A further example of integrated programs is the integrated family planning-nutrition-parasite control program initiated by the Japanese Organization for International Cooperation in Family Planning (JOICFP) in 1976 with aid from several other international agencies. The project is presently in ten countries. Parasite control was chosen to be integrated with family planning because: 1) its use is understandable
to the people and closely related to their everyday life; 2) the results are highly visible and easily diffused; 3) it does not require a sophisticated technology, and 4) it does not obscure the purpose of promoting family planning (Kunii, 1976). Although the programs are beginning to show some promising results (Kunii, 1978), it is yet too early to judge the success of this strategy or its replicability on a national scale. Also, several problems have emerged. The re-infection rate of parasites was quite high, environmental sanitation proved difficult to improve, parasite control was too narrow a health measure and the program's main recipients were students who are not the target group for family planning (Nishioka, 1979).

Some attempts at integrated programs have suggested complete integration with all aspects of rural development. Others are more specific, such as that underway in Malaysia to integrate day care services with family planning. This program incorporates family planning into the "overall welfare of the family and society" (Hasnan, 1979), while giving high exposure of family planning to working mothers, a target population.

Family planning has been integrated with several different types of programs, though the value of this strategy is not yet certain. Much depends on the compatibility of the other programs with family planning as well as the local situations in countries where the strategies are implemented. Many projects are still too new to have been comprehensively evaluated and wait the test of time.
Mobile Unit Strategy

Mobile strategies have in the past and still are frequently used for the motivation and delivery of family planning throughout developing countries. Mobile units have received extensive support in the past by USAID funding, especially in the family planning field, but have also been widely used in other rural extension programs. However, this strategy is of dubious cost-effectiveness, and has become somewhat in less favor recently as a basic health development strategy. It is in some ways a remnant of former aid programs which were oriented towards more tangible aid, most notably, infrastructure and equipment.

The mobile unit strategy attempts to alleviate the problem of inaccessibility of local people to family planning personnel and service. Mobile programs can take on many forms, for example, occasional campaigns for motivation or special services such as IUD insertions or vasectomies. These campaigns may be coordinated with special preparation or advance parties in the villages, or better yet, be a part of a continuing program coordinated through the local health worker. The mobile unit strategy need not be confined to jeep transport, but may involve allocation of small motorcycles (for example, in Thailand and Indonesia; Kenny, 1975) or bicycles to the local government midwife or health worker; however, this review we will mainly discuss the strategy that has sent medical/family planning teams by jeep or van into villages to extend services.
The mobile unit strategy has been used extensively for purposes other than family planning. Mobile clinical health services have been offered in many developing countries, while in parts of Francophone Africa mobile preventative services have been utilized (Sorkin, 1976, 86). The extent of mobile strategies in a country's program can be exemplified in the Accelerated Rural Development program of USAID and the Thai government: mobile medical teams which recorded four million patient treatments in about five years (1965-1970) and mobile information teams, mobile development units and mobile trades training schools, all judged of limited worth (Caldwell, 1974, 56-60).

Many countries, such as Indonesia, Malaysia, and Kenya have likewise used mobile clinics to take family planning to the people in the 1970s (Rogers, 1973, 91). India had 728 mobile units, about half of which were used for IUD programs and the other half, sterilizations. Some programs have provided extensive service for most any method of family planning (e.g., see the description of the DANFA program in Ghana, Ampofo, et al., 1976), yet many more are specialized, such as project "extra drive" on the island of Bali in Indonesia which concentrated on IUD insertion. However, the results of most projects have been mixed at best, and the mobile services seem to have proven to be a poor second to locally-based and controlled diffusion strategies. The DANFA program, which was designed to bring mobile teams into experimental areas to deliver family planning and other related services, ironically concluded that inaccessibility of the local population was one of the two major problems with their (mobile)
program, a tacit confession that their mobile program did not solve the problem of inaccessibility. (However, their "mobile strategy" was in some ways more a government health post-centered "mobile strategy." ) Their concluding recommendations advocated, among other things, movement towards community-based distribution and village-based primary care programs (Ampofo, et al., 1976, 273).

In considering mobile strategies, especially when large amounts of equipment and personnel are involved, disadvantages seem to outnumber the advantages. Mobile units are expensive, part of an expensive technology-dependent strategy. In Botswana Walker and Gish (1977) found that the average cost per effective patient contact as compared to fixed health clinics was eight times greater for land mobile units and 14 times greater for light aircraft units. Also, programs can be idled or drastically cut back because of budgetary restrictions on gasoline (e.g., in India, Visaria and Jain, 1976). Service can sometimes be difficult to deliver, for example, for it is recommended to insert IUDs during a woman's menstrual period. Even more importantly, follow-up is lacking, or at best inadequate, with complaints and complications often remaining untended. In India side effects and rumors associated with IUDs were neglected in the government's "loop and run" program, to the detriment of the whole family planning program (Taylor, 1972, 319). Finally, the whole mobile unit strategy is one dictated from the perspective and priorities of the Western-trained and heavy technology-oriented urban medical health profession. Doctors and government health workers can still live in the big modern provincial
and national capital cities, and occasionally take a trip out to the rural countryside, to provide their "contribution" to rural health and family planning. This is obviously an expensive and inadequate solution to improved rural health and family planning delivery.

Nonetheless, certain mobile strategies can be quite beneficial. When combined with an accelerated program in favorable settings, mobile teams have been able to substantially increase program performance. Such was the case with project "extra drive" in Bali which increased acceptance rates 70% in a few months (Astawa, et al., 1975). More importantly, in that field workers have been estimated to spend 1/4 to 1/3 of their working time just walking (Taylor, 1972), small motorcycles or bicycles can considerably increase the number of home visits a local government midwife or family planning worker can make in a day, and concomitantly increase the number of acceptors (e.g., in Thailand, see Porapakkham, et al., 1975). In Thailand home visits increased 42% in a year for midwives with a motorcycle compared to 16% without them (Kenny, 1975). Possibly, mobile units could be used for very special outreach programs requiring scarce skills, to lessen logistical and supply problems, or better yet, for training, as has been the case for mobile sterilization teams in the Philippines (IPPF, 1975, 34). However, taking a wider perspective, mobile strategies have serious drawbacks to consider, most notably in regards to their cost-effectiveness and their lack of compatibility with community-based involvement.
The Camp Strategy

An effective, though seldom used family planning diffusion strategy, is the intensive campaign or camp approach. In contrast to most family planning strategies that remain personal and somewhat low key, the camp strategy puts the family planning program into the spotlight, assembles large groups of people and oftentimes maintains a festival spirit or fair atmosphere. The local level camps can also be considered a partly mobile strategy in that the government usually sends a family planning team to the camp. Almost all of the camp strategies have been developed in India and have been almost exclusively for sterilization. For purposes of comparison, we will discuss the strategies of three different campaigns, including two massive programs which have been well publicized: the Ernakulam District camps (in the state of Kerala), and the Gujarat campaign, a decentralized state effort. The third strategy are the small camps, exemplified by the tubectomy programs for 10-15 women each in Baroda District, Gujarat. The small camps are quite different than the massive campaigns, and most closely resemble mobile unit sterilization strategies.

The Ernakulam campaign (Krishnakumar, 1972) is probably one of the most spectacular "happenings" ever in family planning. In two month-long massive sterilization camps over 78,000 operations, almost all of which were vasectomies, were performed. This included almost 35,000 acceptors from the district or 11.5% of the eligible couples, an increase of the district's total couples protected to 29% with 38.1% of
the women with a parity of three or more protected. This is at least twice the all-India rates. Gujarat state, not to be outdone, less than a year later in 1972 undertook a massive, though decentralized, camp campaign, snatching away Ernakulam's new spot in the Guinness Book of World Records with over 230,000 sterilizations at over 1,000 camps in a short two-months time. This performance was twice any previous year's high for all sterilizations! Both camps relied on strategies of much higher than usual acceptor incentives, 65-75 Rs. in Gujarat and about 100 Rs. in Ernakulam. Also, in Ernakulam a prize lottery was held as an extra incentive. Despite the higher incentives the massive programs were cost-effective, requiring approximately the same expense as a government clinic operation. Both campaigns relied on mass publicity and a fair or festival atmosphere, with cultural events, puppet shows, and the like. Also, both put stress on the importance of good leadership, close government support and efficient management. In fact, the energetic leadership of S. Krishnakumar, the district collector, was credited as the main factor in the Ernakulam success (Rogers, 1973; Valsan, 1977). Both programs seemed to have benefited from synergistic effects of massive coordinated efforts and diverse entertainment activities. Indeed, such effects appear to be an important strength of this sort of diffusion strategy.

Thakor and Patel (1972) commented on some of the differences of the two campaigns. The most noticeable was the decentralized approach in Gujarat which contributed to smaller transport costs, wider coverage of the population, and a greater diffusion of information, a point which
might be challenged. Also, because the camps were smaller, it was easier "to bring family planning into the immediate life of the family," and provide more comprehensive motivation, education and publicity.

Bhatt and others' (1978) review of the small female sterilization camps for 10 to 15 women at a time in Boroda District, Gujarat from 1972 to 1975 points out the strengths of smaller programs. Complication rates were quite low and postoperative care and follow-up were better, while the small group seemed to lend itself to a more personal atmosphere. Also, the primary health care facilities offered a more comprehensive family planning service, more integrated into community and health activities. Finally, the small camps offered good training experience for the local staff. Of these points, the better quality of care and personal atmosphere seem to be the more persuasive arguments for the small camp strategy.

The camps, especially the massive camps, have received a great deal of criticism, both pro and con. The large number of acceptors cannot be discounted: fantastic efforts have been made. However, the quality of service was at times not up to standards (Valsan, 1977). This, along with a few related deaths from tetanus, caused adverse publicity. Also, the quality of the acceptors in terms of demographic characteristics was not well controlled: for example, the median age of men at the massive camps of 38.2 fares well with all-India rates, but suggests a fairly large number of questionably older men (see Table B.1). Also, a legitimate criticism is that the camps had adverse effects on the
performance of the regular family planning program for the rest of the year (Valsan, 1977). Furthermore, camps during the second year did not yield results similar to the first year. Because of these reasons and also budget cuts, mass vasectomy camps were discontinued in 1973/74. Nevertheless, their experiences have left us with an example of a more daring program strategy which can diffuse family planning to large numbers of people over short periods of time.

**Locally-Based Distribution**

Growing out of the shortcomings of traditional family planning program efforts, community and commercial-based distribution systems are becoming the most advocated solution to problems of inaccessibility. The use of non-medical resources to promote and distribute contraceptives, most notably conventionals and pills, is viewed as an inexpensive and reliable strategy to increase the present availability of family planning. Although a few projects were implemented in the early 1960s, interest only has focused on this strategy since the last half of the 1970s. In a comprehensive inventory on community-based and commercial contraceptive distribution projects, Foreit and his colleagues (1978) detailed 83 non-clinical projects in 36 developing countries, 70 of which were established between 1974 and early 1978. Both the International Planned Parenthood Federation (IPPF) and USAID have shown keen interest in this delivery approach (Cuca and Pierce, 1977a).
Table B.1. Mean Age of Husband and Wife, and Number of Living Children for Acceptors in Selected Sterilization Programs, India.

<table>
<thead>
<tr>
<th>Location</th>
<th>Age of Husband</th>
<th>Age of Wife</th>
<th>Living Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ernakulam</td>
<td>38.0</td>
<td>31.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Gujarat</td>
<td>38.2</td>
<td>33.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Baroda</td>
<td>N.A.</td>
<td>30.0*</td>
<td>4.3</td>
</tr>
<tr>
<td>All-India</td>
<td>35.7-44.1</td>
<td>30.4-38.0</td>
<td>3.4-5.4</td>
</tr>
</tbody>
</table>

*Median age

Sources: Krishnakumar, 1972; Thakor and Patel, 1972; Visaria and Jain, 1976.
These strategies to make contraceptives more universally available have come only with slow acquiescence of the medical profession. The medical orientation of family planning programs have made them appear somewhat incompatible with a marketing approach. Medical skills are usually sought and hence have not had to be actively promoted (Harvey, 1973). Oral contraceptives have often been limited to official medical channels. Surveying oral prescription requirements in 45 developing countries, Black (1974, 251) concludes that "the legal limitation of the pill to an only-on-prescription basis serves no apparent medical or social purpose....In practical terms they appear to restrict distribution to the limited medical and licensed pharmacy networks" denying access to the rural, the remote, and the poor. It is curious "that even in countries without a prescription law, commercial pill distribution is largely confined to licensed pharmacies (Black, 1974, 253). Black shows the debate over whether oral contraceptive prescriptions are desirable is largely academic: only in five of the surveyed countries is the pill never available without prescription.

In a theoretical diffusion framework, locally-based distribution fits appropriately in what Brown (1978) terms "the market and infrastructure context of diffusion of an innovation." Marketing concepts are belatedly making marked inroads into the diffusion of family planning, with such ideas as segmentation of the market (Simon, 1973), encouragement of the use of marketing research organization (Smith, 1973), and social marketing (Black, 1976; Black and Harvey,
1976; and Davies and Louis, 1977), and working with existing
distribution networks.

Locally-based distribution, because of the comprehensiveness of the
term, seems to be the most appropriate catchword for the family planning
delivery strategy presently being discussed. However, a whole slew of
concepts have been used: 1) the "inundation" approach (having the
somewhat negative connotation of an uncontrolled flood of
contraceptives), 2) community-based distribution (implying the use of
local people as distributors), 3) commercial-based distribution (with
stress on the private marketing side), 4) social marketing (the use of
marketing techniques and resources to further social as distinct from
commercial objectives, Kotler and Zaltman, 1971), 5) household
distribution and 6) commercial distribution.

Because locally-based distribution is concerned with distributing
or selling contraceptives, it is reserved to certain methods: condoms,
spermicides, more controversially, the pill, and possibly in the future,
the injectable. Many schemes rely on a reasonable profit for the
seller, others have volunteers distribute for free, and yet others call
for government price subsidy.

Locally-based distribution strategies carry many advantages over
the traditional clinic-based approach to family planning. Several of
these advantages are similar to those already discussed for paramedics.
Most importantly these strategies are cost-effective and can be
implemented through an extensive distribution network already in
existence while requiring little additional infrastructure or expenses.
The Preethi (1974) and Nirodh (1973) condom social marketing schemes provided a couple-years of protection for US $8.46 and $1.78, respectively. This quite favorably compares with cost per acceptor for national family planning programs, which range from approximately $6 to $45 and average about $12 (Castadot, et al., 1975, quoting statistics from Nortman, 1973). An extensive network of potential distributors is available: limited data does suggest there is probably one store of some kind for every 25 to 120 fertile couples (Black, 1976, 201) and the cost-consciousness of the little guy makes for efficient use of resources. Also, the private commercial sector is geared toward the consumer, an approach often sadly lacking in the government family planning clinic. Finally, along with involving small village shopkeepers, locally-based distribution most significantly generates grassroots involvement, localizing and normalizing contraceptive delivery (Black and Harvey, 1976).

Criticisms of the locally-based approach are not too convincing. They argue that turnover of local volunteers and storekeepers makes for inefficiencies and intermittent supply, lack of medical supervision can be dangerous, and that by commercializing contraceptives, no matter how low the price, the poor will be denied. The first criticism appears only to partly hold true and the second can be overcome by the precautionary checklist procedure previously advocated for paramedics, or an initial resuppliable prescription from a medical worker. As for the dangers of the pill, they appear negligible compared to the high rates of maternal mortality associated with pregnancy. Lastly, although
cost has not been found to be an important factor, the poor can be aided if necessary by a coupon system of government support.

Locally-based distribution programs might be broken down into four general approaches. First, there is the private commercial system, made up of drugstores and small shops, which can operate on its own. The second approach is social marketing which relies heavily on commercial marketing techniques and government subsidy. Examples of this type of program are the condom distribution schemes in India (Nirodh), Sri Lanka (Preethi) and Kenya (Kinge). The third approach, community-based distribution, is more broadly based in the community, often using volunteers outside of the private commercial sector. Examples of this are the Profamilia Rural Family Planning Program in Columbia, the community-based free distribution system for oral contraceptives in northeast Brazil and the privately operated Community Based Family Planning Services (CBFPS) in Thailand. The fourth approach might be termed the specialty dealer, typified in the ingenious scheme to use the Jamu private marketing organization in Indonesia.

The Private Commercial System

The first approach, the private commercial system, has provided an important distribution service over the years, often in the absence of any government program or other effort. Mainly through drugstores, but also smaller outlets, and working under the profit motive, the commercial system has made family planning available to the public. Condoms have been their most usual product, but also other conventional
and pills are sold, sometimes with prescription, often many times without. The private drugstore system has been a major supplier of family planning both in the developed and developing countries. It has been estimated that over 40% of the family planning supplied in developing countries, despite the emergence of large national programs, is through the private system. However, "unfortunately, government family planning programs usually act as though the commercial systems were not there" (Rogers, 1973, 354). It appears that it should be necessary to take the private commercial system into account when planning delivery strategies and considering the total national family planning program. Nevertheless, ministry of health programs sometimes even fail to account for other family planning activities within the government sector itself, much less completely private activities. More official interest should be forthcoming, for the beauty of the commercial market system is that to the government it is free, and to the extent that the market system is working efficiently and equitably, government involvement need not be required.

**Social Marketing**

The second local distribution approach, social marketing, has been attempted in over 30 projects in 27 countries. Approximately a dozen of these projects are major efforts, the most successful in Jamaica, Thailand, Columbia, Sri Lanka, Bangladesh and India (Altman and Piatrow, 1980). Social marketing involves both governmental inputs and the use of marketing techniques and the private market system. Organization is
along the lines of a consumer sales organization (Repetto, 1975a) with a small management cadre which coordinates and contracts private specialist agencies for research, promotion and distribution (Black, 1976). Market surveys may be contracted to decide on what kind of a market to concentrate on and what sort of advertising campaign to use or what sort of product name and packaging are best. In preparation to marketing condoms programs have market-tested new product names to promote a "cleaned up" image. The crucial link in the program is the consumer product distributors who channel the contraceptive nationally from wholesalers to village shops (Black, 1976, 201). The price of the condoms has been substantially subsidized by governments so as not to be prohibitive to the poor.

Several programs have been relatively successful, and show signs of becoming more cost-effective than most other delivery strategies. Condom users in India jumped from seven million before the Nirodh program in 1966 to 116 million in 1973 after the program had been in operation for five years. In Sri Lanka there was a five-fold increase in three years (Black and Harvey, 1976). Success in Sri Lanka with Preethi led to the test marketing of Mithuri, an oral contraceptive, in 1975. Both have steadily increased in sales from 1976 to the present (Altman and Piatrow, 1980).

The impact and cost-efficiencies of the major social market programs can be seen in Table B.2. Costs per couple-year of protection (CYP) varies from about one to five dollars, a quite moderate level. If we consider the percentage of couples protected, the programs show an
impact, be it modest relative to the total national program. Despite progress, problems have been encountered in social marketing programs. The Indian Nirodh condom program, probably the largest social marketing program, lost almost half its sales in 1974-75 after the promotion budget was cut and prices raised. Sales have only recently climbed back up to the 1973 levels (Altman and Piotrow, 1980). In other countries social marketing programs have failed for a variety of reasons, such as the lack of adequate funds and support, poor management and inadequate advertising.

Community-Based Distribution

Of the more broadly based community-based distribution programs, probably the Profamilia Rural Family Planning Program in Columbia is the best known. Started in 1970 it was the first large scale rural family planning program in Latin America (Echeverry, 1975). In 60 counties (in six states) the condom, pill, and spermicides were distributed to homes by volunteers who were selected from the "natural leaders" of the villages. Evaluation of the project showed a good performance with high continuation rates and a coverage of 16-21% of the eligible women (Bailey and Correa, 1975).

The Brazilian project in Rio Grande do Norte, one of the poorest states of the Northeast (and with a reported crude birth rate of 52/1,000), was similar to the Columbian program. The program had strong support from the governor and mayors. A decentralized group of volunteer distributors, respected persons recruited by the mayors,

<table>
<thead>
<tr>
<th>Percent of Couples Protected</th>
<th>Cost per CYP (in U.S. $s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia</td>
<td>4.7</td>
</tr>
<tr>
<td>Thailand (urban)</td>
<td>0.5</td>
</tr>
<tr>
<td>India</td>
<td>1.2</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>6.1</td>
</tr>
<tr>
<td>Thailand (rural)</td>
<td>5.3</td>
</tr>
<tr>
<td>Jamaica</td>
<td>6.6</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>3.3</td>
</tr>
</tbody>
</table>

*excluding revenues and cost of contraceptives.

Source: Altman and Piotrow, 1980.
consisted mainly of women, who were teachers, community leaders, primary health workers, and local midwives. The program seems to have been well received and fairly successful, attracting 111,660 new clients or about 30% of the women of childbearing age from 1973 to 1978 (Gorosh, et al., 1979). However, after the first two years, pill prevalence rates plateaued at 10 percent, suggesting the possible need to add methods other than the pill to the program. Nevertheless, drawing on the experiences in Rio Grande do Norte, similar programs were initiated in neighboring states (Davies and Rodrigues, 1976).

A third program receiving some publicity is the Community Based Family Planning Services (CBFPS) program in Thailand. Begun with IPPF support in 1974, this program owes at least part of its success to its charismatic leader, Mechai Viravaidya, who has been so convincing a promoter that the condom is commonly referred to by his name. The backbone of the CBFPS is the training and supplying of local personnel who motivate the local people, sell condoms or pills for a small profit at small stores or outlets, and deliver them to peoples' homes. The distributors, who are also motivators, are mainly farmers or shopkeepers. The program is on a fairly large scale now, operating in 60 districts (about 10% of the national total) and 5,700 villages. The program appears quite successful, but independent outside evaluations of the program have estimated the CBFPS program impact to be a good bit less than in-house estimates (Porapakkham, et al., 1979; Day and Leoprapai, 1977).
Several projects in locally-based distribution have been undertaken in Bangladesh. In 1976 the Ministry of Health initiated a one-week nationwide house-to-house distribution of oral contraceptives and condoms. This project, however, appeared to only slightly affect the contraceptive use rate. A household distribution project developed at about the same time by the Cholera Research Laboratory for 150 villages in Matlab thana succeeded in raising the contraceptive use rate from 1% to 17.8% at three months, although there were problems with continuation. Their success was probably accountable to the better organization and management of the Cholera Research Laboratory as well as the respect it held in the community. However, as use dropped off in time, the program was revised in 1977 to include a full range of contraceptives other than the pill. In addition, female village workers were hired for outreach support. This program resulted in both high acceptance (39.2%) and continuation (81.2% one-year continuation) rates. Other experimental projects have been undertaken in Bangladesh, for example one emphasizing both community support and delivery in a to Save the Children Federation project and another using social workers and primary school teachers as volunteers in a Bangladesh Family Planning Association project (People's Republic of Bangladesh, 1978). In Bangladesh it appears that community-based distribution can be successful; however, higher usage and continuation rates are contingent on good administrative and organizational support.

Finally, there have been other notable community-based distribution efforts. It appears no Third World country has yet to approach the
effectiveness and comprehensiveness of the tightly organized, nationwide community-based distribution system of the People's Republic of China, which is sometimes held as an international model. In Korea there have been pilot projects in Cheju (Hong and Lee, 1979) and Euiryong, the latter increasing the use of modern contraception one-third (Park, et al., 1977). In Egypt household distribution of pills in 38 villages increased contraceptive prevalence from 19.1% to 27.7% (Gadalla, et al., 1980). Other project successes in other countries could be mentioned; however, the success of this strategy cannot be denied. The larger question which remains is whether it can be implemented and organized successfully on a national scale.

The Specialty Organization

The last type of locally-based distribution approach, the specialty dealer or organization, can be seen in the unique Jamu marketing scheme for condoms (Karet KB) in Indonesia (Piet and Hendrata, 1974). This approach uses a modern business organization whose products are traditional herbal medicines, many of which promote sexual well-being (like virility) and health. The Jamu marketing system is widespread, an interesting blend of the modern and the traditional, and distributes through a varied network of outlets from big shops, mobile vans, to cart vendors. The program, started in 1974, has great promise as being the "most effective means of marketing condoms in Indonesia" with its stress on concentration on the "male market" and its grassroots distribution networks (East-West Communication Institute, 1975).
Conclusion

The locally-based approaches, although holding out promise, have yet to make much of a substantial nationwide impact in family planning diffusion. This is especially true of the condom social marketing schemes. In some cases subsidized commercial condoms did little more than drive the competing more expensive private brands off the market (e.g., in Columbia, Bailey and de Zambrano, 1974). Also, marketing advocates must remember that diffusing family planning is not just like marketing another product. An elaborate social marketing scheme for condoms in the Philippines got completely and unexpectedly brought to a grinding halt before getting off the ground by the morals-conscious Catholic Women's League (Roberto, 1977).

It is yet premature to judge the effectiveness of the many public sector experiments in locally-based distribution of family planning, but several do not look as promising as their proponents see them, especially some social marketing programs. Nevertheless, the effectiveness of the commercial private system has been proven, and despite its limitations, carries on day by day regardless of most government programs.

Other Strategies and Strategy Facilitators

Besides the strategies already mentioned in this section of the paper, we will briefly discuss other family planning delivery options in
passing in an attempt to be more inclusive. We will first look at other strategies which have not been discussed within the seven categories of strategies in this chapter, many closely tied to the private sector. Second, we will detail approaches which can accelerate the effectiveness of specific delivery strategies. These approaches have been labeled as "strategy facilitators" and broken down into four categories of: 1) special program/methods, 2) mass media, 3) pricing policy, and 4) incentives/disincentives.

Other Strategies

Alternative delivery strategies that we have not already mentioned include distribution through the mail, use of a government agency unrelated to the national family planning program, use of the private industrial sector, and delivery through the private medical sector. Mail order, mainly for condoms, is quite prevalent in the West, and has been tried with moderate success in some developing countries, such as Sri Lanka. An important aspect of this strategy is that it guards the anonymity of the buyer, if that is an important consideration. A second strategy, use of a government agency not related to the national family planning program, is exemplified through the Korean program which motivated and recruited vasectomy acceptors during their army reserve training (Republic of Korea, Ministry of Health and Social Affairs, 1979).

Another strategy is for the public sector to encourage family planning activities within the private industrial and commercial
sectors. Social marketing schemes can be large-scale joint efforts. In India the Nirodh condom distribution program involved cooperation between the government and the six largest commercial concerns in the country which managed the distribution aspects of the program. Also, in India private industry has been responsible for the innovative tea-estate non-birth incentive programs (Ridker, 1971, 1980), while Tata Industries has offered cash incentives and free hospitalization for employees or their spouses who undergo sterilization. According to a sample survey of the Employers' Federation of India, well over half of the manufacturing firms and nearly all the plantations provided family planning (Visaria and Jain, 1976, 34).

In Japan since the early 1950s industrial companies have been closely involved in family planning. Companies employ one licensed midwife for every 800 families with the responsibility of family planning motivation, training and distribution. There are about 40,000 of these outreach-oriented midwives in Japan, supported by the private sector at ten times the expense of what the national government family planning budget is. The successful program has played a notable role in increased contraceptive use and falling fertility and abortion rates (Aoki, 1976). Japan's industrial sector is among the most active in the world and could possibly serve as an example for possible strategies for certain Third World countries today.

Lastly, some governments have opted for a laissez-faire approach to the delivery of family planning. Such a "non-policy" entails a number of strategies by default: delivery of family planning through private
doctors and hospitals, private organizations such as planned parenthood, or commercial distribution centered on drugstores or a wider network. The mix of actual strategies that evolves depends on the individual country situation and the amount of restrictions the government places on the possible family planning activities of the private sector.

**Strategy Facilitators**

"Facilitators" to the delivery of family planning are not complete delivery strategies themselves but rather are designed to augment the effectiveness of a delivery strategy. They can affect the whole family planning program in general or be method-specific. Effectively used, they can accelerate the rate of acceptance and increase the motivation of the people. In short, they are "demand-creating" aids to a family planning marketing strategy. "Facilitators" will be considered under the four general categories of special programs/methods, mass media, pricing policies, and incentives/disincentives.

There are many special methods and programs which can accelerate the use of family planning. Good examples are the birth control information programs and mailings in Taiwan which contact new couples just upon marriage and new mothers just after registration of a new birth. Such programs rely on informing prospective users at opportune times. Another special program is the organization of Mothers' Clubs to spread information about and encourage the use of family planning while participating in other social activities. The best known example is the network of over 27,000 Mothers' clubs in Korea (ESCAP, 1975; Republic of
Korea, Ministry of Health and Social Affairs, 1979). Of similar design and intent are the Fathers' Clubs in Ghana (Ampofo, et al., 1978). General telephone services in the large cities of Seoul and Taipei offering information, counseling, and referral have been shown to be an effective, yet inexpensive, way to reach large numbers of people not availing themselves of the existing delivery system (Cernada, et al., 1974).

The use of mass media to facilitate the diffusion of family planning has been extensively researched and written about. It has been a major thrust of several national family planning programs and the main focus of research of the East-West Communication Institute, as well as a main interest of several well-known researchers, including Donald Bogue and Everett Rogers. Mass media is mainly involved with the dissemination of information about family planning through newspapers, magazines, movies, radios and television. More recently, traditional mediums, such as puppet shows and drama, have also been successfully used. Mass media has been considered by many to be a main ingredient of a family planning diffusion strategy, although its importance has been debated by others. It has been more successful in informing people about family planning availability rather than persuading them to actually adopt (Rogers, 1973). Interestingly, Verbrugge (1978) reports mass media to have been more effective in Malaysia indirectly through reinforcing important and vocal communicators who then more often encourage later acceptors. The Isfahan (Iran) Communications Project in 1970 and the Kaohsiung (Taiwan) in 1967 are two examples of intensive
mass media experiments which increased usage of family planning at reasonably low costs and therefore spurred greater government expansion in the use of mass media.

The pricing of different contraceptive methods can play an important role in family planning delivery strategies. Prohibitive prices may prevent potential acceptors from adopting, an important consideration for the rural poor, especially those from a largely non-monetized economy. Large variations in price may lead to one method of birth limitation being chosen over another. In the same vein, the government must decide whether free family planning service is the most cost-effective way to increase the numbers of users. How many free condoms get tossed away, never used, or perhaps blown up into balloons? 

Mamdani (1972, 33) recounts the fascinating story of an Indian couple with a more artistic bent who had taken free pills from the Khanna Program and stacked them up into geometric designs in the corner of a room. Besides the waste that accompanies free distribution, village people also may consider an item which is free is not worth much and would rather have a superior product which is paid for. Despite free pills distributed through the government program in Thailand, a sizable portion of pill users (21%) buy their pills at drugstores for the rather expensive market price (Westinghouse, et al., 1978).

Government can affect pricing through various means, such as subsidies, domestic manufacture of contraceptives (for example, India manufactures its own condoms) or altering import duties on contraceptives or materials. Little research has been done on the
actual pricing of family planning services outside of the Taiwan experiments (Cernada and Sun, 1974) on pricing pills and limited-time free offers on IUD's (which doubled acceptance). In the fall of 1975 in Thailand when government pills were made available for free (from a previous cost of 25¢/cycle) no experiments before or evaluations after were undertaken to determine the efficacy of the policy changes, despite some controversy over the move.

The last "facilitator" to delivery strategies we will discuss is the use of incentives and disincentives. This is a complex and important planning option, considerably argued and written about by experts. Rogers (1973) has suggested in a classification scheme the variety of considerations incentives may cover. His typology includes adopter versus diffuser incentives, individual vs. group, positive vs. negative, monetary vs. nonmonetary, immediate vs. delayed, graduated vs. nongraduated, and contraception vs. non-birth. It is generally accepted that incentives have a positive effect in the diffusion of family planning although their ethical acceptability and cost-effectiveness may be argued. The especially high adopter incentives used for the intensive camp strategies were the subject of some controversy. Throughout this review we have discussed incentives, especially monetary incentives in relation to different diffusion strategies and although we will not further detail the different types of incentives, two rather ingenious non-birth incentive schemes merit attention. These two non-birth incentive schemes offer delayed benefits to women for not having more than a specified number of children. On
the Indian tea estates companies put a set amount into a joint bank account every month, the total savings bond to mature on a woman's forty-fifth birthday. Progressive forfeitures were placed with the third or greater pregnancies, all being forfeited with the birth of a fifth child (Ridker, 1971). A similar plan was put into effect in Taiwan except that the savings bonds were redeemable only for post-elementary education of children in two or three child families (Wang and Chen, 1973). In a recent evaluation Ridker (1980) reported the tea estate program as a guarded success and recommended continuation and further experimentation. Compared to two control groups, the experimental tea estates witnessed sharper declines in fertility. However, the program results were not particularly dramatic due to administrative mistakes, and often after a few years over half the women could not recall any of the original conditions of the program. The rationale of these programs is predicated on being able to view their family-size decisions in a long-term context. Therefore, in which cultures these non-birth incentives may prove feasible is an important consideration. Finally, the use of legal disincentives and incentives can be a powerful tool to facilitate fertility control and hence family planning acceptance. The legal disincentives of Singapore are quite comprehensive (Anderson, et al., 1977; UNFPA, 1976); however, these policies will not be discussed in detail in that they are somewhat tangential to the main topic of the review, that is, family planning delivery strategies.
Concluding Observations

Family Planning Delivery Strategies in a Mobility Context

To get a better understanding of how these seven delivery strategies relate to each other, we might look at them in a framework of place-orientation, that is, in a geographical or situational perspective. If we take the viewpoint of the supplier (or diffusion agency) of family planning, a delivery strategy will involve our taking family planning, the innovation, to the potential adoptor, the consumer, or his coming to us for service. From this perspective the supplier can choose either a mobility strategy or a place-oriented strategy, seen as parts A and B respectively in Figure B.1.

There are basically two types of mobility strategies: use of mobile teams and extension workers (or "field workers" to use the more common title). Mobile teams usually work out of provincial capitals or larger cities, with jeeps or sometimes mobile vans to bring family planning to the rural areas, often areas of poor accessibility or those lacking in services. Mobile teams also operate in conjunction with smaller health centers, using them as a base for special campaigns for vasectomies, tubectomies or IUD insertions. Field workers go out into the community on foot, but also sometimes using motorcycles, bicycles or public transport to make home visits to encourage women to come to government clinics for family planning. These strategies are active, in the sense that they try to create demand.
Figure B.1. Delivery of Family Planning: Mobility and Place-Oriented Strategies for the Policy-Maker.

A. Mobility Strategies
1) Mobile Teams
2) Field Workers

B. Place-Oriented Strategies
3) Integrated (e.g., Postpartum Programs
4) Camps
5a) Hospitals
5b) Clinics
6a) Paramedics (with expanded or limited role)
6b) Non-government Paramedics (with extended role)
7) Locally-based Distribution

urban
high cost
more infrastructure/equipment
less units (facilities or distribution points)/area
more service capacity at each unit
more impersonal service
greater professional skills of staff

rural
low cost
less infrastructure/equipment
more distribution points/area
smaller service capacity
less impersonal service
less dependence on skilled staff
On the other hand, place-oriented strategies are bound to one place and require that the consumer seek them out. On the left side of the diagram, there are the strategies which require potential family planning adopters to come from all distances, short and far: integrated programs, camps, and hospital/clinics. In that (integrated) postpartum programs and camps are somewhat of a more special nature (often temporary or reserved to a few special facilities), we have set them above the others, so to more closely observe the interrelations of the remaining strategies.

We can envisage strategies near the lefthand side of the page to be associated with urban areas and serving large areas, and those on the right with very rural areas and small catchment areas, with gradations within. As we go from left to right, there are the strategies associated with hospitals, clinics, clinics staffed by paramedics with an expanded role (that is, they can dispense family planning without a doctor's supervision), paramedics with a limited role, non-government paramedics with an extended role (e.g., local midwives who are trained to insert IUDs), and locally-based distribution schemes. Moving from left to right again, we can see that the strategies require progressively less special infrastructure, are less costly, less dependent on sophisticated medical expertise, provide greater accessibility with more outlets and more personal service. Going from right to left we see strategies requiring higher costs, more infrastructure, greater medical expertise, having fewer units and thus requiring longer travel for the consumers, and worse accessibility and
lesser personal service. We therefore have a continuum, from a highly centralized system to a highly dispersed system. This also can be viewed as generally corresponding to a rural-urban continuum.

What does this all suggest? The medical establishment, medical doctors and higher public health officials (the power and policy people) have always been for the most part urban-oriented and more favorable to the strategies on the left: hospital, urban-centered, technology dependent strategies. As we go from left to right the strategies meet with their greater disinterest. This is most likely due to two principal reasons. First, physicians wish to remain urban-oriented preferring the amenities and greater financial benefits of the city. If they must work in the countryside, they opt for a mobile team which can whisk them out to the countryside to do their duty while allowing them to live in the city and keep their lucrative private practice. Second, dispersed strategies usually lessen the physician's control over health and family planning delivery. Nor would they want to oversee such a strategy either, for that probably would require trips to the rural areas. Therefore, we can see the interests of the medical/health elite is in opposition to the interests of the rural people. Traditional and not highly mobile, the countryside peoples prefer the smaller, more personal family planning outlets closer to home. Such rural-based, more dispersed schemes, there is reason to believe, can also be more cost-effective for a national family planning program. Nonetheless, such policies have been, and will continue to be very slow in coming, for it is doubtful that the medical/health elite will make decisions contrary to their own interests.
In reviewing supply-side options to facilitate the adoption of family planning, the experimental and ongoing delivery strategies of Third World governments have been classified into seven categories. The earliest strategy, and the base of most Third World national family planning programs today, is the hospital/clinic strategy. Working out of public health infrastructure or sometimes their own special family planning buildings, this strategy used alone is often dependent on a highly motivated population for success. Because of this, many countries have supplemented the hospital/clinic infrastructure with clinic extension programs. Outreach into the community through an assortment of field workers and home visitors has found mixed success in creating demand and improving the accessibility of the population. Family planning programs also found it possible to recruit more acceptors through integrated programs. Most important were the hospital postpartum programs which could reach recent mothers, an important target group. A second and less important type of integrated program was the many other government programs, for example, integrated rural development, that combined family planning with other activities. These three major strategies used together have found favor, and now it is not uncommon to find the three combined together in a country's ongoing national family planning program.

Two of the strategies reviewed, the use of camps and mobile units, are of less importance. The camps, with their large-scale festival-like
atmosphere, have been almost exclusively associated with the sterilization campaigns in the early 1970s in India. In some ways, the most "innovative" (or at least most daring) of strategies, the camps' successes were offset by the risk of improper sterilization operations or unsatisfied clients and a consequent backlash of rumors which could and did on occasion occur. The mobile unit strategy, though championed by some foreign donor agencies and extensively used around the world, most likely will become progressively less important as the price of fuel increases to the point of being prohibitive for large-scale mobile operations.

The last two strategies, the increased use of paramedics and locally-based distribution schemes, appear to hold more promise for the future. They seem cost-effective, making use of existing local resources and not being highly dependent on expensive infrastructure. Moreover, they allow for greater input on the grassroots level. The extent to how much these strategies are realized is in part contingent on the decisions of family planning administrators. Whatever the decisions, it appears that a greater diversity of strategies to deliver family planning will be a part of future programs, as well as possibly less centralized government control.
Appendix C.1

QUESTIONNAIRE FOR THE SURVEY OF THE LOCAL POPULATION

Date Given: February - April, 1977
Sample size: 2,110 households
Survey site: Suphanburi Province
Survey organization: Institute for Population and Social Research, Mahidol University, Bangkok
Language: Administered in Thai

Note: Besides the interview questions translated below, there are also the coding categories for open-ended questions. These coding categories were drawn up after the survey.

A. General Information

Each respondent (questionnaire) was assigned a unique identification code based on place of residence. This hierarchical geographic code denotes the district ("amphoe"), township ("tambon"), and village area ("muban") respectively, as well as gives a distinct number code to each respondent in a village. The listing of the nine districts, 95 townships (and two municipalities), and the 197 village areas which were surveyed can be found in Codebook: "Muban" Listing and Code Listing for all Changwats and Amphoes Thailand: 1975.

A.1 Respondent

Male, head of household
Female, wife of head of household
Female, head of household
Son, Daughter, or relative of head of household

A.2 Village area ("muban") number

A.3 Age of respondent

(Calculated in years from the animal year of the respondent or taken as his stated age.)
A.4 Marital status of respondent

Married (once)
Married more than once
Divorced
Separated
Widowed
Single

A.5 Number of years married

A.6 Place of Birth:

Province

District

(Place codes can be found in Code Listing for all Changwats and Amphoes Thailand: 1975.)

Township

(Place codes for Suphanburi are found in Codebook: Muban Listing.)

A.7 How long have you lived in this muban (in years)?

A.7.0.1 Urban/rural status:

<table>
<thead>
<tr>
<th>designation</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>All municipal area residents</td>
</tr>
<tr>
<td>Urban periphery</td>
<td>Villages on the road within five kilometers of the Changwat center</td>
</tr>
<tr>
<td>Semi-urban</td>
<td>Within a &quot;Sukabiban&quot; (small market town)</td>
</tr>
<tr>
<td>Semi-urban periphery</td>
<td>Contiguous or very close villages to a &quot;Sukabiban&quot;</td>
</tr>
<tr>
<td>Rural</td>
<td>All remaining respondents</td>
</tr>
</tbody>
</table>

A.7.1 Have you lived in this muban all of your life?

A.7.2 How long have you lived in this tambon (in years)?
A.8 Migration record: In the past ten years where have you lived?
(Order three places of longest residence.)

<table>
<thead>
<tr>
<th>Municipal</th>
<th>Amphoe</th>
<th>Status</th>
<th>Duration</th>
<th>Seasonal Migration</th>
</tr>
</thead>
</table>

8.1 Most recent previous residence

8.2 Next recent previous residence

8.3 Third most recent previous residence

For the key to geographic residence codes look in Code Listing for all Changwats and Amphoes: Thailand, 1975.

A.10 Principal occupation of the head of household

Primary economic activity: agriculture

- Wet rice farmer
- Dry crops farmer
- Animal (husbandry) farmer
- Farm laborer (hired)
- Farmer of both rice and dry crops
- Vegetable garden farmer
- Fruit farmer
- Farmer of both fruit and wet rice

Primary economic activity: other

- Fisherman

Skilled or semi-skilled laborer

- Carpenter, plumber, skilled construction worker
- Mechanic or skilled repairman
- Semi-skilled or skilled factory worker (e.g., dressmaker)
- Cottage industry (e.g., silk weaving, basket making, dressmaking at home)
- Heavy equipment operator
- Craftsman (e.g., goldsmith, potter, metalworker)
Unskilled labor

Unskilled construction laborer
Unskilled factory worker (wage worker with little skill)
Unspecific unskilled laborer ("other labor" not including farm labor)

Services: sales

Shop owner, or spouse of owner
Salesman in shop
Vendor (from boat, cart or shoulder)
Small shop owner

Services: skilled

Government worker, specifically administrator
Teacher
Businessman, factory manager
Barber, beautician
Entertainer, musician
Policeman, fireman
Typist or skilled office worker
Injection doctor
Clerk, office worker for government

Services: non-skilled or semi-skilled

Housekeeper or cook
Driver
Janitor, watchman
Military serviceman (non-career)

Miscellaneous

Other
Don't know
Unemployed (e.g., housewife)

A.11 Secondary occupation of head of household

(Coding key in A.10)
A.12 Education of head of household

Educated but cannot classify
Never went to school
Completed 1-3 years
Completed 4 years
Completed 5-7 years
Completed 8-11 years
Completed "maw saw" 4-6 (vocational school)
Three-year college diploma
College graduate or more

A.13 Age of spouse of respondent

(Coded in years; calculated from animal year or taken as stated age.)

A.14 Occupation of spouse

(Coding key in A.10.)

A.15 Number of children-ever-born (for women)

A.16 Current fertility: \( \Phi \) of children-ever-born in the last two years

(This information was obtained by asking the age of the youngest child. If he was one year or less, then the age of the next youngest was asked to ascertain if he was less than two years old. Then the total number of children were coded.)

A.17 Number of living children

A.18 Number of persons in the household, including those temporarily residing elsewhere.

A.19 Members of the household

A.19.1 Number of household members in the nuclear family

A.19.2 Other relatives in the household

A.19.3 Others in the household who are not related to the family

A.20 Do you or your spouse read the newspaper?

A.20.1 About how often (times/month)?

A.21 Do you or your spouse read magazines or books for pleasure?
A.21.1 About how often (times/month)?

A.22 Do you or your spouse listen to the radio?

A.22.1 About how often (times/month)?

A.23 How many rai does your (nuclear) family own?

(One acre = 2.5 rai.)

A.24 How many rai do you farm (including rented land)?

A.25 What do you mainly farm?

- Rice
- Rice-double cropping
- Rice and sugar cane
- Rice and fruits
- Fruit orchards - other
- Fruit orchards - mango
- Fruits - mango and coconut
- Fruits - watermelon
- Fruits - coconut
- Fruit - sapota and banana
- Fruits - more than 2 thirds
- Fruits - banana and papaya
- Other fruits
- Vegetables - more than one variety
- Vegetables - kale
- Vegetables - potatoes
- Vegetables - peppers
- Vegetables - beans
- Others, not specified
- Corn
- Cassava
- No answer
- Inappropriate (No land)

A.26 What is the source of water for your household?

- Stream
- Well or man-made pond
- "Klong" (canal or stream), Government canal for irrigation
- River
- Natural spring or pond
- Piped water
- Mechanical well
- Several sources
- Rain water
- No answer
A.27 Does this village have electricity?
A.28 Does this house have electricity?

B. Illness Response Behavior

B.1 In the following series of questions, we asked two questions about each medical service provider:

1) **Do you or your family ever use any of the following services or personnel for medical care?**
2) **For what purpose/disease?**

(Coding key found after listing of questions for B.1.)

**Question # and Medical Provider**

1.1 **Drugstore**
1.2 **Traditional doctor** (including "monk doctor")
1.3 **Spirit doctor** ("maw pi")
1.4 **Granny midwife**
1.5 **Injection doctor** (not an official government doctor)
1.6 **Tambon doctor** ("Pheet pracham tambon")
1.7 **Government public health worker**
1.8 **Medical doctor** (i.e., with a full medical degree from a university)
1.9 **Midwifery center**
1.10 **Second class government health center**
1.11 **Medical and health center**
1.12 **District hospital**
1.13 **Private clinic**
1.14 **Private hospital**
1.15 **Government hospital**
1.16 Mobile clinic

* Note: 1.11 was a government classification for a type of former first class center (district hospital); this classification (name) was unknown to most of the respondents.

Code for Disease/Illness/Medical Care

I. Common minor illnesses (ill-defined conditions)

- Fever, seriously ill, vomiting
- Headache/nausea
- Fainting, fatigue, fast beating of the heart, (imbalance of the elements)
- Shortness of breath
- Senility
- Insomnia
- Common cold
- Possessed by evil spirits, or need of protection from evil spirits
- Common illness or soreness

II. Diseases of the respiratory system

- Tonsilitis
- Bronchitis
- Influenza
- Pneumonia
- Asthma
- Sore throat

unrelated: Herbal medicine for increased
Ear disease
Allergy

III. Diseases of the digestive system

- Dental problems
- Peptic ulcer
- Appendicitis
- Hernia
- Flatulence, constipation
- Hemorrhoids
- Intestinal disease
- Worms, parasites
IV. Complications of pregnancy, childbirth and the puerperium

Hyperemesis gravidarum
Ante-natal care
Child delivery
Caeserian operation
Abortion
Hemorrhage
Disease/inflammation of the uterus
Hysterectomy, abortion (by curettage)
Menstruation problems
Post-natal examination

V. Infective and parasitic diseases

Cholera
Typhoid fever
Diarrheal disease
Tuberculosis, lung disease
Diptheria
Cough, whooping cough
Tetanus
Polioyelitis
Chicken pox
Measles
Rabies
Malaria
Venereal disease
Jaundice
Vaccination of all Kinds
Eye disease, of all Kinds
Encephalitis
Child diseases
Boils
Edema (riboflavin deficiency)

VI. Nutritional and metabolic diseases

Goiter
Diabetes Mellitus
Nutritional deficiency
Anemia
Beriberi
Disease of the gallbladder
Disease of the pancreas
Angular stomatitis (riboflavin deficiency)
Loss of appetite
VII. Accidents

Car accident
Boat accident
Fractured skull
Burns
Broken arms, legs, or backbone
Broken ribs
Snake bite
Gun/knife wound
Other wounds
Other accidents

VIII. Miscellaneous

Cystitis
Kidney disease
Skin disease
Diseases of the bones, joints, and muscles
Arthritis
Cancer, cyst
Surgery
Family planning
General physical examination, X-ray
Cyst, non-malignant

IX. Diseases of the nervous system, sense organs and circulatory system

Neurosis
Epilepsy
Paralysis
Hypertension, low-blood pressure
Heart disease
Brain disease
Disease of the lymph

B.2 Where do most people in this area prefer to go when they are sick?

Other hospitals, whether government or private not mentioned

Government facilities(1)

Government hospital in Bangkok
Provincial hospital
District hospital
Medical and health service center
   (includes municipality health centers)
Second class health center
Midwifery center
Tambon doctor
Other government health facilities, not specifically classified
Mobile clinic

Private clinics and hospital (of gov't personnel or private M.D.'s)

Private M.D.
Private nurse
Private (gov't) midwife
Private male health worker
Private hospital in Bangkok
Private hospital, other than Bangkok
Other private clinics

Non-government practitioners

Practitioner "maw", no specific details given
Injection doctor
Traditional doctor
Granny midwife
Spirit doctor
Buddhist monk doctor

Other options

Do nothing
Take care of yourself
Have a friend take care of you
Buy drugs at a drugstore (first or second class)
Buy drugs at a small shop
Depends on what the doctor recommends
Others
No answer/don't know
Inappropriate

B.3 If someone in your household has a non-serious illness or injury, how will you react/where will you go?

(For coding key see question B.2.)

Location of place of service

(For coding key of private providers of medical service, use Codebook: Muban Listing.) For coding key of government health service providers, use Coding: Health Facility Listing.

B.4 If you are not cured, whom/what place will you go to next?
B.4.1 To whom/what place would you go next?
   (For coding see question B.2.)

Where?
   (For coding key see question B.3.)

B.4.2 To whom/what place would you go after that?
   (For coding key see question B.2.)

Where?
   (For coding key see question B.3.)

B.5 Has there ever been anyone in your family with a minor illness, such as a headache, stomachache or fever, if so, answer the following questions for the most recent person in the household.

B.6 What illness?
   (For coding see list of diseases under question B.1.)

B.7 Age of the patient at the time

B.8 Sex of the patient

B.9 To whom/what did you go?
   (For coding key see question B.2.)

Where? (What tambon?)
   (For tambon codes see Codebook: Muban Listing.)

B.10 Suppose someone in your family has a serious injury or illness (i.e., that makes you bedridden, so you cannot work), what would you do?
   (For coding see listing of options under question B.2.)

Where? (What district?)
   (For tambon codes see Codebook: Muban Listing.)

B.11 Suppose you aren't cured, where would you go next? (Specify up to three placed in order)
(For coding see key in question B.2.)

**Where? (What tambon?)**

(For tambon codes see Codebook: Muban Listing.)

**Why would you go there?**

- Doctor is good/cures better
- More doctors and nurses
- Doctors and nurses take care of the patient better
- More and better equipment
- More types of medicine
- Cheaper service
- Cheaper medicine
- Have been treated there before
- Friends or relatives suggested this place
- Near home
- Better medicine
- Don't know where to go
- Know the doctor
- Wasn't cured
- Have relatives or friends working there
- Tambon doctor suggested
- Other reasons
- No answer
- Inappropriate

**Travel time to where you go**

(Coded in minutes.)

- 30 minutes
- 1 hour
- 10 hours
- No answer/don't know
- Inappropriate
B.11.2 and B.11.3

Third and Fourth choices for medical treatment of a serious injury/illness

These answers follow the very exact format of question B.11.1 and therefore will only have their column numbers listed below with those of question B.11.1

Suppose you aren't cured, where would you go next?

<table>
<thead>
<tr>
<th>By whom/what</th>
<th>Where</th>
<th>Why</th>
<th>Travel time</th>
</tr>
</thead>
</table>

B.11.1 First choice
B.11.2 Second choice
B.11.3 Third choice

B.12 Has there been a person in this household with a serious injury? If so, then answer the following questions on the most recent case.

B.13 Type of illness

(For coding see list of diseases in question B.1.)

B.14 Age of the patient at time of illness
B.15 Sex of patient
B.16 To whom/what went for cure?

(For coding key see question B.2.)

Where? (what tambon?)

(For coding key for private providers of medical service, use Codebook: Muban Listing. For coding key of government health service providers, use Coding: Health Facility Listing.)

C. Family Planning

C.1 Are you or your spouse now practicing any method of family planning?

Now practicing
Used to practice, but now stopped
Never practiced
Inappropriate/no answer
C.2 Is there any reason you never used family planning?

No reason
It's not necessary
Want more children
Heard bad rumors about contraceptive methods
I don't like family planning
Never heard about it before
Family planning was not available when I was fecund
Other reasons
Inappropriate/now practicing/used to use but now stopped/
no answer

C.3 Do you think that you will want to use contraceptives in the next 2-3 years?

Yes
Not sure
No
Haven't thought about it
Inappropriate/now practicing/used to use but now stopped/
no answer

C.4 For "users": What method do you use/did you use last?

Pill
IUD
Injection
Condom
Female Sterilization
Abortion
Other
Inappropriate/never practiced family planning/no answer

C.5 For "discontinued users": Why did you decide to stop using birth control?

I didn't want to use it anymore
I got pregnant while using family planning
Wanted more children
Not satisfied with the method (because of side effects)
Too expensive to continue
Inconvenient to get to the distributor
There were bad rumors about the method
IUD removal
Uterus was removed
Am not fecund anymore
Other
Don't know/no answer
Inappropriate/never used/now using
C.6 Where do/did you go for family planning?

(For coding key, see question B.2.)

C.7 Where (which district) is the person/place in question C.6 located?

(For directions, see question B.3.)

C.8 How long does it take to get to this place?

(Coded in minutes.)

C.9 What are the three most important reasons you go there for service?

- Good reputation
- Modern/better equipment
- Good service
- Free service/cheap service
- Have an M.D.
- Have a well-known M.D.
- I know a friend who works there
- My friends and neighbors go there
- Near my home
- Not far from my home and gives better service than the place closest to my home
- It is conveniently located in the market that I go
- No special reason
- I like the place
- You don't have to waste time waiting
- Doctor referred me here
- There is only place available for service
- Accustomed to that place
- Received information from the government about the place
- Advised by friends and relatives
- Sterilized after giving birth
- The medicine is good
- There is no place near, has to go there
- Went there for business, then accepted family planning
- Other
- No answer
- Inappropriate

C.10 Have you ever gotten family planning from any place other than the above?

C.11 If so, from whom or what place?

(For coding key, see question B.2.)
C.12 Where (which district)?
   (For coding directions, see question B.3.)

C.13 How long does it take you to get there:
   (Coded in minutes.)

C.14 What is your reason for going there? (Give up to three reasons.)
   (For coding key, see question C.9.)

D. Travel-to-market Behavior

D.1 Is there a small market, or a small goods store around here?

D.2 What do you buy from this market?

D.3 Besides this small market, is there somewhere else you go shopping?

D.3.1 Where?

   District
   Township
   Village area
   (Coding key found in Coding: Market Listing.)

D.4 How long does it take to go to this (first larger) market?
   (Coded in minutes.)

D.5 How many kilometers is it to this (first larger) market?

D.6 How do you go to this market?

   Foot
   Bicycle
   Cart
   Truck-bus
   Bus
   Private boat
   Taxi boat
   Motorcycle
   Train
   Private car/taxi
   By several means, nothing specific mentioned
D.7 What is the round trip fare?

(In baht. Approximately 20 baht = US $1.)

D.8.1 In this muban is there a passenger bus (truck-bus) that goes to market?

D.8.2 In this muban is there boat service?

D.9.1 Round-trip vehicle fare (in baht).

D.9.2 Round-trip boat fare (in baht).

D.10 How often do you or your spouse go to this market in a month?

(Total includes going alone or together.)

D.11 Do you think that you are satisfied with this market?

Not satisfied, but it's close to home
Satisfied somewhat
Satisfied
Very satisfied
No answer

D.12 Is there anytime going to this market is more inconvenient for you?

Yes
No
No answer
Inappropriate

D.12.1 When

Rainy season (June-October)
Dry season (February-May)
Cool season (November-January)

D.12.2 For how long (in months)?

D.12.3 During this time the trip take how long?

(Coded in minutes)

D.13 Besides this (above) market, is there any other market you go to?

D.13.1 Where?

District
Township

Village area

(Coding key found in Coding: Market Listing.)

D.25 How long does it take you to go to this (second larger) market?
(Coded in minutes.)

D.26 This (second larger) market is how many kilometers away?

D.27 How do you go to this (second larger) market?
(For coding see question D.6.)

D.28 Is there any bus (truck-bus) that passes through this village and goes to this (second larger) market?

D.28.1 Is there any boat that passes through this village and goes to this (second larger) market?

D.29 Round-trip vehicle fare (in baht).
Round-trip boat fare (in baht).

D.30 How many times per month do you go to this (second larger) market?

D.31 Does this (second larger) market have any special things different from the first larger market?

Yes
No, both markets are the same
Has less things than the first market
The trip is convenient all year round, so I go there
Sometimes the trip to the first market is difficult, and therefore I must go to this (second larger) market
Inappropriate/no answer

D.32 Last year your husband (or yourself) went to the changwat center (Suphanburi) how many times?

D.33 Last year your husband (or yourself) went to other changwat centers how often? (This excludes trips to Changwat Suphanburi.)

D.34 In the last five years your husband (or yourself) went to Bangkok how often?
E. Use of Government Health Service

E.1 Where is the government health facility closest to your home?

Where (district)?

(Coding key in Coding: Health Facility Listing.)

Type of facility

Midwifery Center
Second Class Health Center
Medical and Health Center
Amphoe Hospital
Changwat Hospital
Health facility, but the respondent doesn't know the class
No answer
Inappropriate

E.2 Is this health facility closest to your home the same place where you usually go to market?

Yes
No, but it's at the location of my "second most usual market"
No, but it's at a place that I sometimes go shopping
Yes, but I rarely go to the market
No, it's located in a city or town where I never go shopping
No, it's at a separate location not close to any market
No, it's in a group of government building, but not close to the market
Other
Inappropriate/no answer/There is none

E.3 What do you want the government to change about the government health center nearest to your home to make the service better and more convenient for you? (Two possible suggestions.)

Want more personnel
Want more skilled personnel
Want more convenient service
Want better (more respectful) service
Need for better building and equipment
Need for cheaper medicine and treatment
Want stronger medicine and more adequate supply
Don't know
Need for better location for H.C. and better transportation
Already good
E.4  Do you think that if this closest health center sold "strong drugs" such as an amphoe/changwat drugstore, it would be useful for you?

Yes, most useful
Yes, somewhat useful
Not useful at all
Not sure
Don't know
No answer
Inappropriate (municipal respondents)

Why?

If the answer to Q.E.4 is "yes", select responses from section A; if "not useful", select the responses from section B.

A. About the distance
   Effectiveness of medicine
   Reliability of medicine
   Cost of medicine
   Diagnosis
   Irrelevant answer/other
   Good

B. Dangerous effect of medicine
   Quality and effectiveness of medicine
   Long run effect
   Cost of medicine
   Medicine right for the disease

E.6  Where is the second class center closest to your home?

(Coding key in Coding: Health Facility Listing.)

E.7  How long does it take you to travel to this place?

(Coded in minutes.)

E.8  How many kilometers is it from your home?

E.9  Where is the medical and health service center/amphoe hospital closest to your home?

E.10 How long does it take you to travel there?

(Coded in minutes.)
E.11 How many kilometers is this?

E.12 Where is the changwat hospital (or equivalent) closest to your home?

E.13 How long does it take you to travel there?
    (Coded in minutes.)

E.14 How many kilometers is this?

E.15 Have you ever used the government health system?

E.16 If not, what is the reason for not using the government health service system?

    Never heard about it before
    Don't know where to get the service
    Don't dare to go there: it seems
        Too official
        Too far
    Don't like the government personnel
    Too expensive
    Prefer traditional doctors
    Private clinics are better
    Service is bad
    Ineffective cures
    Hours are not convenient
    Long waiting time
    Never got serious illness
    I go to see the "tambon doctor"
    "Anamai" gives only the preventive service, no medical treatment
    It's inconvenient
    I am a "maw" myself
    No reasons to go
    Inappropriate

E.17 Suppose in your amphoe there is no government health service and the government proposed to build one of the three possible places:

    1. A second class health center in your village
    2. A large health center with a permanent doctor in a nearby township
    3. A district hospital with three permanent doctors and 30 beds, but yet further away (e.g., in the district center)
Which one will you choose?

Second class health center (in village)
First class health station (in nearby township)
District hospital (farther away)
Don't want to make a choice
Don't know

E.18 How do you want the government to improve the health service system? (Up to two possible suggestions)

Want more and better skilled personnel
Want more convenient service
Want better (more respectful) service
Need for new buildings and equipment
Need for cheaper medicine and treatment
Want stronger medicine and a more adequate supply
Need for better location of health center, and better transportation
Already good

E.19 Opinion of interviewer about respondent

(Information not coded.)

E.20 The closest second class health center

Health facility code: found in Coding: Health Facility Listing
(This information was determined by accurate measurement by the researchers. The distance follows road or water distance, and in case of equi-distance health centers, the one with the better road access was chosen.)

Number of Kilometers from the village to that second class health center

END OF QUESTIONNAIRE
Appendix C.2

THE HEALTH WORKER QUESTIONNAIRE

Date given: February - April 1977
Sample size: 108 government health workers
Survey site: Suphanburi Province
Survey organization: Institute for Population and Social Research, Mahidol University
Language: Administered in Thai

Note: Besides the interview questions translated below, there are also the coding categories for open-ended questions. These coding categories were drawn up after the survey.

Health worker's ID code

The first two numbers consist of the unique health station code found in Coding: Health Facility Listing. Following is the health worker's individual number which is assigned to each different worker at the facility who was interviewed.

Q.1 Type of facility

Changwat Hospital
Amphoe Hospital
Municipal Health Center ("Suksala")
Second Class Health Center
Midwifery Station

Location of facility: township

Tampon
Listing of the 95 tambons and two municipalities in Suphanburi are found in Codebook: Muban Listing.

Location of facility: district

Amphoe Muang
Don Chedin
Doembang Nangbuat
Bang Pla Ma
Si Prachan
Sam Chuk
Song Phi Nong
U Thong
King Amphoe Dan Chang
Q.2 How long have you been a government official?

Q.3 How long have you worked here (at this health facility)?

Q.4 Your position is _______ and your rank is ________?

- Doctor (possible ranks 4-7)
- Health Personnel (ranks 1-5)
- Sanitarian (ranks 1-2)
- Nurse (ranks 2-4)
- Midwife (ranks 1-3)
- Nurse Aide (ranks 1-3)
- Other specify ____________________

(Possible government official rankings are listed for each position in parentheses.)

Q.5 How old are you? (in years)

Q.6 What province were you born in?

(Listing of the provinces is found in Code Listing for all Changwats and Amphoes: Thailand, 1975.)

Q.7 How long have you lived in this district?

Q.7.1 How long have you lived in this tambon?

Q.8 How long have you gone to school (not including health training)?

Q.9 How long did you go to school for health and medical education?

Q.10 For how long did you have an internship or practical in-work training?

Q.11 After becoming an official, did you receive any special training? If ever, for how long?

Q.12 Why did you want to come to work here? (Two reasons, ranked in importance)

- Location or residence
  - Near home
  - Don't want to live in Bangkok

- Altruism
  - Want to help people of the countryside
  - Help the people accept and understand the government health service
  - Want to improve the government health system
- Personal
  Moved to live with spouse
  For personal achievement in work goals
  Wanted to change the place of work
  Personal friend wanted (helped) him get the job
  Personally volunteered to come here, knows the people here

- Cost
  Cost of living cheaper

- Job or promotion related
  The government sent him here
  There was a position open at this health center

- Communication
  Convenient, assessible to roads

- Other

Q.13 How long do you think you will work here?

Q.14 After that, what will you do?
  Rest
  Return to government work in Bangkok again
  Go for further study
  Start or carry on my own business
  Transfer to another health facility
  (Inappropriate question)

Q.15 What is your marital status?
  Single
  First marriage
  Second (or more) marriage
  Divorced
  Separated

Q.16 How many children do you and your spouse have: (including any who died), i.e., Children-ever-born

Q.17 Do you or your spouse practice birth control?
  Presently practicing
  "Ever-practiced, now stopped"
  Never practiced
  Inappropriate (single)
Q.18 What method are you practicing/did you practice?

Pill
IUD
Injection
Condom
Female sterilization
Male sterilization
Safe period

Q.19 If Q.17 is "ever-practiced, but stopped", then ask, "Why did you stop practicing?"

Wanted more children
Unsatisfied with the method, because of side effects

HEALTH FACILITY INFORMATION

Q.20 How many years ago was this health facility established?

Q.21 Is the present facility (just service buildings) as it was originally?

Q.22 If there has been additional construction, what changes have been made?

Repair work
New or enlarged service rooms
A new building
More than one new building
More equipment (in general)

Q.23 Is this facility on the original site chosen for the health center?

Q.24 Why was this present location chosen?

In or near the center of the town/market/temple; site with high population density
Easily accessible to the people (i.e., on good transport routes)
Land donated by villagers/temple
Placed on government land or compound
Government policy (e.g., administrative or boundary changes)
Placed a reasonable distance from other health centers
To make this area more developed
Don't know; no answer
Others
Q.25 Who made the decision to pick this location?

The head district officer ("Nai Amphoe")
The district public health officer ("Sataranasuk Amphoe")
Village committee, health committee
Tambon Chief ("Kamnan")
Village headman ("Puyai Ban")
Member of parliament
Small municipality ("Sukabiban") committee,
local (township) committee
Don't know; No answer
Others

Q.26 At present this facility has how many rooms for official health use?

Q.27 Does this health facility have any official vehicles (jeeps, motorcycles, boats, bicycles) for use on the job or for home visits?

Q.28 How do most people usually come to this health center? (People may choose more than one type of transport.)

Motorcycle
Bicycle
Walking
Boat
Bus, Truck-bus
Private car
Three-wheel pedal-cab ("Samlor")

Q.29 Can people in this tambon/amphoe/changwat receive service here the whole year?

If not the whole year, what period is it difficult to travel?

Rainy season
Inappropriate

About how many months?

Q.30 About how long does it take the person furthest away in this township/district to come to this health facility?

(Coded in minutes. Township used for second class health center, and district for district hospital.)
Q.31 *Is there any equipment here that you would consider different from the average second class health center/district hospital/provincial hospital?*

**Type of equipment?**

- Injection apparatus for the dead
- Electric sterilizer
- More beds than usual

Q.32 *Does this second class health center/hospital lack any equipment that the others have?*

- Yes
- No
- Don't know

**What type of equipment? (Two possible answers.)**

- Medicine
- Office supplies
- Refrigerator
- X-Ray equipment
- Anesthesizer
- Cabinets and cupboards
- All other equipment
- Don't know, no answer
- Beds
- Lacking most all equipment

Q.33 *What are your main activities in a week? (List in order of importance up to three activities.)*

- Patient care
  - Curing
  - Giving injection
  - Child delivery, ante and post-natal care
  - Family planning, vasectomy, etc.
  - Dispensing medicine

- Office work
  - Correspondence
  - Take care of handling money
- Outside-of-office work
  Home visits, patient follow-up, curing
  Maternal and child care at home
  Inspecting and co-ordinating
  Household surveying
  Health education at school
  Advice on construction of sanitary facilities
  Mobile clinic
  Prevention of disease, giving injections
  First aid unit

- Miscellaneous
  Development of (better) health
  Improvement of the environment
  Village development
  Consultant work for village or town committees
  Help in all sorts of ways

- Technician work
  Laboratory technician
  No answer

Q.34 What time is the health center open for family planning?
  Tuesday, Thursday
  Monday, Wednesday, Friday
  Everyday except government holidays
  Everyday, all the time
  Wednesday
  Inappropriate
  Don't know

Q.35 Do you think your family planning service hours are convenient for people?
  Most convenient
  Fairly convenient
  Indifferent
  Fairly inconvenient
  Other
  No answer

Q.36 Do you make home visits? If so, about how many per month on the average?
Q.37 Do you work outside the health center on official health duties?

Yes, quite a bit
Yes, sometimes
Yes, but very seldom
No, never
No answer
Inappropriate

Q.38 If yes, (in Q.37), what kind of work?
(Give up to two answers, no ranking; Coded as in Q.33)

Q.39 In what cases do you usually refer people elsewhere?

Vasectomy and female sterilization
Serious sickness, condition or accident
When lacking medicine, expertise, or equipment
  for a specific disease
Complications (e.g., in childbirth)
When cannot diagnose
If the patient wants to go elsewhere
Don't know
Inappropriate question

Q.40 In the case of minor sickness you cannot cure, where will you refer or suggest the patient to? (Give up to two options.)

- Other hospitals, whether government or private not mentioned.

- Government institutions
  Government Hospital in Bangkok
  Provincial Hospital
  Amphoe Hospital
  Medical and Health Service Center (or Municipality health Center, "Suksalla")
  Second Class Health Center
  Midwifery Center
  Tambon "Doctor" ("Pheet Pracham tambon")
  Other government health facilities, not specifically classified
  Mobile clinic

- Private clinics and hospitals (of government personnel or Private M.D.'s)

  Private M.D.
  Private nurse
  Private (govt.) midwife
  Private male health worker
  Private hospital, specifically in Bangkok
  Private hospital, other than Bangkok
  Other private clinics
- Non-government practitioners
  Practitioner "maw" (doctor), no specific details given
  Injection doctor ("maw chit yaa")
  Traditional doctor ("maw borran")
  Granny midwife ("maw pi")
  Buddhist monk doctor ("maw pra")

- Other options
  Do nothing
  Take care of yourself
  Have a friend take care of you
  Buy drugs at a drugstore (first or second class)
  Buy drugs at a small stop
  Depends on what the doctor recommends
  "Bangkok"
  Others
  No answer
  Inappropriate

Q.41 In the case of a serious injury that you cannot cure, where do you refer the patient on to?: (Give up to two options; Code as Q.40)

Q.42 Do you think that there are times when people in this area would go other places instead of coming here to this health center?

Q.42.1.a If yes, in what case?

Minor illness
Moneyed people
People with serious sickness or medical problem
When people have (more) faith in some other medical practitioner or service facility; when they are accustomed to some other medical practitioner or facility
When people go for business or shopping in some other place that has medical services
When the people believe the doctor or practitioner at some other place is more educated; want to see doctor
When people believe that the health center here is inadequate (in treatment, medicine, etc.)
When people believe that this health center is inconvenient e.g., because it is far away

Q.42.1.b If yes, where do they go? (Responses as Q. 40.)
Q.42.1.c  **If yes, why?**

- Other place's service generally better
  - It offers faster service (less waiting time)
  - It offers better personal service
  - It offers more effective, reliable service
  - When the people are accustomed to another person or place they have previously been to
  - When the people have more faith in another person or place
  - It has an M.D. or better educated/trained personnel

- Other place is easier to get to
  - It's more accessible
  - It is the same place/market they travel to for business

- Due to inadequacies of the health worker's own health facility
  - His health facility is ill-equipped
  - His health facility has only "weak" medicine
  - His health facility cannot provide the requested service
  - People do not have confidence in this health facility

- Characteristics of the patient
  - Wealthy people
  - Seriously sick or hurt people

- Miscellaneous
  - Depends on the villagers
  - When there is a need for continual treatment
  - Villagers don't know yet that the health facility has opened
  - Villagers make the mistake of thinking a private health facility is really government
  - No answer
  - Not appropriate

Q.42.2  **Second answer for people going somewhere else instead of the respondent's health facility.**

(Responses as in Q.42.1.)

Q.42.3  **Third answer for people going somewhere else instead of the respondent's health facility.**

(Responses as in Q.42.1.)
Q.43 How many health personnel, including yourself, are working here full time? List the number for each position.

- Doctors: 
- Health officials: 
- Sanitarians: 
- Nurses: 
- Midwives: 
- Nurse Aides: 
- Total number of personnel: 

Q.44 Do you think that the number of health personnel here is sufficient?

Q.45 In your opinion how many extra health personnel should be added? List the number of each needed at their various positions.

- Doctors: 
- Health officials: 
- Sanitarians: 
- Nurses: 
- Midwives: 
- Nurse Aides: 
- Total number of personnel: 

Q.46 Do you think that a larger supply and variety of drugs, including more "dangerous drugs" would increase the number of people who use this health facility?

- Yes, it would increase the usage of this facility more
- Yes, but just a little
- No, it wouldn't make any difference
- Don't know

Q.47 Do you personally think that if the Ministry of Public Health had a program to have second class health centers sell "dangerous drugs" at market competitive prices to the local people, would this be beneficial?

- Not beneficial at all
- Somewhat beneficial
- Beneficial
- Very beneficial
- Don't know

Q.48 Why would selling "dangerous drugs" at market prices be beneficial or not? (Why? relating to Q.47.)

- Health worker can better administer medicine
If properly trained the health worker can administer the medicine better
The health worker has more knowledge in administering medicine, and knowledge about disease
The health worker can better explain and advise the patient about the drugs
The health worker can offer better service than a drugstore
The health worker can cure more effectively
The health worker has more medical knowledge than a druggist

- Strong medicine is better
  Strong medicine cures better

- Convenient for villagers
  Can help the villagers more
  More convenient for the villagers in general
  Villagers don't have to travel far for "dangerous drugs"

- Better treatment for villagers
  Can give immediate treatment to the patient
  The patient can use the medicine more correctly
  The patient doesn't have to use "fake medicine"
  Makes it safer for the villagers to take strong medicine

- Promotes better government health service
  Helps expand the service of the health center

- Miscellaneous
  If the government so orders, then we have to do it

- If not useful at all (response of "not useful" to Q. 47)
  Lessen the importance of the doctor (M.D.):
  people would get drugs without proper doctor's advice
  The health worker does not have time to sell drugs all day
  The health worker does not have enough experience or knowledge in administering the medicine
  Self-injection can cause complications
  Health worker doesn't want to take profit from the villagers.

(Note: The first five headings are for "useful" responses.)
Q.49 If the Ministry of Public Health would allow health officials to sell "dangerous drugs", would you voluntarily sell them?

No
Yes (but not satisfied with the policy)
Yes
Don't know

Q.50 Why would you be willing to sell the "dangerous drugs"? (Reason for answer in Q.48.)

(Responses found in Q.48)

Q.51 Have you ever had a shortage of governmental instruments or medicine?

Never
Yes, sometime
Yes, often
Yes, all the time
Don't know

Q.52 If ever (Q.51), for what reason(s)?

- New health center
  New health facility yet to be fully equipped

- Budget
  Late budget
  Not large enough budget

- Delivery
  Late delivery of drugs
  Government has not resupplied the health center's stock
  Government won't honor further requests for resupply of medicine

- Shortages
  Shortage or small supply of medicine
  Shortage of instruments
  Shortage of beds
  Shortage of transport
  No transport
  Depreciation
  Equipment deteriorating and not replaced
Q.53 Do you think the present family planning service at this health facility is sufficient?

No, not sufficient  
Somewhat sufficient  
Yes, but improvements can be made  
Yes, quite sufficient  
Don't know

Q.54 If the family planning program can still be improved, then what changes might be made to improve the present program?

- Information  
  Spread more information, publicity  
  Get good attendance at meeting on family planning  
  Send out health workers to motivate people for family planning

- Sterilization  
  Use mobile clinic for sterilization  
  Permit health centers to perform sterilization

- Injections  
  Expand family planning injections

- Pills  
  Improve the quality of the pills

- Cost  
  Find ways for people to get family planning cheaper  
  Want all family planning free

- General  
  Expand family planning services  
  Send a midwife to this health station so service can be adequate  
  Need more equipment from government  
  Inappropriate

Q.55 Now I am going to ask you about several other providers of medical and health services. Could you say 1) about how many there are in this township or near this health station, 2) the approximate distance to the nearest one, and 3) whether or not you feel they are competition* to you in providing medical service to the people of this area?
Length (#2) is classified in kilometers:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-499 meters</td>
<td>00</td>
</tr>
<tr>
<td>500 meters-1.49 kilometers</td>
<td>01</td>
</tr>
<tr>
<td>Don't know</td>
<td>97</td>
</tr>
<tr>
<td>No answer</td>
<td>98</td>
</tr>
<tr>
<td>97 or more kilometers</td>
<td>99</td>
</tr>
</tbody>
</table>

"Competition" in Thai connotes that another place (person) has conditions more favorable to the people, not that they feel they must strive to get more customers vis-a-vis other competitors.

Competition (#3) is coded:

<table>
<thead>
<tr>
<th>Competition</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>No competition</td>
<td></td>
</tr>
<tr>
<td>Some competition</td>
<td></td>
</tr>
<tr>
<td>Much competition</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
</tr>
<tr>
<td>No answer</td>
<td></td>
</tr>
<tr>
<td>Not appropriate</td>
<td></td>
</tr>
</tbody>
</table>

Identification of columns (Q.55)

<table>
<thead>
<tr>
<th># Nearby</th>
<th>Distance to Nearest</th>
<th>Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugstore (or store selling drugs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private clinic of government official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Based Family Planning Volunteer (Mechai)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government &quot;Tambon&quot; Doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injection doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granny Midwife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt. Midwifery Station</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Govt. Second Class Health Station</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical and Health Service Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphoe Hospital (government)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changwat Hospital (government)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q.56 **What do you think are the best points of the service offered by this health facility?** (Two possible answers, not ranked)

- Maternal and child health
  - Child delivery
  - Child care

- Family planning
  - Family planning, in general
  - Sterilization

- Curing
  - Curing

- Preventive work
  - General check-up
  - Prevention of contagious disease

- Others
  - First aid
  - Sanitarian work
  - Referral work
  - Family health service
  - No answer
  - Inappropriate (e.g., health station just opened)

Q.57 **What do you see as the major deficiencies of service here?** (Give up to two options, no ranking)

- Personal relationships
  - Need better cooperation between co-workers
  - Need better cooperation between boss and workers
  - Need better cooperation between school, government administrators, temple, and here
  - Need to keep up morale

- Administrative
  - Lack budget, in general
  - Lack of budget, for extras or small things
  - Need a more definite policy on health worker curing
  - Need to allow health worker to work in curing more
  - Should increase personnel to fill required positions
  - The government should send equipment and medicine as requested, if possible
- Training
  Need training in bookkeeping
  Need more training in curing
  Need more training in family planning
  Government should encourage health workers and nurses to get further training and/or education

- Personnel
  Need M.D.
  Need other personnel
  People lack faith in the health center, especially for treatment of serious illnesses
  People lack faith in the health center, especially because the health worker is young, new in the area or inexperienced
  Need a family planning unit, or a doctor qualified to do sterilizations to come in to work

- Lack of equipment
  Lack of transport (vehicles) for the health center
  Lack of transport for the people to use when coming to the health center
  Lack of equipment, in general
  Need more equipment

- Problems with medicine
  Need improvement of family planning pills
  Need improvement of medicine, in general
  Lack specific medicine for specific diseases
  Storage of effective medicine
  Lack of medicine in general

- Problems in treatment
  Lack effective treatment

- General
  Need adequate clean water
  New health center is not yet well known to the local people
  Sanitary work lacking
  Service rooms not sufficient
  Need more publicity of government health services
  Need more publicity for government family planning
  Give family planning service free
  Need electricity
- Social welfare
  Want housing for health worker
  Want to increase price of medical treatment to include travel to patient's home
- No answer

Q.58 Are there any other further important problems that you have not yet mentioned? (Three options, no ranking.)

(Possible answers found in Q.57)

Q.59 Are there any other recommendations you would like to express to improve health and family planning service for the local people? (Can you give up to three recommendations, no ranking.)

(Possible responses to be found in Q.57)

Q.60 Respondent's sex

Q.61 Interviewer's evaluation of the respondent's sincerity in responding.

  Insincere
  Some sincerity
  Sincere
  Most sincere

Q.62 Interviewer's evaluation of the correctness and reliability of the respondent's answers. (Note: for all but about five interviews the interviewing was done by the same person.)

  Not reliable
  Somewhat reliable
  Reliable
  Most reliable

HEALTH CENTER AND ITS TOWNSHIP INFORMATION

The following information was gathered for each health center and the tambon (commune or township) in which it is located. The information comes from the observations and judgement of the interview team as well as the health workers themselves. This data is by nature of its collection and recording identical for each health worker working at the same health facility.

Q.A.1 The number of muban (village areas) in the tambon
Q.A.2 The number of contiguous townships to the surveyed township

Q.A.3 The number of contiguous townships with a health facility

(About 20-35% of the tambons on Q.A.2 and Q.A.3 have estimates because partial information only was available for tambons outside of Suphanburi. This, however, does not markedly change the accuracy of these statistics because there are not many bordering tambons.)

Q.A.4 The closest amphoe hospital, changwat hospital, or military hospital

(See Codebook: Health Facility Listing)

Q.A.4.1 Distance to this closest amphoe, changwat, or military hospital

(Coded in kilometers)

Q.A.5 The closest second class health center

(See Codebook: Health Facility Listing)

Q.A.5.1 Distance to the closest second class health center

(Coded in kilometers)

Q.A.6 The closest changwat (provincial) type hospital. This includes official government Ministry of Public Health changwat hospitals as well as large military hospitals which are open to the public.

Changwat Suphanburi Hospital
Kamphaengsaen Air Force Base Hospital
Changwat Singburi Hospital
Changwat Chainat Hospital
Changwat Kanchanaburi Hospital
Changwat Angthong Hospital

Note: The closest place is figured by road distance, and in case of equidistant places, the one more quickly accessible was chosen. (Q.A.4, 5, and 6)

Q.A.6.1 Distance to this nearest hospital

(Coded in kilometers)

Q.A.7 Description of major communication routes
Highway, good highway, roads good
Roads O.K., average (paved)
Dirt roads: O.K., main roads
Dirt roads: fair
Dirt roads: not good, bad, poor
Major route: water with good location (on river
    or connecting with many transport canals)
Major route: water, somewhat out of the way

Q.A.8 Location of health station (Two reasons possible in some cases)

Highway
Paved road
Dirt road (good condition)
Dirt road (poor condition)
Away from the main road (less than 1/2 km.)
Along the river bank, canal
Away from waterway (less than 1/2 km.)

Q.A.9 Market type or administrative unit in which health facility is located

Changwat market
Amphoe market
Sukabiban (Sanitary district) market
Tambon market
No answer on market

Q.A.9.1 Total # of factories in the tambon including: saw mills, ice factories, sugar mills, cassava mills, and others. Rice mills are not to be counted.

Q.A.10 Major crop(s) of township (Can list up to four major crops)

Rice, single crop
Rice, double crop
Sugar cane
Cassava
Corn
Tobacco
Oil seeds
Fishing
Fish farming
Duck farming
Fruit orchards
Watermelon
Potatoes
Peppers
Beans
Squash
Q.A.11 **Total population of tambon** (district in the case of a district hospital)

Q.A.12 **Total family planning acceptors for one month** (March, 1977)

Q.A.13 **Total patients for six month period** (August 1, 1976 to January 31, 1977)

END OF QUESTIONNAIRE
Appendix D.1. Factor Analysis of the Independent Variables

The factor analysis of the 50 independent variables is presented in this appendix for two reasons. First, grouping the variables aided in the interpretation of their interrelationships in general and within the discriminant analyses. Second, the resultant factor scores of each dimension were used as independent variables in a discriminant analysis which paralleled that presented in Chapter VI (see Appendices A.6.2 and A.6.3). However, because of the similarity of those two approaches to the analysis and the difficulty of interpreting means of factor scores, only the results of the discriminant analysis with the specific individual variables were used to interpret the Family Planning Transaction Model.

It was decided to factor analyze the variables classified under each of the major four components of the conceptual model. The factor analyses were performed with varimax rotation which yields "as large loadings as possible relating to the fewest variables possible" (Yeates, 1974, 233). The resulting factors grouped similar variables and thus isolated important ideas. However, in the four analyses certain conceptually important variables did not load on any factor and therefore were removed from the factor analysis and later entered into
the discriminant analysis as separate variables. The factor analyses were then rerun without those variables. The number of factors was restricted so that all would be interpretable, while also trying to account for a reasonable percentage of the total variation. The specific results of the factor analyses for the potential user, provider, gap, and setting variables are discussed in the following paragraphs.

The Potential User Dimensions

The results of the factor analysis for the 14 "potential user" variables are presented in Table D.1. The loadings suggest four interpretable factors which account for 56.9% of the total variation. The first factor loads heavily with DEMOGRAPHIC variables: the age of the wife, years married, children-ever-born, and child mortality. The connections among these demographic variables appear clear: for example, we find in our sample older women, married longer, with more children as well as children who have died. The converse is also true.

The pattern of loadings on the second factor suggests an OCCUPATION-EDUCATION dimension. Two education variables load positively: the level of formal education and frequency of reading the newspaper. The occupation variables also load in the expected directions: government workers positively and farmers negatively. "No home electricity" also loads negatively, being associated with the farmers and the less educated.
Table D.1. Factor Analysis Results: Factor Loadings for Potential User Variables (Varimax Rotation).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Marital Status</td>
<td>-.042</td>
<td>.089</td>
<td>.008</td>
<td>.462</td>
</tr>
<tr>
<td>Relatives in Home</td>
<td>-.046</td>
<td>-.003</td>
<td>.183</td>
<td>-.379</td>
</tr>
<tr>
<td>Age of Wife</td>
<td>.799</td>
<td>-.013</td>
<td>.128</td>
<td>-.288</td>
</tr>
<tr>
<td>Education</td>
<td>-.298</td>
<td>.484</td>
<td>.062</td>
<td>.139</td>
</tr>
<tr>
<td>Years Married</td>
<td>.885</td>
<td>.006</td>
<td>.116</td>
<td>-.267</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>.742</td>
<td>-.078</td>
<td>.029</td>
<td>.242</td>
</tr>
<tr>
<td>Child Mortality</td>
<td>.488</td>
<td>-.079</td>
<td>-.016</td>
<td>.236</td>
</tr>
<tr>
<td>Occ: Farmer</td>
<td>-.006</td>
<td>-.645</td>
<td>.191</td>
<td>-.075</td>
</tr>
<tr>
<td>Occ: Government</td>
<td>-.049</td>
<td>.441</td>
<td>.085</td>
<td>.067</td>
</tr>
<tr>
<td>Occ: Informal Sector</td>
<td>-.017</td>
<td>.240</td>
<td>-.218</td>
<td>.017</td>
</tr>
<tr>
<td>No Home Electricity</td>
<td>-.041</td>
<td>-.479</td>
<td>-.029</td>
<td>.134</td>
</tr>
<tr>
<td>Read Newspaper</td>
<td>-.023</td>
<td>.505</td>
<td>.054</td>
<td>.046</td>
</tr>
<tr>
<td>Relative Land Holdings</td>
<td>.094</td>
<td>.047</td>
<td>.820</td>
<td>-.104</td>
</tr>
<tr>
<td>Land Owned</td>
<td>.062</td>
<td>.062</td>
<td>.729</td>
<td>-.087</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.52</td>
<td>1.42</td>
<td>1.29</td>
<td>0.57</td>
</tr>
<tr>
<td>% of Variance</td>
<td>43.6%</td>
<td>24.6%</td>
<td>22.0%</td>
<td>9.9%</td>
</tr>
</tbody>
</table>

56.9% of Total Variance Accounted for by the Four Factors.
The third factor loads highly on only two variables, both encompassing LAND HOLDINGS. The size of land holdings, an indicator of rural wealth, is represented in the "land owned" variable while "relative land holdings" indicates the amount of land owned relative to the other households in the township.

The fourth factor is somewhat tenuous because it has lower and less distinct loadings. Nevertheless, it yields a viable interpretation as a NUCLEAR FAMILY TYPE dimension. The first two variables, marital status and the number of relatives in the home load most heavily and in different directions. This indicates extended families with a "not-presently married" woman of the house, often the head of the household. The converse of this is the nuclear husband-wife household, not as likely to have relatives living with them.

The Provider Dimensions

The characteristics of the provider were summarized by three factor analytic dimensions. The first factor for the "provider" variables shown in Table D.2 indicates high factor loadings for two variables related to the SIZE OF FACILITIES. Although the variables "type of facility" and "number of rooms" have opposite signs, they are still consistent. Categories for "type of facility," in a somewhat confusing manner, number from one to five proceeding from the largest to smallest type of facility. If we straighten out this logic, the loadings indicate larger facilities with many rooms and less important facilities with fewer rooms.
Table D.2. Factor Analysis Results: Factor Loadings for Provider Variables (Varimax Rotation).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Facility</td>
<td>.774</td>
<td>.168</td>
<td>.373</td>
</tr>
<tr>
<td>Children-Ever-Born</td>
<td>.313</td>
<td>.780</td>
<td>-.139</td>
</tr>
<tr>
<td>IEC Important</td>
<td>-.141</td>
<td>.057</td>
<td>-.411</td>
</tr>
<tr>
<td>Number of Rooms</td>
<td>-.857</td>
<td>-.075</td>
<td>-.239</td>
</tr>
<tr>
<td>Family Planning Important</td>
<td>.184</td>
<td>.005</td>
<td>.684</td>
</tr>
<tr>
<td>Age</td>
<td>-.043</td>
<td>.855</td>
<td>.035</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>2.04</th>
<th>1.26</th>
<th>0.41</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Variance</td>
<td>55.0%</td>
<td>34.0%</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

80.2% of Total Variance Accounted for by the Three Factors.
The pattern of factor loadings for the second factor indicates a DEMOGRAPHIC dimension. Both the age and children-ever-born of the provider exclusively load high on this factor.

The third factor is of tenuous strength. However, despite the small eigenvalue and explanation of total variance, the factor loadings suggest an ATTITUDINAL dimension. There are contrasting attitudes towards the importance of family planning itself and the need for information, education and communication (IEC) in family planning. Those providers who consider family planning as one of their two most important functions show less interest in the need for IEC, and vice-versa. This gives some validity to a previous contention that an "interest" in IEC is in some ways a smokescreen for lack of interest or emphasis in the family planning program itself.

The Gap Dimensions

In the discriminant analysis the "gap" component was represented by four factor analytic dimensions and one individual variable. The first factor (Table D.3) had noteworthy factor loadings on three variables indicating DISTANCE TO COMPETITION. The "distance to the nearest Medical Doctor" had high positive factor loadings while the only meaningful factor loadings for "distance to a drugstore" were also positively associated with this factor. A third variable, which loaded on this factor negatively, was the "type of closest government family planning facility" (measured from smallest to largest type of
Table D.3. Factor Analysis Results: Factor Loadings for Gap Variables (Varimax Rotation).

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap: Family Planning Method</td>
<td>.035</td>
<td>.052</td>
<td>.339</td>
<td>-.160</td>
</tr>
<tr>
<td>Gap: Age</td>
<td>-.029</td>
<td>-.030</td>
<td>.723</td>
<td>.177</td>
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<tr>
<td>Gap: Education</td>
<td>.180</td>
<td>.107</td>
<td>.346</td>
<td>.018</td>
</tr>
<tr>
<td>Gap: Children-Ever-Born</td>
<td>-.092</td>
<td>.023</td>
<td>.456</td>
<td>-.033</td>
</tr>
<tr>
<td>Gap: Family Planning Practice</td>
<td>.027</td>
<td>-.100</td>
<td>-.111</td>
<td>.868</td>
</tr>
<tr>
<td>Gap: Marital Status</td>
<td>-.024</td>
<td>-.16</td>
<td>.199</td>
<td>-.217</td>
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<tr>
<td>Alt: Contiguous Townships with Facilities</td>
<td>.165</td>
<td>.592</td>
<td>.047</td>
<td>-.207</td>
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<tr>
<td>Alt: Private Sector Use</td>
<td>-.218</td>
<td>.783</td>
<td>.088</td>
<td>.080</td>
</tr>
<tr>
<td>Alt: Distance to Drugstore</td>
<td>.361</td>
<td>-.046</td>
<td>.035</td>
<td>-.160</td>
</tr>
<tr>
<td>Alt: Distance to M.D.</td>
<td>.874</td>
<td>.256</td>
<td>-.001</td>
<td>.026</td>
</tr>
<tr>
<td>Alt: Type of Closest Facility</td>
<td>-.548</td>
<td>.227</td>
<td>.047</td>
<td>-.208</td>
</tr>
</tbody>
</table>

| Eigenvalue | 1.32 | 1.31 | 1.00 | 0.79 |
| % of Variance | 29.9% | 29.5% | 22.7% | 17.9% |

57.7% of Total Variance Accounted for by the Four Factors.
facility). Such a "competition" factor indicates government providers who are far from medical doctors and drugstores and who most likely have a small government family planning facility nearby as their closest neighboring government facility.

The second factor was similar to the first and labeled as COMPETITION NEARBY. Two alternative provider variables loaded meaningfully on this dimension: "the percentage of contiguous townships with government family planning facilities" and "the existence of private sector competition." Both of these variables have a positive sign and indicate certain government providers in areas more saturated with government facilities and private competition as well. These providers probably work in more built-up areas, most likely in the more densely populated, older townships of the eastern part of the province.

A third factor loaded positively, but somewhat weakly, with all the social and demographic gap variables except family planning practice. The "gaps" in age and children-ever-born loaded most highly. These gap variables are difficult to interpret clearly in the context of factor analysis because a large gap, for example in age, may be the result of an older provider and younger potential user or vice-versa. Probably in the context of this dimension the demographic gap is more influenced by younger, low parity government providers and older, high parity potential users. The more pronounced difference in the particular method of family planning used rather than the actual practice of family planning itself is also consistent with this contention: the older women being less likely to use the most favored methods of the young, government family planning personnel.
The complexity of the third factor is further borne out by the fourth factor which loads high on only one variable, the GAP IN THE USE OF FAMILY PLANNING. This final factor is weak, and as it summarizes only one variable, it is not very helpful in terms of variable reduction. Similar to the third dimension, it is hard to interpret whether this gap is due more to the single government providers or surveyed women who do not use family planning. The former possibility seems more likely, if single family planning workers have more trouble recruiting acceptors as posited in the homophily-heterophily hypothesis (Rogers, 1973).

The Setting Dimensions

Factor analysis of the last component of our conceptual model, the "setting," was summarized by two highly interpretable factors. The factor loadings on the first factor in Table D.4 indicate a strong RURAL-URBAN dimension. Rural-urban (higher categories indicating more rural) and the existence of field-crop (sugar cane) farmers show the ruralness of this dimension. This is consistent with the negative sign for "number of mills," an urban variable.

The second factor is associated with whether or not the closest government family planning facility to a potential user is located in a market. The two variables which load high on this dimension are very closely related. They indicate whether the facility location is in the potential user's usual market or any market. This dimension can test
Table D.4. Factor Analysis Results: Factor Loadings for Setting Variables (Varimax Rotation).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural-Urban</td>
<td>.642</td>
<td>-.147</td>
</tr>
<tr>
<td>Facility in a Market</td>
<td>-.134</td>
<td>.742</td>
</tr>
<tr>
<td>Facility in Usual Market</td>
<td>.009</td>
<td>.707</td>
</tr>
<tr>
<td>No. of Mills</td>
<td>-.684</td>
<td>-.026</td>
</tr>
<tr>
<td>Transport Routes</td>
<td>.170</td>
<td>.045</td>
</tr>
<tr>
<td>Field Crops</td>
<td>.605</td>
<td>-.163</td>
</tr>
<tr>
<td>Location in Market</td>
<td>-.332</td>
<td>.036</td>
</tr>
<tr>
<td>Population of Township</td>
<td>.346</td>
<td>-.017</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Eigenvalue</th>
<th>% of Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.37</td>
<td>70.8%</td>
</tr>
<tr>
<td></td>
<td>0.98</td>
<td>29.2%</td>
</tr>
</tbody>
</table>

48.5% of Total Variance Accounted for by the Two Factors.
the importance of proximity to other services and the multipurpose market trip to increasing use of government facilities.