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Fertility in Thailand: Trends, Differentials, and Proximate Determinants

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Committee on Population and Demography
Commission on Behavioral and
Social Sciences and Education
National Research Council

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PREFACE

The Committee on Population and Demography was established in April 1977 by the National Research Council in response to a request by the Agency for International Development (AID) of the U.S. Department of State. It was widely felt by those concerned that the time was ripe for a detailed review of levels and trends of fertility and mortality in the developing world. Although most people in the demographic community agree that mortality has declined in almost all developing countries during the last 30 years, there is uncertainty about more recent changes in mortality in some countries, about current levels of fertility, about the existence and extent of recent changes in fertility, and about the factors determining reductions in fertility.

In 1963, a Panel on Population Problems of the Committee on Science and Public Policy of the National Academy of Sciences published a report entitled The Growth of World Population. The appointment of that panel and the publication of its report were expressions of the concern then felt by scientists, as well as by other informed persons in many countries, about the implications of population trends. At that time, the most consequential trend was the pronounced and long-continued acceleration in the rate of increase of the population of the world, and especially of the population of the poorer countries. It was estimated in 1963 that the annual rate of increase of the global population had reached 2 percent, a rate that, if continued, would cause the total to double every 35 years. The disproportionate contribution of low-income areas to that acceleration was caused by rapid declines in mortality combined with high fertility that remained almost unchanged: the birth rate was nearly fixed or declined more modestly than the death rate.

Since the earlier report, however, the peak rate of growth in the world's population has apparently been passed. A dramatic decline in the birth rate in almost all the more developed countries has lowered their aggregate annual rate of increase to well below 1 percent, and the peak rate of increase has also apparently been passed in the less-developed parts of the world as a whole. A sharp decline in fertility in many low-income areas has more than offset the generally continued reduction in the death rate, although the rate of population increase remains high in almost all less-developed countries.

The causes of the reductions in fertility--whether they are the effect primarily of such general changes as lowered infant mortality, increasing education, urban rather than rural residence, and improving status of women, or of such particular changes as spreading knowledge of and access to efficient methods of contraception or abortion--are strongly debated. There are also divergent views of the appropriate national and international policies on population in the face of these changing trends. The differences in opinion extend to different beliefs and assertions about what the population trends really are in many of the less-developed countries. Because births and deaths are recorded very incompletely in much of Africa, Asia, and Latin America, levels and trends of fertility and mortality must be estimated, and disagreement has arisen in some instances about the most reliable estimates of those levels and trends.

It was to examine these questions that the Committee on Population and Demography was established within the Commission on Behavioral and Social Sciences and Education of the National Research Council. It was funded for a period of five and one-half years by AID under Contract No. AID/pha-C-1161 and Grant No. AID/DSPE-G-0061. Chaired by Ansley J. Coale, the committee has undertaken three major tasks:

1. To evaluate available evidence and prepare estimates of levels and trends of fertility and mortality in selected developing nations;
2. To improve the technologies for estimating fertility and mortality when only incomplete or inadequate data exist (including techniques of data collection);
3. To evaluate the factors determining the changes in birth rates in less-developed nations.

Given the magnitude of these tasks, the committee decided to concentrate its initial efforts on the first two tasks; it initiated work on the third task in October 1979 when the Panel on Fertility Determinants was established.

As of early 1982, 168 population specialists, including 94 from developing countries, have been involved in the work of the committee as members of panels or working groups. The committee, the commission, and the National Research Council are grateful for the unpaid time and effort these experts have been willing to give.

The committee approaches the first task through careful assessment, by internal and external comparison, and through analysis, by application of the most reliable methods known, of all the data sources available. Each of the country studies therefore consists of the application of a range of methods to a number of data sets. Estimates of levels and recent trends judged to be the best that are feasible with available resources are then developed on the grounds of their consistency and plausibility and the robustness of the individual methods from which they were derived.

The committee's second task, refinement of methodology, is seen as a by-product of achieving the first. The application of particular methods to many different data sets from different countries and referring to different time periods will inevitably provide valuable information about the practical functioning of the methods themselves. Particular data sets might also require the development of new methodology or the refinement of existing techniques.

The third task of the committee, evaluation of factors determining birth rates, is the most difficult. Research on the determinants of fertility change has been carried out by scholars from several disciplines, and there is no comprehensive accepted theory of fertility change to guide the evaluation. Because of this state of knowledge of the causes of reductions in fertility and the difficulty of the task, the committee and the Commission on Behavioral and Social Sciences and Education established the separately funded Panel on Fertility Determinants, which includes scholars from anthropology, demography, economics, epidemiology, psychology, sociology, and statistics. Three committee members serve on the panel.

This report is one of the panel's country studies. It has been prepared by John Knodel, professor of sociology, University of Michigan; Apichat Chamratrithirong, associate professor, Institute of Population and Social Research, Mahidol University, Bangkok; Nibhon Debavalya, director, Institute of Population Studies, Chulalongkorn University, Bangkok; and Napaporn Chayovan, staff member of the Institute of Population Studies, Chulalongkorn University and doctoral student at the University of Michigan during the time of this study. The panel is grateful to these scholars for their extensive efforts in analyzing data from many sources and preparing this report.

As indicated in the title, this report stresses analysis of the proximate determinants of fertility. The task of analyzing these determinants and the more fundamental social, cultural, and economic factors associated with levels and changes in fertility behavior is complicated and time-consuming, especially in a country like Thailand that has available many and varied data sets. Given the time and budget constraints within which the work on the current report took place, it was not possible to fully analyze fertility determinants in Thailand, and thus the primary focus is on the proximate determinants. Indeed the authors of this report are collaborating on a project in Thailand during late 1982 and 1983 that uses this report as a starting point for an assessment of social, cultural, and economic fertility determinants, under the International Research Awards Program on the Determinants of Fertility in Developing Countries, a Population Council program funded by AID.

The authors and panel would like to gratefully acknowledge the kind cooperation of the following persons who provided information or data included in this study: Tony Bennett, Pornchai Boodsayaskul, Peerasit Kamnuansilpa, Debhanom Muangman, Chintana Pejaranonda, Yawarat Porapakkham, Peter Smith, and Thavisak Svetsreni. We also acknowledge with thanks the research assistance of the following persons: Ratana Ariyavisitakul, Rapeepan Hoonpanich, Uraiwan Kanungsukkasem, Siriwan Siriboon, and Anchalee Wisuttimak. Helpful comments were received from reviewers, including members and staff of the panel and committee.

CHAPTER 1

INTRODUCTION

In the course of a remarkably short time, Thailand's population has experienced a major transformation in its reproductive behavior. The result has been a steady and substantial decline in fertility since the mid or late 1960s, with all indications pointing to its continuation for at least some time to come. Just a decade ago, few observers were aware that a reproductive revolution was under way in Thailand and probably even fewer would have predicted the magnitude of change that actually occurred during the 1970s.

The rapidity and pervasiveness that has characterized the decline in fertility makes Thailand an unusually interesting candidate for a case study of the determinants of reproductive behavior in a developing country. As the result of research presented at a workshop held in Thailand in 1978, a thorough summary documenting recent trends in Thai fertility up through 1975 has been prepared and published (National Research Council, 1980). Newly available data indicate that the decline in Thai fertility clearly evident prior to 1975 has continued since then (Knodel et al., 1980). The objective of the present study is to examine in some detail the intermediate variables or proximate determinants (Davis and Blake, 1956; Bongaarts, 1978) underlying the levels, differentials, and changes in fertility in Thailand during the recent past, as well as to update the trends in fertility since 1975 using more recent data than was available at the time of the 1978 workshop.

THE COUNTRY SETTING

Thailand is a tropical country in the Indo-Chinese peninsula of Southeast Asia with a total population expected to reach 50,000,000 by the early 1980s. It is bordered by Kampuchea and Laos on the east and northeast, by Burma on the west and northwest, and by Malaysia on the south. The landscape within this area includes tropical rain forest, agriculturally rich plains, and forest-clad hills and mountains. Thailand's population is predominantly rural and agrarian. Even in comparison with other developing countries, the proportion living in urban areas is unusually low and the percentage of the labor force engaged in agriculture is unusually high (see Table 1). It also compares poorly in terms of several "quality of life" indexes, including access to electricity and safe water, and physicians per population. Nevertheless, Thailand falls in the middle range for developing countries with respect to average income as measured by GNP per capita and is above average in terms of adult literacy, female participation in the labor force, and life expectancy. It should be noted, however, that although literacy is almost universal, the proportion of adults that have gone beyond four years of schooling (until recently the basic elementary educational level) is quite small; as of 1976, only 14 percent of the population aged 15 and over completed five or more years of schooling (Thailand, National Statistical Office, 1978).

During the twentieth century, Thailand experienced a relatively rapid rate of population growth. From a population estimated to be approximately 8 million at the time of the first census in 1911, Thailand grew to approximately 47 million by 1980. Much of this growth can be attributed to a rapid decline in mortality that preceded and then accompanied decline in fertility. One recent set of estimates indicates a fairly steady decline in the crude death rate since 1920, with the exception of the turbulent years during the Second World War (Economic and Social Commission for Asia and the Pacific, 1976). Expectation of life at birth probably increased by some two or three years between the mid-1960s and the mid-1970s, reaching about 58 years for males and 64 years for females by the end of the period. An important component of the improved mortality, since 1960 at least, has been a reduction in infant and child mortality (National Research Council, 1980). Recent trends in the former are summarized in Table 2 for the national as well

TABLE 1 Selected Social and Economic Indicators of Development: Thailand, East Asia and Pacific, and Developing Countries

Indicator	Thailand	East Asia and Pacific	All Developing Countries
GNP per capita (U.S. $), 1978	490	654	623
Percent annual growth in GDP per capita, 1970-77	4.0	5.7	3.2
Energy consumption per capita (kilograms of coal equivalent), 1977	327	466	507
Percent urban	14	30	29
Percent of labor force engaged in agriculture	77	51	49
Percent of total labor force that are women	47	35	25
Percent of dwellings with access to electricity	25	--	48
Radios per 1,000 population	131	92	64
Food consumption per capita (calories per day), 1977	1,929	2,231	2,290
Percent of population with access to safe water	22	22	42
Population per physician	8,370	3,509	4,638
Infant mortality rate (per 1,000 live births)	68	41	48
Life expectancy at birth	61.0	60.8	54.0
Percent of primary school enrollment rate	83	98	78
Percent of secondary school enrollment rate	26	39	23
Percent of adult literacy rate	82	84	52

Notes: Indicators not dated represent the most recent estimate as of 1980. Developing countries are defined in this table according to the World Bank definitions as used in the source and thus exclude centrally planned economies (including China) and capital-surplus oil-exporting countries.

Sources: World Bank (1980b, 1980c).

as the rural and urban populations. Direct estimates based on the dual-record system methodology of the two Surveys of Population Change agree reasonably well with indirect estimates based on the proportions dead among children ever born as reported in various sources. Both indicate moderate declines in infant mortality at the national level between the mid-1960s and mid-1970s. At the same time, they point to substantial and persistent differences in infant mortality between the rural and urban populations. The chance of a rural infant dying before reaching age 1 remains two to three times greater than for an infant of urban parents.

TABLE 2 Direct and Indirect Estimates of Infant Mortality by Place of Residence: Thailand

Type of Estimate and Source	Approximate Years to Which Estimate Applies	Infant Mortality per 1,000 Births		
		National	Rural	Urban
Direct Estimates				
First SPC	1964-65	84[a]	86	68[a]
Second SPC	1974-76	52	59	20
Indirect Estimates				
1970 Census	1966	70	74	31
Second SPC (Round 1)	1970	61	65	27
CPS1/NS (average)	1975	55[b]	59	26[b]
CPS2	1977	52	55	31

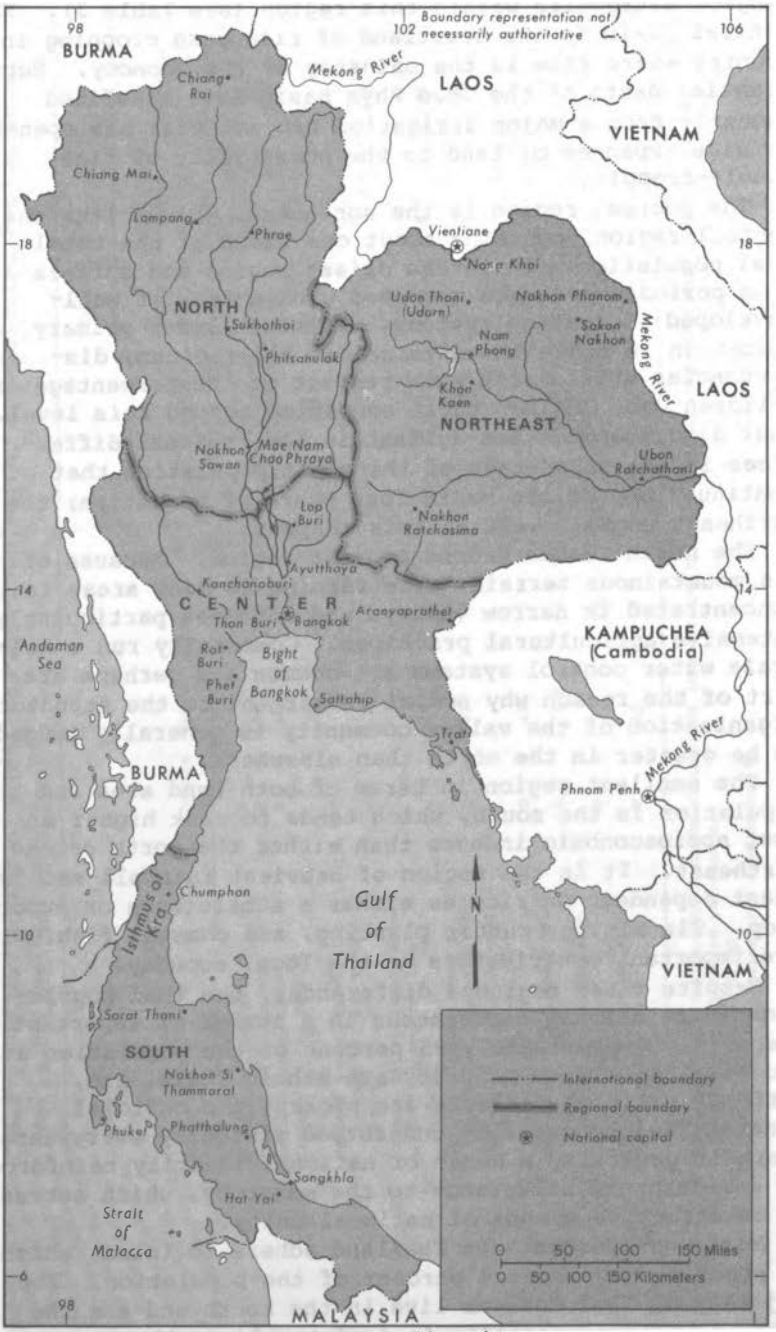
Notes: For full names of surveys, see Table 4. The indirect estimates of infant mortality were obtained from the North family of model life tables corresponding to indirect estimates of $_2q_0$, $_3q_0$, and $_5q_0$. For a description of the method of calculating the indirect estimates, see Knodel and Chamratrithirong (1978). Direct estimates are based on a dual-record methodology.

[a]Excluding Bangkok-Thonburi.
[b]Excluding provincial urban for CPS1.

Sources: Thailand, National Statistical Office (1978); Knodel and Chamratrithirong (1978); Kamnuansilpa and Chamratrithirong (1982); and additional calculations for the CPS1/NS results.

The patterns of rivers and mountains divide Thailand into four more or less natural regions: the mountainous north; the northeast, consisting primarily of the Korat Plateau; the central region, consisting primarily of the Chao Phya Basin; and the south, consisting of the long peninsular extension of Thailand south from the Chao Phya Basin to the Malaysian frontier (see Map). To varying extents, cultural and socioeconomic differences characterize these four regions. In the north, the Thai Yuan dialect is common; in the northeast, Thai Lao is prevalent; while in the south, the southern Thai dialect and Malay (especially among Moslems) are common. At the same time central Thai, the official language, is widely known throughout the country.

On most socioeconomic measures, the central region ranks highest, in part because of the inclusion of the



Source: Bunge (1981).

Bangkok metropolis within this region (see Table 3). The central plain is the heartland of rice cash cropping in a country where rice is the mainstay of the economy. Substantial parts of the Chao Phya Basin have benefited recently from a major irrigation project that has opened up wide expanses of land to the possibility of rice double-cropping.

The poorest region is the northeast, which, like the central region, contains about one third of the total Thai population. It is the driest region and suffers from periodic droughts combined with a lack of well-developed irrigation systems. Although lower primary education is close to universal in all regions, discrepancies still exist with respect to the percentage of children who continue their education beyond this level. Past discrepancies are evident in the regional differences in the percentage of the adult population that continued beyond the basic four years of education; the northeast ranks lowest in this respect.

The north is the second poorest region. Because of its mountainous terrain, rice farming in many areas is concentrated in narrow valleys and involves particularly intensive agricultural practices. Communally run small-scale water control systems are common and perhaps are part of the reason why social commitment to the structural organization of the valley community is generally judged to be greater in the north than elsewhere.

The smallest region in terms of both land area and population is the south, which tends to rank higher on most socioeconomic indexes than either the north or the northeast. It is the region of heaviest rainfall and is least dependent on rice as either a subsistence or export crop. Tin mining, rubber planting, and coastal fishing are important contributors to the local economy.

Despite these regional differences, the Thai population is relatively homogeneous in a number of important respects. Approximately 95 percent of the population are Buddhist, the large majority are ethnic Thais, and, although regional dialects are spoken, the official central Thai language is understood virtually everywhere. There is generally a sense of national identity reinforced by a widespread allegiance to the monarchy, which serves as an effective symbol of national unity.

Most non-Buddhists in Thailand adhere to Islam, which is practiced by about 4 percent of the population. The majority of Thai Moslems live in the south and are the majority or near majority in 4 of the 14 southern

TABLE 3 Distribution of Land Area and Population, and Selected Socioeconomic Indexes by Region: Thailand

Index	Source	Total	North	North-east	South	Central		
						All Central	Excluding Bangkok Metropolis	Bangkok Metropolis
Percent of land area	A	100	33	33	14	20	--	--
Percent of population, 1979[a]	B	100	21	33	13	33	22	11
Percent urban, 1979[a]	B	18	7	4	12	40	10	100
GDP per capita in 1978 (in U.S. $)[b]	C	377	272	156	360	707	566	997
Percent annual growth (in constant prices) in GDP, 1970-76	C	6.3	4.0	5.0	5.5	7.4	7.8	619
Percent of population above official poverty line, 1975-76	C	75	73	64	75	88	87	91
Percent literate among population, aged 10+, 1970	D	82	74	86	75	86	84	90
Percent of population aged 15+ with 5+ years of schooling, 1970	D	11	7	6	11	20	12	39
Age-standardized death rate, 1974-76	E	8.6	9.7	10.3	9.6	6.0[c]	6.4	4.8
Percent of households with radio, 1976	F	74	76	65	64	86	--	--
Percent of households with TV, 1976	F	11	4	3	5	28	--	--

[a]Based on registration data from the Ministry of Interior and thus not strictly comparable with data from the census or projections based on the census.
[b]20.1 baht = U.S. $1.00
[c]Weighted average calculated from Source E.

Sources: A Economic and Social Commission for Asia and the Pacific (ESCAP) (1976).
B Institute of Population Studies (1979).
C World Bank (1980b).
D 1970 Thai census.
E Thailand, National Statistical Office (1978).
F Thailand, National Economic and Social Development Board (1977).

provinces. Of the rural population in the southern region, 25 percent are Moslems according to the 1970 census.

The largest and economically most important ethnic minority in Thailand are the Chinese. While it is difficult to estimate with any precision the proportion represented by ethnic Chinese since there is no agreed-upon definition of Chinese ethnicity and considerable assimilation has taken place, various estimates suggest that they represent 5 to 10 percent of the total population. They are disproportionately concentrated in the urban areas and are predominantly involved in commercial activities. The second largest minority group are the ethnic Malays, who are concentrated in the south and represent perhaps as much as 4 percent of the national population. Other numerically smaller minorities include Indians and Pakistanis who are engaged largely in trade, Cambodians concentrated largely along the border areas near Kampuchea, Vietnamese living largely in the northeast, and a variety of hill tribes located mainly in the mountainous regions, especially in the northwest. In addition, a substantial number of temporary refugees--mainly from Laos and Kampuchea, although also from Vietnam--live in a number of specially established refugee camps.

During most of the present century, Thailand's official stance on population was predominantly pronatalist. As recently as 1956, the government offered bonuses for large families. As a result of a report by a World Bank economic mission in 1959 recommending that the government seriously consider the adverse effects of high population growth on economic development, the official position started to change. Pressures for a change were reinforced by the return of a number of Thai scholars who had studied demography and population matters abroad. A series of events during the 1960s led to the adoption by the Thai Cabinet in 1970 of a formal population policy aimed at slowing down population growth. An important part of this policy was to support voluntary family planning through an official government program. Despite several changes of government during the 1970s, the antinatalist policy remains intact. When a new constitution was drafted in 1974, it explicitly recognized the importance of population development for the nation's welfare. This recognition was reinstated in the present constitution drafted in 1978. The development of population policies since 1960 has been thoroughly reviewed in a recent study

published by the United Nations (1979). A detailed description of the history and current status of governmental and privately organized family planning activities has recently been completed by Bennett et al. (1982).

Administratively, the country is currently divided into 72 provinces (changwat) and the Bangkok metropolis. The provinces are further subdivided into districts (amphur), subdistricts (tambol), and villages (muban). Moreover, certain areas are designated as municipalities, which together with the Bangkok metropolis make up what is usually considered the urban population. Prior to its formation in 1971, the Bangkok metropolis consisted of two separate provinces, each of which contained certain areas classified as rural. For this reason, the definition of urban employed in a number of sample surveys utilized in the present study corresponds to the population living inside municipalities or the formerly urban sections of the Bangkok metropolis while the remaining population is defined as rural. In other surveys, the entire population of the Bangkok metropolis is treated as urban.

The usual practice of limiting the definition of the urban population outside the Bangkok metropolis to residents of politically defined municipalities has been criticized recently as being unrealistically narrow (Robinson and Wongbuddha, 1980). Indeed, a case can be made for making a finer distinction between rural and urban than is implied by a simple dichotomy, and several studies based on a 1-percent sample from the 1970 census have done so (Goldstein and Goldstein, 1978; Sermsri, 1980). In the present study, however, it is not possible to employ a scheme for distinguishing rural and urban different from that incorporated in the data sources used.

SOURCES OF DATA

The situation of Thailand is unusually favorable in comparison to most developing countries with respect to the availability of data for the study of fertility levels, trends, and determinants. These data are generally of reasonable quality, come from a variety of sources, and cover most of the period during which the fertility decline has taken place. Population censuses of varying demographic content have been held since 1911 with decennial censuses taking place in 1960, 1970, and 1980. A registration system for births and deaths has

been in existence since early in the century, although the data yielded by this system have been and continue to be incomplete. Most important for the study of determinants of fertility, however, have been a series of sample surveys conducted during the last decade and a half, which were designed specifically to study fertility or some closely related aspect of behavior. While in the present study we attempt to draw on information from any relevant source, our analysis is based largely on data from these sample surveys.

A list of the surveys, the abbreviation used to refer to them, the dates on which the field work took place, and a brief comment on the sample coverage are provided in Table 4. Some of these surveys are national in scope while others are regional or directed at specific subgroups of the population. A more detailed summary of the surveys upon which we draw most heavily is provided in the appendix. As we point out there, the samples vary in the extent to which they are comparable, even for those that roughly attempt to attain national coverage. Nevertheless, we believe the results of at least a number of these surveys are sufficiently comparable to enable us to both trace the trends in various determinants of fertility over time and to compare interrelationships at different stages of the fertility decline.

The surveys that will be used most intensively for these purposes are LS1, LS2, SOFT, CPS1, NS, AFPH, and CPS2. With the exception of AFPH, these surveys are more or less national in scope and in the case of AFPH, as discussed in the appendix, the 20 provinces from which the sample was drawn are sufficiently similar in a number of important respects to the total country that we feel justified in treating it essentially as a national sample as well.

The reader should be aware, however, of several of the more problematic aspects of making comparisons across these series of surveys. The most serious problem is making comparisons among the urban sections of the samples. This is true for two reasons. First, the number of urban respondents is quite small in the cases of SOFT, CPS1, NS, and, to a lesser extent, CPS2, since these surveys were intended to be self-weighting with respect to the rural and urban sectors of the population. Second, the universes from which the urban samples were drawn were not uniform with respect to the inclusion of provincial urban areas and the Bangkok metropolis and, in case of the latter, the surveys differ with respect to

whether all or only part of the area is treated as urban. In particular, the urban sample for CPSI was drawn exclusively from the Bangkok metropolis including the areas of the metropolis that are defined as rural in LS1, LS2, SOFT, and NS, while the AFPH urban sample excludes the Bangkok metropolis (since it is based on a universe of only 20 provinces). In cases where the rural and urban sectors of the sample were based on differing sample fractions, results for the total sample are appropriately weighted. Note should be made, however, that in the case of LS1 and LS2, there was a year's lag between the rural and urban phases. National estimates for LS2 are thus based on a combination of the 1969 rural sample with the 1970 urban sample, and LS2 on a combination of the 1972 rural sample with the 1973 urban sample.

Several conventions were followed in preparing the tables included in this study. When referring to the dates of surveys, hyphenated years will be reserved for those strictly representing coverage of a span of years, such as SPC2 for 1974-76. Years separated by a slash indicate either a survey that is primarily cross-sectional but whose field work spanned two calendar years such as CPS1 (1978/79) or combined results from two component cross-sectional surveys taking place in successive years such as LS1 (1969/70) and LS2 (1972/73). Many of the tables were derived from original tabulations not published elsewhere. In such cases, the source is simply indicated as the survey itself. Only when tables or parts of tables were derived from previous publications or manuscripts in process are references made to a bibliographical source.

PLAN OF ANALYSIS

In their seminal article on intermediate fertility variables, Davis and Blake (1956) made a major contribution to the conceptualization of fertility determinants by specifying variables through which and only through which all other fertility determinants--be they socioeconomic, cultural, or environmental--must operate. These intermediate variables are the only ones that directly affect fertility and thus can be considered the proximate determinants. Recent work by Bongaarts (1978) provides a simple analytic accounting framework in which a change in fertility can be related to changes in

TABLE 4 Selected Surveys Providing Information on Fertility or Fertility Determinants: Thailand

Abbreviation	Full Name	Date of Major Fieldwork	Sample Coverage
SPC1	Survey of Population Change, 1964-67	Mid-1964 to mid-1967 (usually only results for first years cited)	National except for exclusion of Bangkok-Thonburi
LS1	Longitudinal Study of Social, Economic, and Demographic Change - Round 1	Rural - April/May 1969 Urban - April/May 1973	National except for exclusion of sensitive areas and predominantly Muslim provinces in south
LS2	Longitudinal Study of Social, Economic, and Demographic Change - Round 2	Rural - April/May 1972 Urban - April/May 1973	National except for exclusion of sensitive areas and predominantly Muslim provinces in south
SPC2	Survey of Population Change, 1974-76	Mid-1974 to mid-1976	National
SOFT	Survey of Fertility in Thailand (part of WFS)	April/May 1975	National
WRPS	Westinghouse Rural Population Survey	1975	National rural sample with various exclusions
VOC	Value of Children Study	April/May 1976	National
FPHH	Family Planning Health and Hygiene Baseline Study	July/August 1977	Northeast region

NTFS	Northern Thai Fertility Survey	November 1976/January 1977	Rural sample of Chaing Mai and Chiang Rai provinces
CPS1	Contraceptive Prevalence Survey - Round 1	December 1978/January 1979	National except for exclusion of provincial urban places
AMS	Asian Marriage Survey (Thailand)	December 1978/May 1979	Bangkok general, Bangkok slum, (Klong Toey) and a semi-rural area in Central region (Ang Thong)
NS	National Study of Family Planning Practices, Fertility, and Mortality	April/May 1979	National except for exclusion of sensitive areas and predominantly Muslim provinces in south
AFPH	Accelerated Family Planning and Health Project Baseline Survey	October/November 1979	The 20 provinces selected for inclusion in the Accelerated Family Planning and Health Project
NES	Northeast Survey	April/June 1980	Rural northeast region
CPS2	Contraceptive Prevalence Survey - Round 2	April/June 1981	National

Note: The analysis depends most heavily on LS1, LS2, SOFT, CPS2, NS, AFPH, and CPS1; more detailed information on each is provided in the Appendix.

the proximate determinants. Empirically, Bongaarts (1980b) has found that four proximate determinants--marriage pattern, contraceptive use and effectiveness, prevalence of induced abortion, and duration of lactational infecundability--account for nearly all the variations in fertility levels among populations. The main focus of the present study is on the proximate determinants, including, but not limited to, the four Bongaarts found to be of such importance. We also apply his accounting scheme to our results for Thailand. Although there are considerable differences in both the amount and quality of information available for Thailand on the different proximate determinants, at least some information is available for most. Before turning to the proximate determinants, however, we review in Chapter 2 recent trends in current fertility, including trends in the open birth interval and percent of women reporting themselves as currently pregnant. In addition, we discuss the relative contribution of age and marital structure to changes in the crude birth rate, the changing age structure of marital fertility, and trends in completed and expected family size.

Bongaarts (1978) has grouped proximate fertility determinants into three broad categories, namely, factors relating to exposure, to natural marital fertility, and to deliberate marital fertility control. We divide our discussion of proximate determinants along these lines. In Chapter 3 we explore family formation and dissolution or, in Bongaarts's terminology, exposure factors. In Chapter 4, we cover a variety of natural marital fertility factors: specifically the limits of the childbearing span as determined by age at menarche, menopause, and last birth; primary sterility; coital frequency; and lactational infecundability. Deliberate marital fertility control is treated in Chapter 5, which deals specifically with contraception and abortion as well as examining the extent to which adoption practices serve to limit family size. Based on the accounting scheme proposed by Bongaarts, an attempt is made in Chapter 6 to assess the contribution of several key proximate determinants to the recent levels and changes in Thai fertility.

In Chapter 7 we turn to a limited discussion of attitudes related to reproduction that we believe are particularly important for understanding recent and future fertility trends. Our focus is on trends in desired family size, preferences for the sex composition

of children, and attitudes toward deliberate birth control, the major proximate variable responsible for the fertility decline. Chapter 8 consists of a largely descriptive presentation of differentials in several aspects of reproductive behavior and attitudes by education, income, and religion. To a limited extent, fertility differentials are related to differentials in several key proximate determinants. Finally, Chapter 9 provides a summary and some concluding comments.

CHAPTER 2

RECENT TRENDS IN FERTILITY AND FAMILY SIZE

Deficiencies in the vital registration system and the absence of fertility surveys prior to the mid-1960s make it difficult to pinpoint with any certainty the precise year in which fertility rates turned downward in Thailand. While an occasional analysis suggests that the crude birth rate may have started a protracted decline in the mid-1950s (Vallin, 1976), the bulk of the evidence suggests that there was little or no momentum in the fertility decline at the national level prior to the 1960s. According to the extensive study of recent fertility trends by the National Research Council (1980), the level of fertility as measured by the total fertility rate was in the range of 6.3 to 6.6 births per woman in the early 1960s and began to decline fairly sharply in the mid-1960s reaching a level of 5.4 to 5.8 in 1970, and 4.5 to 4.9 by 1975. Several sources of estimates indicate an acceleration of fertility decline in the early 1970s, although the evidence on this is not conclusive. The Panel concluded that urban fertility was probably already declining by 1960 and continued to decline thereafter, while rural fertility probably remained relatively constant until the second half of the 1960s and then began a rapid decline.

Based on the estimates of total fertility and child and adult mortality, the Panel estimated the crude birth and death rates and thereby derived a rate of natural increase for the Thai population. The ranges of total fertility cited above correspond to crude birth rates of 43 to 46 births per 1,000 population for the early 1960s, 36 to 38 by 1970, and 32 to 36 by 1975. More recent evidence indicates a continuation of the fertility decline since 1975. Thus, by 1980 the rate of natural increase was probably around 2 percent, down from over 3

percent in the early 1960s and the 2.3 to 2.6 percent in 1975 estimated by the Panel.

NATIONAL, RURAL-URBAN, AND REGIONAL FERTILITY TRENDS

First in the mid-1960s and then again in the mid-1970s, the National Statistical Office attempted to estimate fertility and mortality parameters and the completeness of vital registration through a dual-record system approach. These efforts, called the Surveys of Population Change (SPC1 and SPC2), provide estimates of total fertility. In addition, total fertility can be estimated from a series of single, cross-sectional national sample surveys based on retrospectively reported births to married women. In addition to the differences in the methodologies involved, these estimates are based on far smaller samples than either Survey of Population Change. In addition, they are sensitive to the marital structure used to convert the age-specific marital fertility rates into age-specific rates. Nevertheless, the estimates from these two different types of sources fit together reasonably well, at least for the period between the mid-1960s and mid-1970s (see Table 5 and Figure 1).[1] A comparison of SPC1 and SPC2 suggests a 22-percent decline in total fertility between the mid-1960s and the mid-1970s, while the series of single surveys suggests a decline in total fertility in the neighborhood of 40 percent during the decade or so following the end of the 1960s. The most recent survey (CPS2) indicates a somewhat higher total fertility rate than the two immediately previous surveys (NS and CPS2) taken about two years earlier. While a genuine increase in fertility cannot be ruled out conclusively, sampling error and differences in the questions and approaches used to derive these rates may well account for the apparent rise (for example, Kamnuansilpa et al., 1982). Evidence on the percent pregnant points to a decrease rather than an increase in fertility in the intervening period (see below). In addition, the prevalence of contraceptive use increased (see Chapter 5).

Since the collection of fertility data was restricted to married women in the single surveys (with the exception of CPS1), they serve as a more appropriate basis for estimating marital fertility than total fertility. A convenient summary measure of marital fertility is provided by an age-standardized index

TABLE 5 Total Fertility Rates and Age-Standardized Marital Fertility (I_g'): Thailand

Year of Survey	Survey	Total Fertility Rate, National: Dual-Record System	Total Fertility Rate, National: Single Survey	Marital Fertility (I_g') from Single Surveys: National	Rural	Urban
1964-65	SPC1	6.30[a]				
1969/70	LS1		6.12	.72	.77	.53
1972/73	LS2		5.30	.64	.67	.51
1975	SOFT		4.52[b]	.57	.58	.50
1974-76	SPC2	4.90				
1978/79	CPS		3.77	.44[c]	.44	.45[d]
1979	NS		3.38	.44	.44	.40
1981	CPS2		3.91	.46	.46	.46

Notes: Fertility rates for the single surveys refer to births during the 12 months prior to the survey. The total fertility rate for LS1 was derived by multiplying age-specific marital fertility by proportions currently married as interpolated between the 1960 and 1970 censuses after adjusting the 1960 census for one-half year age misstatement; total fertility rates for LS2, SOFT, and NS were derived by multiplying age-specific marital fertility by the proportions currently married estimated by interpolation between the 1970 census and the preliminary 1-percent sample of the 1980 census.

[a]Excludes Bangkok-Thonburi.
[b]This estimate differs from published estimates reported in Knodel and Piampiti (1978) because it is based on births 12 months prior to the survey, (rather than births during the calendar year 1974) and because it incorporates marital structure as interpolated between the 1970 and 1980 censuses.
[c]Excludes provincial urban.
[d]Bangkok metropolitan area.

Sources: Thailand, National Statistical Office (1978); Kamnuansilpa and Chamratrithirong (1982) (plus personal communications from Anne Cross); Kamnuansilpa et al. (1982); Knodel et al. (1980).

labeled Ig'. This measure expresses the level of observed fertility as a ratio to the highest marital fertility on reliable record (that of the Hutterite population of North America) after directly standardizing for age.[2] The results from this series of surveys clearly indicate a sharp fall in marital fertility during the period under observation. See the last three columns of Table 5 and Figure 2. The CPS2 data seem to suggest a halt to the decline and even a slight increase in marital fertility when compared to the immediately prior surveys; however, as discussed above, this may be more an artifact of the data and sampling error than a genuine change in

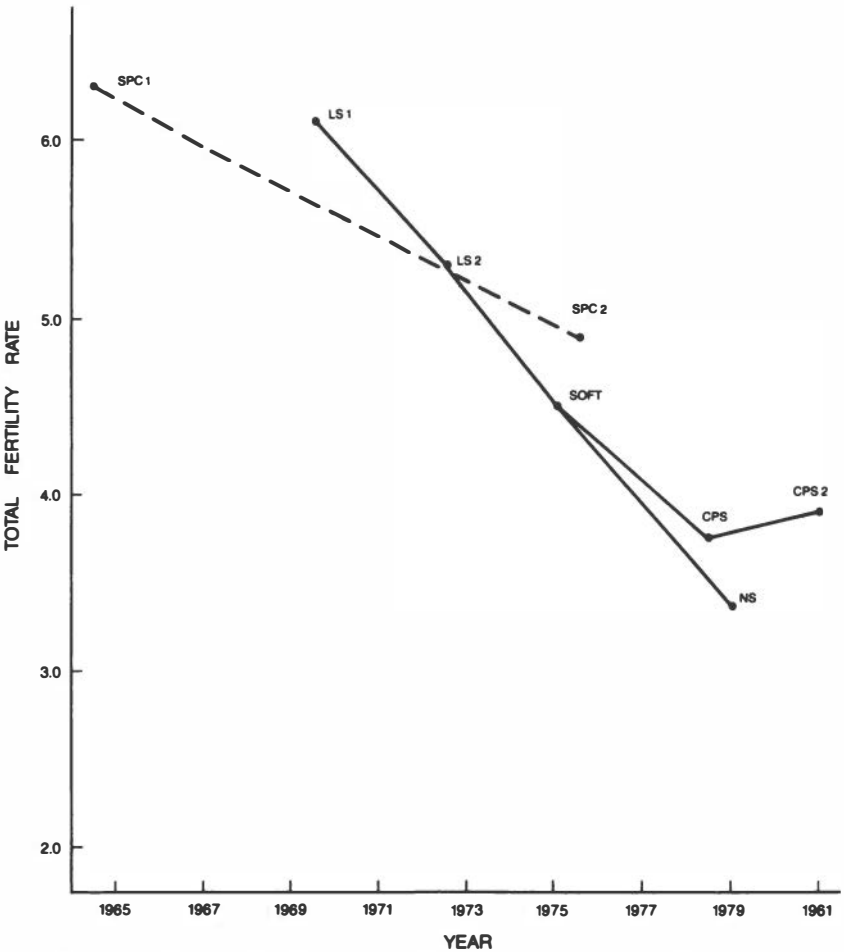


FIGURE 1 Total Fertility Rate from Surveys, 1964-65 to 1981: Thailand

Note: See notes to Table 5.

trend. Even if the higher estimates of CPS2 are accepted, Ig' at the national level has declined by almost 40 percent since the late 1960s, thus representing one of the most rapid fertility reductions in the developing world. The decline in rural marital fertility is even larger than for the country as a whole with the result that the pronounced urban-rural differential evident at the end of the 1960s had been eliminated by the early 1980s.

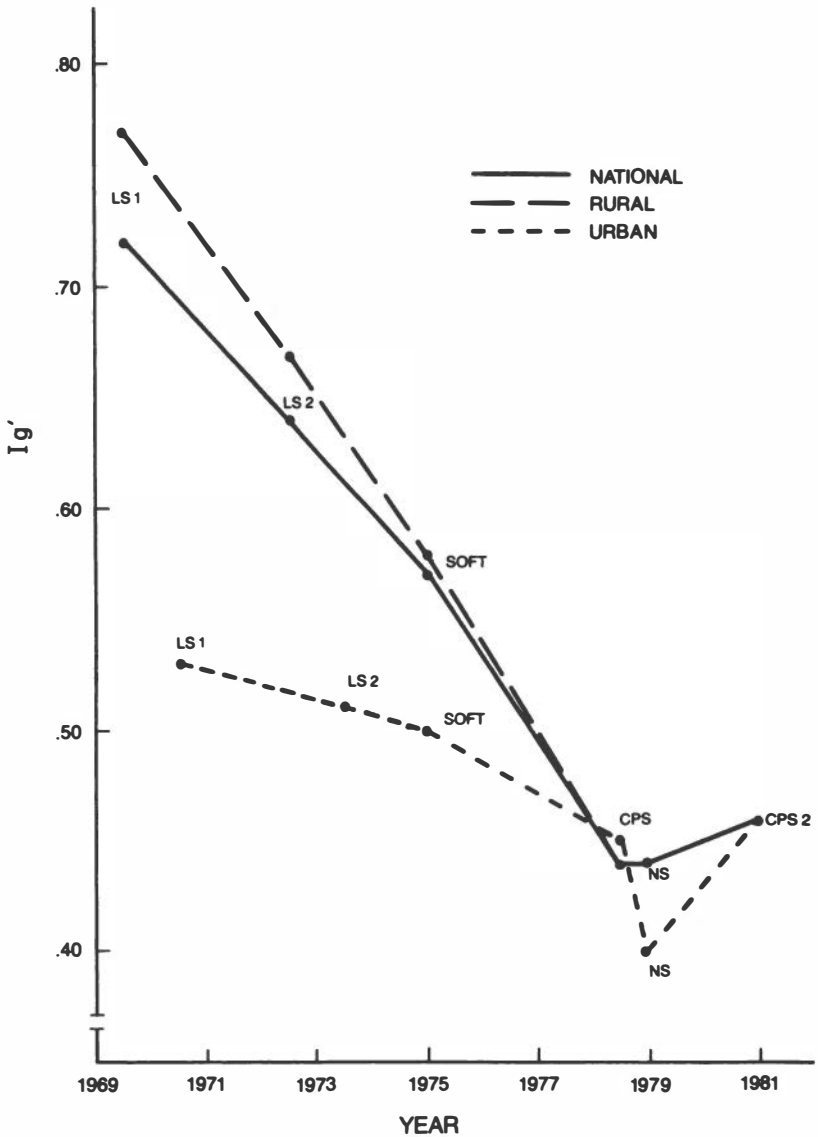


FIGURE 2 Age-Standardized Marital Fertility (I_g') from Selected Surveys, 1969-70 to 1981: Thailand

Note: See notes to Table 5.

According to the National Research Council (1980) report, the national fertility decline up to 1975 was largely a result of rapid reductions in the central and northern regions of Thailand with much less change evident in the northeastern and southern regions. A comparison of the first and second Surveys of Population Change clearly indicates such a regional difference in fertility decline between the mid-1960s and mid-1970s (see Table 6). More recent evidence, however, indicates that the situation has changed since 1975 and that a fertility decline is now clearly under way in the northeast. The evidence for the south is mixed with respect to recent fertility change, undoubtedly due to the small proportion of any self-weighting national sample that comes from this region. Evidence for the south from CPS1 and NS, but not CPS2, suggests that fertility decline there lags behind the rest of the country. The regional results from the national single surveys must be considered only suggestive, since in most cases the samples were not designed to yield regional

TABLE 6 Total Fertility and Age-Standardized Marital Fertility (I_g') by Region: Thailand

	Central, Excluding Bangkok	North	North-east	South
I. Total fertility rates from Survey of Population Change				
1964-65	5.90	6.47	6.61	6.02
1974-76	4.11	3.74	6.25	6.12
	Rural Only			
II. Marital fertility one year prior to surveys from single surveys (I_g')				
1975 (SOFT)	.54	.43	.68	.66
1977 (FPHH)[b]	--	--	.62[a]	--
1978/79 (CPS)	.46	.33	.45	.58
1979 (NS)	.45	.32	.44	.72
1980[c] (NES)[b]	--	--	.48	--
1981 (CPS2)	.47	.37	.49	.49

[a]Includes provincial urban.
[b]Surveys conducted in northeast only.
[c]Refers to births from January to December 1979.

Sources: Thailand, National Statistical Office (1978); Knodel et al. (1980); and unpublished tabulations.

estimates. In the case of the northeast, however, the recent decline in fertility is further confirmed by two large regional surveys (FPHH and NES). The rapid process and advanced stage of fertility reduction in the central and north regions have been documented in several other sources as well (see National Research Council, 1980; Shevasunt and Hogan, 1979; Pardthaisong, 1978). Calculations based on the Northern Thai Fertility Study, which refers to the rural population of two provinces in the north, indicates that Ig' declined from 0.51 in 1968-72 to 0.40 in 1973-76. This latter figure falls between the results indicated for the north from SOFT and CPS or NS.[3]

THE IMPACT OF AGE AND MARITAL STRUCTURE ON THE BIRTH RATE

In some countries, changes in the age structure have had a measurable effect on facilitating or hindering fertility decline when measured in terms of the crude birth rate or other indexes sensitive to age distribution. Moreover, in countries where most fertility is legitimate, changes in the marital status composition of the population can have a considerable impact on overall fertility, above and beyond the impact of changes occurring in marital fertility. Thus, in trying to account for changes in the overall level of fertility, marital status is an important factor to take into account. In the case of Thailand, changes in the age and marital status distributions do not appear to be of great importance during the period of fertility decline, although inconsistencies in the evidence regarding changes in nuptiality patterns make it difficult to estimate the contribution of the latter with much precision. The proportion of the population that comprises women in the reproductive ages remained relatively unchanged between 1960 and 1970 but shows evidence of increasing over the following decade, especially since 1976, as would be expected as a result of the earlier sharp decline in fertility (see Table 7). The age distribution of women within the reproductive span has remained relatively stable during the entire two decades between 1960 and 1980 and is not expected to be influenced by recent fertility trends for another ten years. Thus it seems safe to conclude that changes in fertility measures that are sensitive to age distribution have been largely unaffected by shifts in age structure

TABLE 7 Age Distribution of Women in the Reproductive Ages Expressed as Percent of Total Population and as Percent of All Women Aged 15-49: Thailand

Age Group	Percent of Total Population					Percent of Women 15-49				
	Census 1960	SPC1 1965	Census 1970	SPC2 1976	Census 1980[a]	Census 1960	SPC1 1965	Census 1970	SPC2 1976	Census 1980[b]
15-19	4.7	5.0	5.5	5.8	6.0	20.3	22.2	24.2	24.1	23.4
20-24	4.6	4.0	4.0	4.5	5.1	19.8	18.0	17.5	19.0	19.8
25-29	4.0	3.7	3.3	3.5	4.1	17.2	16.3	14.7	14.8	15.9
30-34	3.3	3.2	3.1	2.8	3.1	14.3	14.2	13.8	11.9	12.2
35-39	2.6	2.7	2.8	2.8	2.7	11.2	12.0	12.3	11.7	10.4
40-44	2.2	2.1	2.2	2.4	2.5	9.3	9.3	9.8	10.1	9.8
45-49	1.8	1.8	1.7	2.0	2.2	7.9	7.9	7.7	8.3	8.4
15-49	23.2	22.4	22.7	23.9	25.7	100.0	100.0	100.0	100.0	100.0

Note: Persons of unknown age have been proportionately distributed.

[a]Based on 1-percent sample assuming sex ratio of total population is the same as reported in SPC2.
[b]Based on 1-percent sample.

Sources: 1980 census from unpublished preliminary tabulations of the 1-percent sample; all others calculated from official published reports.

during the period between 1960 and the mid-1970s, but that the influence of such changes is beginning to and will continue to be of some importance in the near future.

Data on the proportions single as recorded from 1947 on in the censuses and in several surveys are summarized in Table 8 and Figure 3 presents the trend 1960-80 for two age groups, 20-24 and 45-49. Age was determined in a somewhat different manner in the 1947 and 1960 censuses compared to the later censuses and surveys. Thus, the 1947 census is directly comparable with the 1960 census as reported, but neither is directly comparable with the later sources. For this reason, results from the 1960

TABLE 8 Proportions Single and Singulate Mean Age at Marriage (SMAM) by Sex and Age Group from Selected Sources: Thailand

Sex and Age Group	Census 1947	Census 1960 Reported Ages	Census 1960 Adjusted Ages	Census 1970	SOFT 1975	SPC2 1975	Census 1980[a]
Females							
15-19	.806	.862	.830	.810	.846	.786	.835
20-24	.300	.387	.352	.379	.415	.359	.428
25-29	.109	.141	.126	.156	.192	.156	.206
30-34	.057	.067	.062	.081	.101	.081	.069
35-39	.040	.042	.040	.053	.064	.048	.079
40-44	.032	.031	.030	.039	.039	.032	.054
45-49	.029	.026	.026	.030	.033	.015	.044
SMAM	21.06	22.10	21.64	21.97	22.46	21.96	22.45
Males							
15-19	.967	.976	.959	.963	.969	.957	.960
20-24	.606	.699	.663	.651	.639	.623	.646
25-29	.242	.270	.242	.249	.259	.257	.266
30-34	.104	.098	.088	.106	.081	.097	.115
35-39	.069	.053	.050	.058	.059	.062	.060
40-44	.050	.037	.036	.038	.028	.040	.042
45-49	.044	.032	.032	.032	.024	.033	.027
SMAM	24.32	25.02	24.52	24.67	24.77	24.42	24.83

Note: Persons of unknown marital status have been proportionately distributed except for male priests who are treated as single.

[a]Based on 1-percent sample.

Sources: National Research Council (1980); United Nations (1956); and unpublished preliminary tabulations of the 1-percent 1980 census sample.

census are presented both as reported and in an adjusted form which increases their comparability to later sources.[4] A comparison of the 1947 and unadjusted 1960 census results indicates that a moderate increase took place in the proportion single among women and men in the younger reproductive ages. This may have contributed to some reduction in the crude birth rate in the 1950s, although, as indicated above, estimates of fertility prior to 1960 are tenuous. Since 1960, most, but not all, evidence points to a continuation of the trend toward increasing proportions single, especially among women. A moderate continuation of the increase in proportion single among women at most ages, but particularly in the twenties, is indicated by a comparison of the 1960 (adjusted), 1970, and preliminary 1980 census results. In contrast, evidence from SPC2 suggests a relative lack of change. Results from SOFT for 1975, however, generally show proportions single among women that are consistently higher than the 1970 census and only slightly below those in the 1980 census. Proportions single among males show less variation across different sources than for women and appear to have remained relatively constant between 1960 and 1980; there is only a slight tendency toward increase evident at ages 25 and above.

The singulate mean age at marriage, an estimate of the age at first marriage derived from the proportions single by age, registers a 0.8 year increase for women and a 0.3 year increase for men between the adjusted 1960 census results and the preliminary 1980 results (see Table 8 and Figure 3). Results from SPC2, however, do not fit into this trend and suggest rather that the mean age at marriage may not have risen so much or perhaps not at all. In contrast, the results for women from SOFT indicate an age at marriage almost as high as that implied by the 1980 census preliminary results. If more weight is given the census results, the evidence points to a modest trend toward increasing proportions single and rising age at first marriage since 1960, especially for women. The contradictory evidence provided by SPC2, indicating little trend in proportions single, cannot be dismissed conclusively, however, given the large sample size on which it is based and the apparent problems associated with the 1980 census.[5] Moreover, analyses presented in the next chapter based on retrospective reports of age at first marriage from several surveys also point to little change.

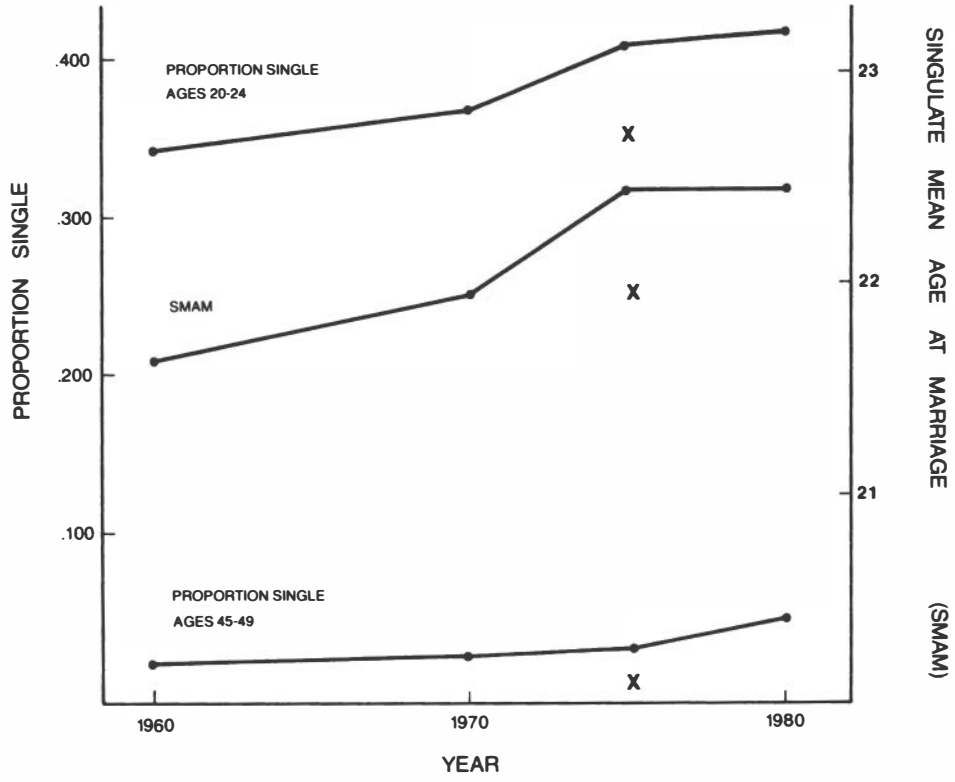


FIGURE 3 Proportions Single in Age Groups 20-24 and 45-49 and Singulate Mean Age at Marriage from Censuses and Two Surveys, 1960-80: Thailand

Sources: • 1960, 1970, 1980 censuses and 1975 SOFT; x 1975 SPC 2.

In Thailand, there is little difference between men and women in their age at first marriage. Judging from the singulate mean age at marriage, men are only about two and one-half years older than women when they marry for the first time. This is a small difference compared to many other developing countries, where the mean age difference between spouses can be as large as eight years, as in the case of Bangladesh (Durch, 1980; Smith, 1980). In natural fertility populations, age differences between spouses can exert a significant influence on marital fertility levels, with the marital fertility of women at any given age generally being inversely related to the age of their husbands (Knodel, 1982). In the case of Thailand, however, where birth control within marriage has become extensive, the age difference between spouses is unlikely to be an important factor in explaining fertility levels.

So far, our discussion of fertility trends has been in terms of the total fertility rate or the age-standardized index of marital fertility. The two Surveys of Population Change have also yielded estimates of the crude birth rate. According to these estimates, the crude birth rate declined from 42.2 in 1964-65 to 35.6 in 1974-76, a decline of about 16 percent during the intervening decade. Using a statistical technique reported by Cho and Retherford (1973), it is possible to decompose his change in the crude birth rate into the amount due to changes in (1) age-sex structure; (2) marital structure (i.e., percent married in each age group); and (3) age-specific marital fertility rates. Since not all the data required for this decomposition were available directly from the reports of the Surveys of Population Change, data from several sources were combined for this purpose.[6] As already pointed out, however, SPC2 indicates lower proportions single for women than found by SOFT or implicit in the trend between the 1970 and 1980 censuses. If the SPC2 proportions single (and thus proportions married) are unrepresentative, results of the decomposition exercise will be misleading and will not reflect the contribution of increased delay of marriage to the decline in the birth rate. We have therefore made a second set of calculations assuming that the proportions currently married in 1975 (the midpoint of SPC2) were not as recorded in SPC2 itself but rather equal to the average value of those indicated by the 1970 and 1980 censuses (since SPC2 took place midway between the censuses).[7] Combining the

alternative proportions currently married with the observed age structure and fertility rates would imply that the crude birth rate for 1974-76 had fallen somewhat more than actually observed, to 33.1 per 1,000 population.[8]

The specific results are as follows:

Percent Contribution with 1975 Marital Structure

Contribution from Changes	As Observed in SPC1	As Implied by 1970 and 1980 Censuses
Age-sex structure	+19	+15
Marital structure	+15	-14
Age-specific marital fertility	-134	-101
Total	-100	-100

The results indicate that changes in both the age-sex structure and the marital structure of the population are relatively small compared to changes in marital fertility. If marital structure in 1975 is taken to be as recorded in SPC2, then both age structure and marital structure changed in a manner that would have led to an increase in the crude birth rate between 1965 and 1975 had marital fertility remained constant. Thus the decline in marital fertility not only is responsible for the entire decline in crude birth rate, but it also compensated for changes in the other two factors. Since the contribution of these three factors must add up to 100 percent according to the technique employed and since the changes in the age-sex structure and marital structure would have led to an increase in the crude birth rate, the change in marital fertility, given the marital structure recorded in SPC2, is thus accountable for over 100 percent of the observed decline in crude birth rate. If, in contrast, the 1975 marital status is assumed to have changed as implied by the trend toward increased proportions single, indicated by the 1970 and preliminary 1980 census results, changes in marital structure would have contributed to rather than detracted from the decline in the crude birth rate. The contribution of age-sex structure, however, is still in the opposite direction and of about equal magnitude. According to these calculations, had age,

sex, and marital status distributions remained unchanged between 1965 and 1975, the change in the crude birth rate would have been about the same as actually observed. As a result, the contribution of marital fertility decline is estimated as accounting for almost exactly 100 percent of the change. The main point made by both sets of calculations is that the contribution of changes in marital and age-sex structure to changes in the crude birth rate were relatively minor compared to the reduction in marital fertility.

THE AGE STRUCTURE OF MARITAL FERTILITY

Populations in a state of natural fertility--i.e., where no deliberate attempts are made to limit family size within marriage--can vary substantially in their level of marital fertility. However, despite such variations, it is now well established that they share a relatively similar age pattern of marital fertility, which is determined primarily by the decline of fecundity with age (Henry, 1961; Knodel, 1982). In natural fertility populations, fecundity and thus fertility remain high during much of the woman's reproductive span and it is only with the rapid decline in the ability to bear children during the later reproductive ages that fertility also declines precipitously with increasing age. In contrast, in populations where family size limitation is common, age-specific marital fertility rates tend to show a more rapid decline at earlier ages and to be particularly low at older ages. The reason for this is that most married couples who wish to limit the number of children they have typically concentrate their childbearing in the earlier part of the wife's potentially fertile period. Since the proportion of couples reaching their desired family size increases with age, so do efforts to prevent further births. The result is to lower fertility disproportionately at the later reproductive ages compared to a natural fertility population. One implication of this contrast is that as a population moves away from a state of natural fertility to one in which family limitation is widely and intensively practiced, marital fertility typically declines disproportionately more among older women (Knodel, 1977).

Since a series of national sample surveys in Thailand collected partial or complete birth history data from married female respondents, it is possible to derive

TABLE 9 Age-Specific Marital Fertility During Year Prior to Survey, Coale-Trussell Indexes of Fertility Control (m) and Level (M), and Mean Square Error (MSE) of Estimates of m and M, by Place of Residence: Thailand

Place of Residence and Survey	Year of Survey	Age of Women							m	M	MSE
		15-19	20-24	25-29	30-34	35-39	40-44	45-49			
Rural											
LS1	1969	419	457	374	292	252	198	39	-.08	.85	.028
LS2	1972	417	402	376	211	209	160	19	.03	.77	.048
SOFT	1975	475	371	268	213	181	101	20	.18	.70	.011
CPS	1978/79	318	327	218	134	124	53	33	.52	.61	.019
NS	1979	350	332	206	161	118	51	8	.55	.63	.008
CPS2	1981	321	350	255	156	96	59	8	.61	.69	.022
Urban											
LS1	1970	360	380	306	174	114	82	22	.48	.75	.037
LS2	1973	483	366	293	174	96	28	13	1.10	.88	.006
SOFT	1975	(549)	396	302	110	51	40	18	1.13	.78	.094
CPS[a]	1978/79	(262)	293	302	211	80	0	(0)	.90	.77	.040
NS	1979	(286)	259	239	162	98	15	0	1.20	.73	.085
CPS2	1981	(389)	357	256	174	74	32	0	1.05	.79	.008
Total											
LS1	1969/70	412	442	361	267	228	180	36	-.02	.88	.031
LS2	1972/73	422	397	362	205	190	144	18	.10	.77	.045
SOFT	1975	481	375	273	199	164	93	20	.27	.71	.014
CPS[b]	1978/79	309	320	234	148	116	45	27	.64	.66	.005
NS	1979	343	320	212	161	114	44	7	.63	.64	.004
CPS2	1981	330	351	255	159	92	55	7	.67	.70	.019

Notes: Marital fertility rates are expressed per 1,000 currently married women. Rates in parentheses are based on denominators of fewer than 50 woman years per five-year age group. The Coale-Trussell indexes are based on the age groups 20-24 through 40-44.

[a]Bangkok metropolitan area.
[b]Excluding provincial urban.

Source: CPS2 from Kamnuansilpa and Chamratrithirong (1982).

age-specific marital fertility rates based on the number of births that are reported to have occurred in the year prior to each survey.[9] The resulting series permits an examination of the age pattern of fertility and how it evolved during the course of the recent fertility decline (see Table 9). The expected change in the age pattern of fertility is evident from this series of marital fertility rates. For example, a comparison for the total population of marital fertility rates derived from CPS2, the most recent survey, with those from LS1, which refer to a period approximately a decade earlier, indicate that the marital fertility rate among women aged 20-24 declined by only 21 percent compared to a decline of 69 percent among women aged 40-44.

Coale and Trussell (1974) have developed two indexes that can be used to characterize any given marital fertility schedule. One index, designated m, indicates the extent to which the given schedule departs from the age pattern of a standard natural marital fertility schedule. This index can be referred to as the Coale-Trussell index of fertility control, since the age pattern of marital fertility, as discussed above, reflects the extent of family limitation practiced in the population. The m index is constructed so it will equal zero if the shape of the observed fertility schedule is identical to that of the standard natural fertility schedule. The faster marital fertility falls with age the higher the value of m, which can reach values above 2 in populations where family limitation is extensive. Negative values of m will result if marital fertility falls more slowly with age than in the standard. Another index, designated M, represents a scale factor intended to indicate the underlying level of natural fertility in the observed population relative to the standard marital fertililty schedule and can be referred to as the Coale-Trussell index of fertility level. The M index is designed to equal 1 in situations where the underlying level of natural fertility is the same as that incorporated in the standard schedule. For various reasons, the M index tends to underestimate the underlying level of natural fertility once control becomes common, but it can be a useful measure for comparing the underlying level of natural marital fertility for populations with modest levels of family limitation.

Coale and Trussell (1978) have proposed a procedure for estimating the m and M indexes through ordinary least squares methods. One advantage of this procedure is that

it yields a value for the mean square error of the regression, which can serve as an indication of how well the observed age pattern of marital fertility fits the fertility model on which the Coale-Trussell indexes are based.

In the case of Thailand, based on the age-specific marital fertility rates calculated from the series of surveys included in Table 9, the m index for the country as a whole rises from slightly below zero to close to 0.7 during the period from the end of the 1960s to the start of the 1980s. Thus, marital fertility was transformed from an age pattern consistent with natural fertility to one indicative of moderate fertility control. In addition, the value of the m index is substantially higher for the urban population at every survey than for the rural population. The urban value of the m index for LS1, the earliest survey, already reflects an age pattern of marital fertility consistent with some family limitation.

For the country as a whole, the M index declined steadily during the decade under observation, with the exception of the most recent observation. This should not be taken as an indication that the underlying level of natural marital fertility was actually declining in Thailand. Although the M index is intended to "discount" changes in the extent of family size limitation, it is nevertheless sensitive to changes in the pattern of birth spacing, which, as indicated below, was apparently changing during the decade in question.

The fact that the m and M indexes need to be interpreted with caution for the case of Thailand is underscored by the relatively high values of the mean square error of the estimates. According to Coale and Trussell (1974), values of the mean square error above 0.01 indicate a rather poor fit between the observed marital fertility values and their model schedules; only values below 0.005 suggest a relatively good fit. The high value of the mean square error undoubtedly reflects, at least in part, sample fluctuations that result from basing age-specific marital fertility rates on relatively small numbers of cases. For example, the worst fits are indicated for the urban marital fertility rates from the particularly small urban samples of SOFT and NS. Although the Surveys of Population Change, which are based on far larger samples, do not directly yield age-specific marital fertility rates, they can be approximated by dividing the reported age-specific fertility rates by the proportions

married (which are provided directly for SPC2, but need to be estimated in the case of SPC1; see footnote 6). The resulting age-specific marital fertility rates from these two surveys fit reasonably well to the Coale-Trussell model, yielding the following values:

	m	M	MSE
SPC1	.12	.92	.001
SPC2	.40	.80	.005

Moreover, it also seems likely that rapid declines in marital fertility will result in dislocations of the age pattern such that they will not conform particularly well to the Coale-Trussell model.

PERCENT PREGNANT AND OPEN INTERVAL

Additional information on recent fertility trends is provided by data on the percent currently pregnant and the mean interval since last birth (see Table 10). In each case, the information on pregnancy status was derived from an independent question separate from the questions on birth histories that served as the basis for calculating the age-specific marital fertility rate. The reported percent pregnant is undoubtedly underestimated, since some women will not recognize an early pregnancy and there might be some hesitancy to admit pregnancy to an interviewer, especially if an abortion is contemplated. Since the extent to which pregnancy status reports are biased may vary from population to population, this measure is not suitable for comparing fertility among different populations (Goldman and Westoff, 1981). Nevertheless, if the bias is relatively constant within the same population, the percent pregnant can be used as an indication of trends in fertility, although it is more problematic as an indicator of fertility differentials. In the case of Thailand, the reported percent pregnant from the series of sample surveys for which this measure is available declines substantially in both rural and urban areas. These results are thus consistent with and help confirm the decline in marital fertility evident in the marital fertility rates calculated from these surveys. Moreover, the results for the CPS1, NS, and AFPH, all of which occurred within the span of a year's time, are quite consistent with each other with the exception of the

TABLE 10 Percent Pregnant at Time of Survey and Mean Number of Months Since Last Birth, Among Currently Married Women Aged 15-44, Standardized for Age, by Place of Residence: Thailand

	LS1 1969/70	LS2 1972/73	SOFT 1975	CPS 1978/79	NS 1979	AFPH 1979	CPS2 1981
Rural							
Percent pregnant	16.2	14.9	12.2	10.0	10.3	9.9[a]	8.5
Open interval	28	34	41	49	51	--	52
Urban							
Percent pregnant	12.2	10.7	9.7	10.2[b]	11.9	8.8[a]	11.9
Open interval	49	50	53	51[b]	52	--	50
Total							
Percent pregnant	15.3	14.3	11.8	10.1[c]	10.4	9.8[a]	9.1
Open interval	31	36	43	49[c]	51	--	51

Note: The age distribution of currently married women in the whole country as reported in the 1970 census was used as the basis of the age standardization.

-- indicates information not available.

[a]Results refer to a universe of 20 provinces; the urban sample refers to provincial urban only.
[b]Bangkok metropolitan area.
[c]Excluding provincial urban.

Sources: Knodel et al. (1980); Kamnuansilpa and Chamratrithirong (1982); and unpublished tabulations.

urban values, which, as indicated above, are based on small numbers of women and refer to differently defined populations. Particularly noteworthy is the fact that the percent of respondents at the national level reporting themselves as pregnant in CPS2, the more recent survey, is lowest of all, suggesting a continuation of the fertility decline in contrast to the slight increase in marital fertility rates reported above.

This measure is less satisfactory for measuring rural-urban differences because urban women, who in general are better educated, may more readily recognize pregnancy at an early stage. The higher percent of urban as compared to rural women reporting themselves as pregnant in CPS2 may reflect such a difference rather than a genuine fertility differential. Nevertheless, it is noteworthy that if the CPS2 results are ignored, the pronounced urban-rural differential in percent pregnant

evident at the time of the earlier surveys contracts considerably over time, probably reflecting the more rapid fertility decline among rural women.

The mean interval since last birth among women aged 15-44 increased substantially in rural areas but changed little in urban areas. As a result, the urban-rural differential has disappeared. Since this measure is derived from the birth histories, it is not independent of the marital fertility rate measures. Nevertheless, these results together with those on the percent pregnant help support the finding that marital fertility has declined substantially in Thailand, and that this decline has been particularly pronounced among rural women.

COMPLETED AND EXPECTED FAMILY SIZE

The high fertility of Thailand's recent past is evident in the cumulative fertility of women currently at the end of their reproductive ages. According to CPS2, the most recent survey, ever-married rural women aged 45-49 reported an average of almost six and one-half children ever born, down only slightly from the seven births per woman reported in the earliest surveys (Kamnuansilpa and Chamratrithirong, 1982; Institute of Population Studies, 1981). Urban women experienced somewhat lower cumulative fertililty by the end of the reproductive span, amounting to about one child fewer than for rural women. Of course, mortality claims some of these births early in life. According to most surveys, the number of living children reported by women in their forties averaged about one less than the number of children ever born. We can expect this difference to decrease in the near future as a result of the recent declines in fertility and in infant and child mortality.

According to the 1960 and 1970 censuses, nearly 60 percent of every married woman aged 45-49 experienced six or more births (see Table 11). The increase in the mean and median children ever born between 1960 and 1970 may reflect in part a decrease in mortality rates, resulting in decreased widowhood among ever-married women. However, differences in the accuracy of the censuses cannot be ruled out as a reason for this increase. Preliminary data from the 1980 census, based on a 1-percent sample, show a considerable change in both the distribution and the mean and median number of children ever born compared to the 1960 and 1970 censuses for women at the end of the

TABLE 11 Percentage Distribution of Ever-Married Women Aged 45-49, by Children Ever Born and Living Children: Thailand

Number of Children	Children Ever Born			Living Children
	Census 1960	Census 1970	Census 1980[a]	Census 1980[a]
0	3.2	1.7	3.0	3.4
1	5.8	5.5	5.3	6.0
2	6.4	6.1	7.1	8.8
3	7.3	7.0	10.4	12.5
4	8.7	8.6	12.5	15.1
5	9.9	9.9	14.3	16.4
6	10.6	10.8	13.1	13.7
7	10.9	11.0	10.8	10.1
8	10.3	10.6	8.5	6.5
9	9.0	9.2	5.9	3.8
10+	17.8	19.7	9.1	3.7
Total Percent	100	100	100	100
Mean	6.29	6.55	5.61[b]	4.91[c]
Median	5.82	6.04	4.82	4.26

Note: Excludes women with unknown numbers of children ever born or living children.

[a]Based on a 1-percent sample tabulation.
[b]Based on assumption that the average number of children ever born to women with 10+ births was 12.0.
[c]Based on assumption that the average number of living children to women with 10+ living children was 11.

Sources: 1980 census from unpublished preliminary tabulations of the 1-percent sample; 1960 and 1970 censuses from official published reports.

reproductive ages. The proportion of women with large numbers of children ever born has decreased substantially while the proportion with three to six children ever born has increased noticeably. There has been little change in the proportion with fewer than three children ever born. This shift in the distribution results in a substantial decline in the mean number of children ever born--by about one birth, compared to the 1970 census results. According to the 1980 results, half of Thai women aged 45-49 had between three and six births over their reproductive life. This downward shift in the distribution of children ever born to women at the end of the reproductive age span indicated by the 1980 census compared to earlier censuses is consistent with the evidence of fertility decline in the intervening period.

We would expect that the impact of reduced fertility at the early stage of a fertility transition would be greatest at the higher parities. However, some caution is called for in interpreting the 1980 census data on the extent of reduced cumulative fertility among women at the end of the childbearing years, because results from several recent surveys (CPS1, NS, and CPS2) do not register the same sharp reduction.

The 1979 NS results (not shown) indicate that about 14 percent of ever-married women aged 45-49 reported ten or more children ever born. This helps confirm the finding that the proportion of women with particularly large numbers of children ever born is declining, although the extent of the decline indicated by the NS is not as dramatic as that suggested by the 1980 census. Part of the reason for this may stem from the more intensive interviewing involved in the NS as well as the fact that detailed pregnancy histories were collected for each respondent, thereby increasing the chance that past births would be reported fully. Likewise, this difference in technique affects all comparisons between census and survey reports on mean number of children ever born. Sampling fluctuations also play a part in such comparisons and, in the case of the NS, part of the contrast with the census may be a result of a biased sample (Institute of Population Studies, 1981).

The preliminary results from the 1980 census also provide information on the distribution of the number of living children among women at the end of their reproductive span. As is the case with results from the sample surveys, the mean number of living children is approximately one less than the mean number of children ever born. Thus, over half of Thai women aged 45-49 report having two to five living children and less than 40 percent report six or more.

During a period of fertility decline, the completed family size of women at the end of their reproductive ages can no longer serve as an approximation of the completed fertility that younger women will eventually achieve by the time they reach the end of their childbearing years. We have attempted to estimate the future completed family size of currently married women still in the midst of their childbearing span by adding the number of additional children each respondent indicated she wanted to the number of living children she already had as of the date of the survey. For convenience, we label this measure the "expected number of children," although

in a strict sense it is based on future fertility desires rather than expectations. Moreover, it is based on living children rather than all live births, since we assume this is a more meaningful measure of family size and that respondents are undoubtedly expressing their future fertility desires in terms of living children rather than simply live births.

In contrast to the minimal change from 1970 to 1980 in the completed family size of women reaching the end of their reproductive ages, the expected number of children shows a substantial decline (see Table 12). Among both the rural and urban sample, the expected number of children calculated for the first round of the Longitudinal Study in 1969/70 is considerably higher at every age than the number indicated by CPS2 in 1981. Generally a consistent trend toward lower expected family size is evident during the intervening period. For Thailand as a whole, the number of children expected by women aged 15-44, after standardization for age, declined by about one child during the period spanned by the surveys. Moreover, it is far below the 5 to 6 living children currrently reported by women who have already reached the end of their childbearing ages.

A clear positive relationship with age is evident for all surveys with respect to the expected number of children. From these figures alone, it is not possible to distinguish the role of differing family size preferences by age cohort from the role of increasing risk of exceeding preferred family size with age, as a result of longer exposure to childbearing; the measure as defined would be sensitive to both. The trend toward lower expected numbers of children among women in the younger age groups, who are less likely to have exceeded their desired fertility, suggests that family size preferences were declining during the period under observation. The decline in expected number of children among women in the older age groups undoubtedly reflects the ongoing decline in marital fertility. The reduction in expected number of children among younger women combined with the increased prevalence of contraception and abortion (see Chapter 5) reflects not only the continuing fertility decline during recent years but also implies a total fertility rate in the future well below current levels unless the expectations are grossly exceeded. Moreover, the rural-urban differences in the expected number of children are rather modest among younger women and are far below the approximately one child difference in the

TABLE 12 Expected Number of Children by Age and Residence for Currently Married Women Aged 15-44: Thailand

Residence and Age Group	LS1 1969/70	LS2 1972/73	SOFT 1975	CPS1 1978/79	NS 1979	AFPH 1979	CPS2 1981
Rural[a]							
15-19	3.27	3.15	2.71	2.34	2.69	2.50	2.39
20-24	3.17	3.16	2.96	2.55	2.90	2.55	2.50
25-29	3.88	3.79	3.34	3.03	3.22	3.08	2.76
30-34	4.34	4.15	4.20	3.70	3.84	3.79	3.40
35-39	5.57	5.58	4.88	4.55	4.59	4.85	4.22
40-44	5.95	4.61	5.46	5.26	5.33	5.27	4.93
15-44							
Unstandardized	4.61	4.06	4.02	3.72	3.96	3.64	3.43
Standardized for age	4.42	3.97	4.00	3.64	3.82	3.74	3.41
Urban[b,c]							
15-19	2.77	2.64	(2.59)	(2.21)	(2.38)	2.00	(1.75)
20-24	2.94	2.88	2.73	2.22	2.59	2.52	2.23
25-29	3.43	3.21	3.21	3.00	2.62	2.88	2.31
30-34	4.14	3.75	3.25	2.98	3.58	3.43	2.77
35-39	4.68	4.47	4.03	3.80	3.81	3.92	3.29
40-44	5.44	5.36	4.66	4.37	4.69	4.78	3.74
15-44							
Unstandardized	4.09	3.87	3.50	3.19	3.52	3.33	2.77
Standardized for age	3.97	3.77	3.45	3.15	3.32	3.34	2.74
Total[a,c]							
15-19	3.21	3.09	2.70	2.32	2.66	2.46	2.31
20-24	3.13	3.12	2.93	2.49	2.85	2.56	2.46
25-29	3.80	3.69	3.32	3.02	3.11	3.06	2.67
30-34	4.30	4.08	4.08	3.57	3.79	3.76	3.28
35-39	5.43	4.56	4.77	4.41	4.44	4.79	4.05
40-44	5.87	4.70	5.36	5.12	5.21	5.22	4.74
15-44							
Unstandardized	4.51	4.03	3.95	3.63	3.88	3.61	3.31
Standardized for age	4.35	3.94	3.93	3.56	3.73	3.71	3.29

Notes: Expected number of children equals the number of living children plus additional children desired. Results in parentheses are based on fewer than 50 cases. The age distribution of currently married women in the whole country as reported in the 1970 census was used as the basis of the age standardization.

[a]AFPH results refer to a universe of 20 provinces.
[b]Bangkok metropolis for CPS and provincial urban from a universe of 20 provinces for AFPH.
[c]Excluding provincial urban for CPS.

Source: CPS2 from Kamnuansilpa and Chamratrithirong (1982).

TABLE 13 Number of Living Children at Time of Study, Additional Number of Children Desired, and Total Expected Number of Children by Age and Residence, for Currently Married Women Aged 15-49: Thailand

Residence and Age Group	LS1 1969/70			NS 1979			Difference (NS-LS1)		
	Living Children to Date	Additional Number Wanted	Total Number Expected[a]	Living Children to Date	Additional Number Wanted	Total Number Expected[a]	Living Children to Date	Additional Number Wanted	Total Number Expected[a]
Rural									
15-19	.61	2.65	3.27	.46	2.24	2.69	-.15	-.41	-.58
20-24	1.44	1.73	3.17	1.17	1.73	2.90	-.27	0	-.27
25-29	2.69	1.20	3.88	2.26	.96	3.22	-.43	-.24	-.66
30-34	3.66	.68	4.34	3.40	.44	3.84	-.26	-.24	-.50
35-39	5.24	.33	5.57	4.26	.33	4.59	-.98	0	-.98
40-44	5.69	.26	5.95	5.22	.12	5.33	-.47	-.14	-.62
45-49	[b]	[b]	[b]	6.05	.09	6.15	[b]	[b]	[b]
Urban									
15-19	.64	2.13	2.77	--	--	--	--	--	--
20-24	1.33	1.61	2.94	(1.27)	(1.32)	(2.59)	(-.06)	(-.29)	(-.35)
25-29	2.33	1.10	3.43	1.83	.78	2.62	-.50	-.32	-.81
30-34	3.47	.66	4.14	2.90	.68	3.58	-.57	+.02	-.56
35-39	4.28	.40	4.68	3.49	.32	3.81	-.79	-.08	-.87
40-44	5.24	.20	5.44	4.49	.20	4.69	-.75	0	-.75
45-49	4.96	.23	5.19	(4.89)	(.18)	(5.08)	-.07	-.05	-.11

Note: Results refer only to women for whom an expected number of children could be calculated. Results based on at least 10 but fewer than 50 cases are shown in parentheses; results based on 10 or fewer cases not shown.

[a]Expected number of children equals the number of living children plus additional children desired prior to rounding to two decimal points.

[b]In the rural round of LS1, women over 45 were not asked about the number of additional children desired.

average number of living children that currently characterizes rural and urban women in their late forties (Institute of Population Studies, 1981; Kamnuansilpa and Chamratrithirong, 1982).

An examination of the separate components of the total number of children expected (living children to date and additional number wanted) for LS1 and NS, two surveys taken a decade apart and based in part on the same respondents, provides some insight into the nature of the changes in expected family size and the validity of this measure as a predictor of future family building (see Table 13). For both rural and urban samples, the achieved number of living children at the time of interview declined for every age group between the two surveys. If measured by children ever born rather than living children, the decline in fertility would be even greater, since decreasing mortality rates in the interim increased the proportion of births that were still living at the time of the NS survey. For all ages except the youngest, most or all of the decline in the total expected number of children is attributable to the decline in achieved family size rather than in reduced numbers of additional children wanted. Nevertheless, it is noteworthy that despite the lower number of living children for women in each age group in 1979, the additional number of children wanted either remained about the same or declined compared to the situation a decade earlier. Thus the reductions in achieved fertility are clearly not the result of postponed births intended to be made up later but reflect instead a demand for fewer children.

Given the ten-year interval between the two surveys (nine years for the urban samples), some indication of how well responses concerning the additional number of children wanted predict subsequent fertility behavior can be found by comparing the total number of children expected for each age group of women in the first survey with the achieved number of living children reported by women ten years older a decade later. One problem in interpreting such a comparison is created by the fact that the information in Table 13 refers only to currently married women. Since the average age at first marriage in Thailand is in the early twenties, married women in the youngest age group, especially in the 15-19 age group who were interviewed for LS1, may not be typical of married women ten years older interviewed in the NS. The latter group would include cohort members who married

during the intervening ten years as well as those who were already married when the cohort was aged 15-19. This problem is less serious for cohorts that were somewhat older at the time of LS1, since most women marry prior to age 25. Despite this problem, a cohort-by-cohort comparison of achieved number of living children in 1979 with the expected number ten years earlier (at the time of LS1) clearly indicates that fertility desires as originally stated were exceeded. For the rural sample this is true for every cohort for which this comparison can be made, with the exception of the women who were 15-19 at the time of LS1. For the urban sample, the achieved number of living children in 1979 was lower than the total number expected in 1970, approximately the same for the cohort aged 20-24 in 1979, and larger for the cohorts that were in older age groups.

Except for the cohort aged 45-49 in 1979 (and thus aged 35-39 ten years earlier), the final family size will undoubtedly be larger than the number of living children reported at the time of the interview in 1979. Thus a closer estimation of the extent to which final family size will exceed the expected family size as indicated in LS1 can be obtained by comparing for each cohort the total number of children expected in 1979 with the expected number indicated a decade earlier. In this comparison, only women who were aged 15-19 at the time of LS1 in both rural and urban samples have lower expected numbers of children in 1979. This is probably a result of the selectivity problem referred to above. The subset of women who marry at particularly young ages among a given cohort are prone to higher completed fertility. Thus the expected number of children to the subset of women aged 25-29 in 1979 whose first marriage occurred at least ten years earlier is higher than both the expected number for all married women aged 25-29 in 1979 and the expected number as calculated for married women aged 15-19 from LS1.[10]

The extent to which the future fertility of any given cohort will exceed the additional number of children wanted is undoubtedly heavily dependent on the prevalence of fertility control practices. Thus we would expect that as contraceptive prevalence and abortion increase, final family size will be closer to the expected number as defined by the present measure. In this connection, it is worth noting that the correspondence on a cohort basis between the total number of children expected as of LS1 for the urban sample agrees more closely with both

the achieved number of living children in 1979 and the total number expected in 1979 than is true for the rural sample, where contraceptive prevalence during most of the period was substantially below that of the urban areas.

In sum, Thailand is currently in the midst of a major decline in fertility. Although it is difficult to date the onset of the fall in fertility with precision, most evidence indicates that the decline started to gain momentum during the 1960s and, for the rural population, probably dates largely from the latter part of the decade. A decomposition of changes in the crude birth rate between the mid-1960s and mid-1970s suggests that neither changes in the age structure nor in the proportion married among women in the reproductive ages contributed in a major way to the declining birth rates. Rather the reduction is largely a matter of a fall in marital fertility. Between the end of the 1960s and the early 1980s, survey evidence indicates that marital fertility fell by almost 40 percent, representing one of the most rapid fertility reductions in the developing world. This reduction in marital fertility is supported by data showing decreases in the percentage of women who are currently pregnant and increases in the average length of the open birth interval.

During the last decade, the decline in fertility appears to have been more pronounced in rural than in urban areas, thus narrowing the formerly substantial rural-urban differential in fertility levels. Regional differences in both the timing and extent of decline are also apparent, although by the early 1980s all areas of Thailand are apparently participating in the ongoing fertility transition. Reductions in the expected number of children during the last decade both reflect the continuing fertility decline and, especially among younger married women, imply a continuation of the recent fertility trends, at least for the near future.

NOTES

[1]The normal expectation would be for the estimates based on the dual-record system approach to be higher than those based on retrospectively reported births from single, cross-sectional surveys. The apparent agreement in the Thai case may be the fortuitous result of compensating errors in the estimates based on the single surveys. It is possible that births are incompletely

reported in the surveys, as would be expected, but that errors in dating the births, either by the respondent or in the process of coding, result in more births being reported as occurring during the year prior to the survey than would be the case if the dating of all reported births were correct. This could then inflate the fertility rates based on births retrospectively reported as occurring in the year prior to the survey so they would agree with levels implied by dual-record system estimates.

One hint that this may be the case is provided by the fact that estimates of fertility from most Thai surveys based on births reported as occurring during the second year prior to the survey are regularly lower than estimates based on births reported as occurring during the first prior 12 months (National Research Council, 1980). This finding is the opposite of what we would expect to be the true case under circumstances of declining fertility. An examination of the procedures used by coders and interviewers to convert reported animal-year dates into Buddhist Era calendar dates suggest that a shift of some births from the second year prior to the survey into the first prior year might have occurred in the process. However, this explanation is at present only an hypothesis and must be examined further before a sound judgment on its validity can be made. A variety of other potential explanations could also account for the agreement, including ones involving errors in the dual-record system estimates.

[2]The measure is similar to the index of marital fertility I_g', proposed by Coale (1969) except that it directly standardizes for age, in the present case using the age distribution of currently married women as reported for the whole country in the 1970 Thai census. For a detailed discussion of I_g', see Knodel (1979).

[3]These rates were calculated from Shevasunt and Hogan (1979:Table 3.1). In that table, rates are given only up through age 44 and thus the 45-49 group is ignored in the calculation of I_g'. The rates for Chiang Mai province and Chieng Rai province were combined using weights of 779 and 1,142, respectively, which refer to the total number of currently married women aged 15-44 that were interviewed. The number of women on which each five-year age group rate is based is not provided in the report.

[4]While age reporting is relatively good in Thailand and most people know their age and year or date of birth, there is substantial evidence of a tendency to state age at next birthday in preference to age at last birthday in response to a direct question about age. Although the precise extent to which this practice occurs has not yet been determined, it seems clear that at any given age, a substantial proportion of respondents state their age at next birthday as opposed to age at last birthday; there is some evidence that the tendency is to round age to that at the nearest birthday (Chamratrithirong et al., 1978). In the 1960 census, age was tabulated on the basis of a direct question on age, while in the 1970 census and other sources age was calculated from the reported date of birth. Thus, age as reported in 1960 tends to be half a year lower on average than would be the case if age at last birthday had actually been reported.

[5]Chamratrithirong (1980:12) has speculated that the SPC2 data underestimates the true proportions single and that the results from SOFT are more accurate because of the way temporarily absent members of the household and temporary visitors were treated.

[6]The necessary data on the age-sex distribution are provided in the reports of SPC1 and SPC2. Data on the proportion of women currently married by age group are also provided directly for SPC2. The proportions currently married at the time of SPC1, however, were not available directly and were estimated by linear interpolation between the 1960 census (after adjustment for a half-year age misstatement) and the 1970 census. Both SPC1 and SPC2 provide age-specific fertility but not age-specific marital fertility; the latter was estimated by dividing the age-specific fertility rates by the proportions married.

[7]Since we had access only to the proportions single by age for 1980, we calculated the proportions currently married by multiplying the proportions ever married in 1980 (the complement of proportions single) by the ratio of currently married to ever-married women as observed in the 1970 census.

[8]The crude birth rate, given the alternative proportions currently married, was calculated by multiplying

the observed age-specific birth rates by the ratio of the alternative proportions currently married to the proportions currently married recorded in SPC2 at each age and then multiplying through by the observed age structure.

[9]Only the date of the most recent birth was asked in CPS1 and CPS2, but this suffices for calculating marital fertility in the year prior to the survey provided we ignore the very small number of next-to-last births that occurred 10 to 12 months prior to interview.

[10]More precisely, the expected number of children born to women who were aged 25-29 at the time of the NS and who indicated their age at first marriage was ten or more years younger than their current age was 3.59 for the rural sample (N = 75) and 2.80 for the urban sample (N = 10).

CHAPTER 3

PROXIMATE DETERMINANTS 1: FAMILY FORMATION AND DISSOLUTION

A clear prerequisite of fertility is "exposure" to sexual intercourse. In most societies, including Thailand, most such exposure occurs within marital unions, although it may also occur to varying extents outside of marriage. In this chapter we focus on the category of proximate fertility determinants that Bongaarts refers to as exposure factors. We start with a discussion of sexual relations and fertility outside of marriage, a topic that has received little previous attention in the demographic literature at least, and then turn to the more familiar topics of marriage, marital dissolution, and remarriage. Finally, we examine evidence on temporary separation of spouses, another topic that has received limited attention but which also plays a part in determining the extent of exposure to sexual relations.

PREMARITAL SEX, PREMARITAL PREGNANCY, AND ILLEGITIMACY

There is relatively little solid data on the extent of premarital sex, premarital pregnancies, and illegitimacy in Thailand. Quite probably the extent and nature of premarital sexual relations and their outcomes differ regionally and between rural and urban areas. Moreover, there is little reason to expect that these matters have remained constant over time.

There are a variety of judgments offered in the anthropological literature with respect to the extent of premarital sexual activity. The conclusions are usually limited to the villages under study, ranging from very little to more common (Kaufman, 1976:149; Potter, 1977:ii; Yoddumnern, 1981; Mougne, 1974, Part III:1; Riley, 1972:115). These differing opinions may reflect

genuine regional and temporal differences or they may stem from different personal biases or abilities at inquiry among the observers. Judging the extent of premarital sexual activity is made more difficult by the lack of a sharp distinction in at least some areas of Thailand between de facto cohabitation and marriage. While some form of ceremony associated with the start of cohabitation is usual, it is not universal (Riley, 1972:117; Yoddumnern, 1981). Since the anthropologists do not provide us with quantitative estimates, perhaps the most that can be said is that there is some premarital sexual activity in rural Thailand but that it is uncertain to what extent it is simply a prelude to more permanent cohabitation by the same couple and thus in a sense part of what might be considered a courtship process leading to marriage.

Prostitution in a variety of forms is an additional source of premarital sexual activity in most urban areas and especially in Bangkok. Patronization of prostitutes is undoubtedly quite common among unmarried (and married) urban Thai males. For example, about one fourth of a sample of Bangkok schcolboys, mostly aged 15-17, and almost two thirds of a sample of unmarried Bangkok male factory workers, mostly aged 18-20, indicated in a survey that they had visited a brothel at least once (Muangnan, 1979:44). The number of unmarried (including separated and divorced) urban women involved in some form of prostitution is also not insignificant (Muangman and Nanta, 1980; Thitsa, 1980) with some unknown and possibly substantial number of illegitimate births resulting. Since the legitimacy status of a birth is not officially recorded at the time of registration, no statistics are available on the proportion of registered births that occur outside of marriage.

Attempts have been made to estimate the extent of premarital births and conceptions by comparing retrospectively reported dates of first marriage and first birth provided in several surveys. For example, according to such calculations based on SOFT, 5 percent of women whose marriage occurred at least five years before the survey were classified as having experienced a first birth prior to their first marriage, and an additional 7 percent were classified as having experienced their first birth within the first seven months of marriage (Institute of Population Studies and National Statistical Bureau, 1977:55). Based on a survey of two northern Thai provinces, Hirschman and Rindfuss (1981)

calculate that 17 percent of ever-married women in the reproductive ages experienced an illegitimate or premaritally conceived first birth. About half of these were born before marriage and the other half conceived before but born after marriage. Data from the Asian Marriage Survey (AMS) indicate that among post-marital first births, approximately 12 percent in the general Bangkok sample, 9 percent in the Bangkok slum sample, and 13 percent in the semi-rural area occurred within eight months of marriage.

Unfortunately, there are sufficiently serious problems with this method of estimating the extent of premaritally born or conceived births that little confidence can be placed in the results. The most serious problem stems from the fact that the validity of such calculations depends on the accuracy with which the dates of first marriage and first birth are reported. In a substantial proportion of cases, respondents cannot recall precisely the month and year of first marriage or, less frequently, of first birth. In such cases, dates are typically imputed prior to actual tabulation. For example, in over 40 percent of the first birth intervals that indicated either a birth prior to first marriage or a birth within the first eight months of marriage from SOFT, imputation of first marriage and/or first birth was required. Of course, some first births treated as post-maritally conceived also involved imputation of dates and might in fact have been premaritally born or conceived. The point, however, is that with such a high proportion of imputation among cases classified as premarital births or conceptions, the validity of the resulting figures is open to serious question.

There may also be deliberate misreporting of dates of first marriage and first birth. Some respondents may attempt to cover up an illegitimate or premaritally conceived birth by adjusting the reported dates accordingly. Others may fail to mention a previous marriage, a sensitive issue for some couples in Thailand, but correctly indicate the date of their first birth when reporting a full pregnancy history. We suspect that many of the negative intervals between marriage and first birth result from such a reporting pattern. Moreover, given the dependency of this approach on a high level of accuracy in dating the event of first marriage and first birth, it is particularly sensitive to errors associated with converting dates reported in terms of animal years and lunar months into more conventional dates, estimates

made by interviewers when the respondent is unable to give precise information, and coding errors. Finally, the fact that typically only married women are included in the surveys on which these calculations are based means that single women who have a birth but do not marry are systematically excluded. Given all these problems, we believe little weight can be placed on calculations of this sort.

Several behavioral and attitudinal indicators of premarital sexual activity in Thailand are available from information collected in the AMS (see Table 14). In response to a question as to how soon after marriage the union was consummated sexually, a small number of respondents explicitly mentioned that they had had sexual relations with their husband prior to marriage. This varied from 5 percent in the semi-rural sample to 15 percent among the Bangkok slum example. We suspect that these figures understate, possibly substantially, the true extent of premarital intercourse among couples who eventually marry, both because the wording of the question implicitly assumed consummation subsequent to marriage and because we expect some respondents would be hesitant to admit having started sexual relations prior to marriage. The significance of the results lies rather in showing that some respondents admit to premarital sexual relations with their husbands when not explicitly questioned about it, thus indicating at least some premarital sexual activity of this sort.

Information about opinions and attitudes concerning premarital sexual experience is also available from AMS. In all three subsamples, the vast majority of respondents believed that men have sexual experience prior to marriage. This is not surprising given the fact that respondents are probably including experience with prostitutes in their assessment. More surprising is the substantial proportion who think that women also have sexual experience prior to marriage, again suggesting the premarital sexual activity other than involvement with prostitution may be relatively common. Approval of sex before marriage, as expressed by female respondents, suggests that a very strong double standard is the norm in Thailand. In all three subsamples, respondents were much more likely to indicate approval of sex before marriage for men than for women. In both cases, the proportion approving is substantially lower than the proportion who think that premarital sexual activity actually occurs.

TABLE 14 Selected Behavioral and Attitudinal Indicators of Premarital Sex as Reported by Ever-Married Women Aged 15-44: Thailand

Indicator	Bangkok General	Bangkok Slum	Semi-Rural
Percent reporting consummation prior to marriage	6.0	14.7	5.1
Percent who think men have sexual experience prior to marriage	95.3	93.9	89.5
Percent who think women have sexual experience prior to marriage	43.1	52.2	47.5
Percent who approve sex before marriage for men	71.5	63.9	52.8
Percent who approve sex before marriage for women	10.1	17.8	10.7
N[a]	514-515	504-507	653-657

[a]Varies slightly from question to question depending on the number of nonrespondents.

Source: Chamratrithirong (1982).

Additional information on attitudes toward premarital intercourse is provided in a study by Muangman (1979) based on a nonrandom sample of adolescent school and factory workers in Bangkok and in a northeastern province. When asked if premarital intercourse was permissible among couples who had no plans for engagement, approval among female respondents was quite low, varying from 3 percent among northeastern factory workers to 14 percent among Bangkok schoolgirls. Approval among male respondents was higher, ranging from 23 percent among northeastern factory workers to 38 percent among Bangkok schoolboys. Approval of premarital intercourse, however, was considerably higher when the situation referred to in the question pertained to couples who planned to get engaged or married or were already engaged. Again, substantial male-female differences persisted. Approval by female respondents of premarital intercourse between engaged couples varied from 18 percent for northeastern factory workers to 37 percent among Bangkok factory workers; for male respondents approval varied from 43 percent of Bangkok factory workers to 63 percent of Bangkok schoolboys.

The results from the study of adolescents and the AMS as well as comments from various anthropologists strongly suggest that premarital sexual activity in Thailand is not unconditionally disapproved, at least by and for substantial proportions of the population. The extent to which this limited tolerance of premarital intercourse

reflects or leads to actual premarital activity is not possible to gauge from available data nor can we estimate the impact on fertility levels. It is a factor that clearly requires more careful and detailed research than currently exists before any final assessment can be reached.

NUPTIALITY

Although there is evidence of some premarital sexual activity and even illegitimacy in Thailand, fertility is predominantly confined to marital unions. Since the onset of marriage (defined as socially recognized cohabitation) marks either the onset of or an increase in exposure to the risk of pregnancy, the age at first marriage, the proportion who ever marry, and patterns of marital dissolution and remarriage all have an important influence on the overall level of fertility.

In Chapter 2, we examined the proportions single at different ages and the singulate mean age at marriage over the last two decades. While not completely consistent, the data appear to point to some increase in the age at marriage but still nearly universal marriage among both men and women. In Thailand the singulate mean age at marriage for women is between 22 and 23 and approximately 40 percent of women aged 20-24 are still single. On a worldwide basis, Thai age at marriage is intermediate between a much earlier pattern characterizing much of the Third World and a later age at marriage characteristic of much of Europe (Chamratrithirong, 1980), although it should be noted that marriage patterns are in a state of flux in many countries.

The relatively low proportion still single by ages 45-49 among women is more typical of less-developed countries than of many Western nations. This has led Chamratrithirong (1980) to speculate that Thailand may be in a state of transition in which not only is the age at marriage slowly rising but the eventual proportion who ever marry is decreasing. He argues that this latter phenomenon is not yet apparent in the statistics because the cohorts currently at the end of the reproductive years are characterized by the former pattern of earlier and more universal marriage. If his interpretation is correct, over the next several decades as the younger cohorts reach the end of the reproductive years, an increase in proportion never marrying should become

evident. In this connection, it is worth noting that in contrast to the 2 or 3 percent of women who were classified as still single at ages 45-49 in all other sources, the preliminary results of the 1-percent sample of the 1980 census show 4.4 percent of that age group as single, higher than any previous figures.

Given the lack of consistency in the evidence examined so far on changing patterns of nuptiality in Thailand, it is useful to examine direct reports on age at first marriage which have been collected in the various sample surveys. One way to do this is to compare the reported age at first marriage of different age groups and hence different cohorts included in each survey. The main problem with these data is that the nuptiality experience of only the oldest cohorts can be considered to be close to complete as not everyone at the younger ages who will eventually marry has done so by the time of the survey. Thus a direct comparison of the mean age at marriage for different cohorts would be biased, since ceteris paribus the mean would be higher the older the age of the cohort at the time of the survey. One way to avoid this bias is to compare the mean age of those who marry before a given age across cohorts who have already reached that age at the time of the survey.[1]

In order to examine whether there has been a trend toward later or earlier marriage, the age at marriage for women marrying before age 25 has been calculated for women aged 25 and above (see Table 15). Had the age at marriage been increasing, the results should show a rise with decreasing age. Several of the surveys point to an increase in the age at first marriage over the recent past among urban women. The results for most of the surveys do not show a clear-cut tendency in this direction for the rural or the total population for which the rural population carries a heavy weight. A similar analysis based on ever-married women in the rural northeast interviewed in NES also revealed little change, with age at marriage under 25 fluctuating only between 19.2 and 19.3 for different five-year age cohorts of women within the reproductive ages.

As Trussell (1980) has pointed out, one drawback of this approach is that the experience of the youngest cohorts, those under age 25, is omitted from the analysis and thus the most recent trends are not revealed. This may explain in part why the increase in age at marriage indicated between the 1970 and 1980 censuses is not confirmed. Of some interest in this connection are the

TABLE 15 Age at First Marriage Among Women Marrying Before Age 25, by Current Age and Residence: Thailand

Residence and Current Age Group	LS1 1969/70	LS2 1972/73	SOFT 1975	NS 1979	AFPH[a] 1979	CPS2 1981
Rural						
25-29	19.4	19.3	19.1	19.5	19.5	19.4
30-34	19.3	19.0	19.1	19.1	19.2	18.9
35-39	19.6	19.3	19.2	19.4	19.3	19.0
40-44	19.1	19.6	18.9	19.2	19.2	19.1
45-49	19.1	19.2	19.2	19.6	--	19.1
50+	19.3	19.2	--	19.1	--	--
Urban						
25-29	20.0	20.1	20.4	20.0	19.9	20.2
30-34	20.0	19.9	20.4	(20.5)	20.0	20.3
35-39	19.6	19.8	20.7	(20.5)	19.5	20.3
40-44	19.4	19.5	19.6	20.0	20.2	19.8
45-49	19.5	19.8	19.9	(19.2)	--	20.2
50+	19.2	19.3	--	19.7	--	--
Total						
25-29	19.5	19.4	19.3	19.6	19.5	19.5
30-34	19.4	19.2	19.2	19.3	19.3	19.1
35-39	19.6	19.4	19.3	19.6	19.3	19.2
40-44	19.1	19.6	19.0	19.4	19.3	19.1
45-49	19.1	19.3	19.3	19.5	--	19.2
50+	19.3	19.2	--	19.2	--	--

Note: Results in parentheses are based on fewer than 50 cases.

-- indicates age groups not included in surveys.

results of the three most recent surveys (NS, AFPH, and CPS2) since they would provide the most recent indication of a trend. In each of these surveys, the age at marriage for the 25-29 age group is older than the age at marriage for the 30-34 age group, perhaps reflecting the shift toward later marriage revealed by the comparison of the 1970 and 1980 censuses. Given the apparent fluctuation in the series for each of these surveys, this evidence can only be considered suggestive.[2] It is also posible for the age at marriage to increase without the change being already reflected in the average age at marriage of persons marrying under 25. For example, if the distribution of ages at marriage under 25 for those who marry under 25 remained unchanged while larger proportions of a

cohort married over 25, the average age at marriage of the entire cohort would increase but the age at marriage under 25 would remain the same. Thus for a variety of reasons, the lack of a clear trend in the age at marriage under 25 cannot be taken as conclusive proof of little change in age at marriage in Thailand.

A somewhat different approach to estimating trends in age at marriage has been taken by Trussell (1980), based on the results of SOFT. By applying the model nuptiality schedules developed by Coale to the reported ages at first marriage of successive age groups of ever-married women as well as to the same data in combination with information on the proportions ever married (tabulated from the household record collected in the survey), he is able to estimate the mean age at first marriage and the proportion who will eventually marry for each cohort. His results are reproduced in Table 16. By applying a model schedule, he is able to extrapolate the full nuptiality experience of each cohort based on their experience up to the date of the survey and thus avoid the downward bias on the mean age at marriage that would result from direct calculations based only on experience to date.

Two slightly different series of mean ages at first marriage were calculated depending on whether the model was applied only to the reported ages at first marriage or to the combination of these data with the proportions

TABLE 16 Estimates of the Mean Age at Marriage and Proportions Eventually Marrying for Women, Based on Fitting the Coale Model Marriage Schedule to Individual Data on Age at Marriage Alone, and Combined with Data on Proportions Ever Married from the Household Schedule of SOFT: Thailand

Cohort	Estimated Mean Age at First Marriage		Estimated Proportions Eventually Marrying (from combined data)
	Individual Data	Combined Data	
20-24	21.2	21.4	.900
25-29	21.1	21.2	.921
30-34	20.8	20.8	.929
35-39	20.7	20.7	.945
40-44	20.2	20.2	.963
45-49	20.3	20.3	.967

Source: Adapted from Trussell (1980).

ever married derived from the household schedule. Both series suggest that a modest increase in the age at first marriage has been underway over recent decades. In addition, Trussell's estimates of the proportion that will eventually marry suggest that a movement away from virtually universal marriage is also taking place. These results, of course, are only estimates and depend both on how well the model nuptiality schedule fits actual Thai experience and on the accuracy of the data used in the calculations. A decrease in the proportion eventually marrying to only 90 percent, as indicated by Trussell's estimates, implies a rather radical change in this aspect of the Thai nuptiality pattern and probably should be taken only as suggestive of the direction in which the change is occurring rather than an indication of the actual magnitude to be expected.

It is worth noting that Trussell's estimates of the mean age at first marriage even for the more recent cohorts are lower than any of the singulate mean ages at first marriage calculated from the proportions single as reported in the various censuses and surveys included in Table 8. Part of the reason for this discrepancy derives from the fact that when calculations of the singulate mean age at first marriage are based on a single cross-section from a census or survey, they incorporate an assumption of unchanging marriage patterns over the recent past. Since the evidence seems to point to increases in the age at marriage and in proportions single, particularly at younger ages, over the last two decades, this assumption is not met. As a result, estimates of the singulate mean age at marriage that are based on single cross-sections tend to be biased upward. Agarwala (1962) has proposed a method of calculating the singulate mean age at marriage that avoids the assumption of unchanging nuptiality, provided data are available for two points in time.[3] The resulting calculations reflects the age at marriage implied by the nuptiality experience during the period intervening between the two sets of observations and is no longer biased by changes that may have occurred prior to the first observation. Calculations based on the proportions single in the last three censuses (using a half-year adjustment for the 1960 census) yield a singulate mean age at marriage of 21.60 for the 1960-70 intercensal period and 21.99 for the 1970-80 intercensal period. As expected, these estimates of the singulate mean age at marriage are lower than would be obtained if we simply averaged the estimates derived from each census

separately. Nevertheless, the estimates are still somewhat higher than those provided by Trussell even for the most recent cohort, suggesting some deviation between the marital experience as recorded in the actual data and that reflected in the model nuptiality schedules.

Substantial differences in nuptiality patterns exist between rural and urban residents in Thailand. As indicated in Table 17, the percentage single as recorded in the 1970 census is higher at every age among urban residents than among their rural counterparts. This holds equally for men and women. The singulate mean age at marriage is approximately three years higher for both men and women living in urban areas than for rural residents of the same sex. The largest absolute rural-urban differences are in the age group in the twenties and thus for the ages at which fertility is potentially highest. Some difference still persists even at the end of the reproductive ages, although the percentage remaining single is low enough to suggest nearly universal marriage even in urban areas. Analysis based on the first round of the Longitudinal Study as well as the 1970

TABLE 17 Percentage Single by Age, Sex, and Residence, and Singulate Mean Age at Marriage (SMAM) by Sex and Residence, 1970: Thailand

	Percentage Single			
	Urban Areas		Rural Areas	
Age Group	Male	Female	Male	Female
10-14	100.0	99.7	100.0	99.5
15-19	98.1	89.2	95.8	79.5
20-24	80.8	59.2	60.4	33.7
25-29	43.8	30.8	20.4	12.8
30-34	20.2	16.3	8.1	6.7
35-39	10.3	10.1	4.4	4.5
40-44	6.1	7.1	2.7	3.4
45-49	4.8	5.5	2.0	2.7
50-54	3.9	4.2	1.6	2.3
Total standardized by age	58.0	51.9	50.2	42.8
SMAM	27.2	24.7	24.2	21.4

Source: Adapted from Chamratrithirong (1980).

census suggests that among urban residents differences exist between those living in Bangkok and those living in provincial urban areas, with the proportion single at any given age and the age at marriage being higher among Bangkok residents (Prachuabmoh et al., 1972; Chamratrithirong, 1980). Similar differences in the marriage patterns of the rural, provincial urban, and Bangkok populations are also evident from the special 1-percent tabulations of the 1960 census (Goldstein et al. 1973).

Regardless of which set of estimates are accepted as the most representative for Thailand, the age at marriage, especially for women is somewhat older than in many other less-developed countries. The probable recent rise in the age at marriage most likely reflects the same modernizing forces that apparently are changing nuptiality in other Asian countries (Smith, 1980). A cross-sectional analysis of 1970 census data by Chamratrithirong (1980) supports the sugggestion that socioeconomic change affected nuptiality in Thailand during the previous decade. In a cross-provincial analysis, both age at marriage and percentage single were positively related to socioeconomic characteristics, especially for men.

Even before the recent changes in nuptiality patterns, female age at marriage in Thailand appeared traditionally to have been moderately late by Third World standards. Lauro (1979) suggests that the prevalence of bride-price payments and the custom of male entrance into monkhood prior to marriage have acted as important factors contributing to delayed marriage. These factors would appear to be more relevant for explaining the male rather than the female age at marriage. If there is also a norm in favor of a narrow age gap between spouses, however, women's age at marriage would also be affected. Lauro also notes that residents of the village he studied frequently expressed a feeling that couples should not marry until they were old enough to shoulder the responsibilities of raising a family. Although temporary residence with the bride's parents is fairly common following marriage and may ease the financial burden faced by a newly married couple (Yoddumnern, 1981), this typically lasts only for a short period after which neo-local residence is established (Henderson, 1971; Limanonda, 1979). Support of the newlywed couple's children generally falls on the couple themselves rather than being absorbed by a composite household economy, as may be common in countries where age at marriage is quite

early (Davis, 1955). This relative economic and even social independence of newly formed families may well be a crucial factor in accounting for the relatively later age at marriage, as it is hypothesized to have been historically in Western Europe, although to an even more extreme extent.

The strong association between age at first marriage and completed fertility is evident in Table 18, which compares the mean number of children ever born by age at first marriage for ever-married women close to or past the end of the reproductive span as recorded by LS1 and NS, the two surveys spanning the decade of the 1970s. Almost without exception, the mean number of children ever born declined with increased age at first marriage. A useful summary measure of the bivariate association between age at first marriage and children ever born is provided by the slope of the least squares regression line.

Under conditions of natural fertility, the influence of age at first marriage on completed fertility presumably operates primarily through increasing the amount of time during the reproductive span that a woman is exposed to the risk of pregnancy. Under conditions of widespread fertility control within marriage, this link might be expected to be weakened as increased exposure time could be counteracted by earlier practice of contraception. However, as others have pointed out, even under conditions of widspread fertility control, there are a variety of mechanisms that can link these two variables (van de Walle, 1973; Bumpass and Mburugu, 1977). For example, as long as there is some contraceptive failure, the link between longer exposure and higher cumulative fertility should persist even if to a lesser extent. Younger marriages may also be associated with high fecundity, higher fertility desires, or socioeconomic characteristics associated with less efficient contraceptive practice. Thus while increased birth control within marriage could potentially lead to a weakening of the inverse association between age at marriage and completed family size, other outcomes are possible.

The results in Table 18 are mixed in this respect. At the time of LS1, only a small proportion of ever-married women aged 40-49 and almost none of those 50 and over indicated they had ever practiced contraception. During the decade of the 1970s, as documented in Chapter 5, contraceptive prevalence increased dramatically, and by 1979, the year NS was fielded, a substantial proportion

TABLE 18 Mean Number of Children Ever Born to Ever-Married Women Aged 40 and Over by Current Age and Age at First Marriage: Thailand

	Rural Women				Urban Women			
	40-49		50 and Over		40-49		50 and Over	
Age at First Marriage	LS1 1969	NS 1979	LS1 1969	NS 1979	LS1 1970	NS 1979	LS1 1970	NS 1979
Under 19	7.50	7.42	7.37	7.16	6.53	(5.96)	5.86	(6.73)
19-21	6.87	6.60	6.95	6.53	6.16	(4.77)	6.20	(6.00)
22-24	6.26	5.83	(6.91)	6.51	5.09	(4.85)	(4.61)	(5.46)
25-29	(4.97)	4.05	(5.04)	(6.11)	3.89	(4.20)	(4.02)	(5.08)
30-39	(3.50)	(2.14)	(3.92)	--	(2.74)	--	(2.17)	--
Regression Slope (b)[a]	-.24	-.35	-.21	-.14	-.27	-.17	-.23	-.24

Notes: A small number of women reporting an age at first marriage of 40 or over are excluded. Results based on 10 or more cases but fewer than 50 are shown in parentheses; results based on fewer than 10 cases not shown.

[a]Based on data for age at first marriage expressed in single years of age. All slopes are statistically significant at the .001 level.

of women at the end of their reproductive span, especially those aged 40-49, had practiced contraception at some time. Nevertheless, the relationship between age at first marriage and children ever born actually strengthened among rural women 40-49, according to a comparison of the regression slopes indicated for these women in LS1 and NS. Although the regression slope decreased for women aged 50 and above, for these women the change in contraceptive practice was probably less dramatic than for their younger counterparts. It is also interesting to note that for both LS1 and NS, the regression slopes indicate a stronger correlation for women aged 40-49 than for women 50 and over, despite the fact that undoubtedly higher proportions of women 40-49 practiced contraception than the older women at the time of each of the surveys. Results for the urban women are also mixed in this regard. Among women 40-49, the correlation indicated by the regression slope is weaker in 1979 than in 1970 and is virtually unchanged for women 50 and over. Since Thailand is still in a state of transition with regard to the spread of birth control, the relationship between age at first marriage and cumulative fertility may indeed weaken in the future, but so far the evidence does not point clearly in this direction.

MARITAL DISSOLUTION AND REMARRIAGE

Anthropologists typically have noted that divorce and remarriage are common in Thailand (Henderson, 1971:70). Divorces are even less frequently officially registered than are marriages. Instead, marital dissolution is typically the product of an informal process whereby one of the partners simply moves out. Information on marital histories has been collected in a number of demographic sample surveys. Apparently, this is a sensitive area of inquiry for at least some respondents, and interviewers have often reported that they have encountered respondents who seem reluctant to discuss their marital histories in detail. Thus there is probably a tendency to underestimate the extent of marital dissolution and remarriage based on such information. Nevertheless, as shown in Table 19, a substantial proportion of ever-married women report being married more than once when questioned about their marital histories. In each of the four surveys for which such data are available, the percentage married more than once is higher among rural women than among

TABLE 19 Percent Married More than Once by Age and Residence, Ever-Married Women: Thailand

	Rural				Urban				Total			
Current Age	LS1 1969	LS2 1972	SOFT 1975	NS 1979	LS1 1970	LS2 1973	SOFT 1975	NS 1979	LS1 1969/70	LS2 1972/73	SOFT 1975	NS 1979
15-24	4.8	3.1	5.4	2.9	2.1	1.7	5.6	0	4.4	2.9	5.5	3.2
25-34	10.1	9.0	10.2	5.1	4.8	4.3	4.6	2.4	7.6	8.2	9.4	4.6
35-44	12.3	11.8	19.2	10.9	7.6	5.6	5.5	3.6	11.5	10.8	17.3	9.5
45+[a]	20.0	22.3	17.4	13.4	9.2	6.8	8.2	6.8	18.2	20.2	16.0	12.3

[a]Limited almost entirely to women aged 45-49 for SOFT.

urban women. Indeed, perhaps as many as one in five among rural women remarry at least once by the end of the reproductive age span. Data from the first round of the Longitudinal Study indicate that among urban women, remarriage is indicated more commonly by those living in provincial urban centers than by those in the capital, although the extent of the difference is less marked than between rural and urban categories overall (Prachuabmoh et al., 1972).

David Smith (1981) applied life table techniques to data from SOFT in order to estimate probabilities of marriage dissolution and remarriage. Because he found a much higher probability of divorce and separation among women who marry at particularly young ages and because such a high proportion of married women under age 25 at the time of interview were concentrated among women who marry at early ages, much of his analysis is limited to women aged 25-29. Table 20, which summarizes his results on marriage dissolutions, indicates that almost one out of five Thai women can expect dissolution within the first 15 years of marriage and close to one out of four within the first 20 years. During the early years of marriage, divorce and separation are far more important sources of marital disruption than widowhood, and even by the end of 20 years they together account for over 60 percent of total dissolution.

While marital disruption is frequent in Thailand, so is remarriage, particularly for women who are at the younger reproductive ages at the time of dissolution. As

TABLE 20 Cumulative Proportions of First Marriages Dissolved as Estimated by Life Table Analysis, by Source of Dissolution and Duration of Union, Ever-Married Women Aged 25-49, 1975: Thailand

Duration of Union	Total Proportion Dissolved	Source of Dissolution	
		Widowhood	Separation or Divorce
2.5 years	.035	.002	.033
5 years	.094	.014	.081
10 years	.145	.037	.113
15 years	.190	.064	.135
20 years	.233	.090	.143

Source: Adapted from Smith (1981:Tables 3 and 4 [based on SOFT]).

is evident in Table 21, which summarizes Smith's life table analysis of the probability of remarriage, almost two thirds of women in the reproductive ages remarry within five years of marital disruption. Among women under age 25 at the time their first marriage ends, almost one third remarry within a year, well over half have remarried by two and one-half years, and almost four fifths by five years. Even among women aged 25-34 at the time of dissolution, half have remarried within five years. Only older women are likely to remain unmarried in large proportions. Hence high remarriage rates appear to counteract much of the potential loss of exposure to pregnancy risk that could result from the substantial rates of marital dissolution.

When a marriage is dissolved prior to the end of a woman's childbearing age span, it reduces exposure to childbearing to the extent a woman remains celibate during the period she is unmarried. In cases where the woman remarries, this reduced exposure is a result of the time spent between unions, while for women who do not remarry reduced exposure will extend from the time of the marital dissolution to the end of her reproductive span. Thus while age at first marriage affects the extent of reduced exposure to childbearing at the beginning of the reproductive span, marital dissolution influences exposure during the middle and later segments of this

TABLE 21 Cumulative Proportions of Women Remarrying Following Dissolution of First Marriage as Estimated by Life Table Analysis, by Age at Dissolution and Duration Since Dissolution, Ever-Married Women Aged 25-49, 1975: Thailand

Years Since Dissolution	Total	Age at Dissolution		
		Under 25	25-34	35+
1 year	.247	.327	.191	.085
2.5 years	.453	.587	.344	.186
5 years	.647	.796	.511	a

[a]Not given in source because sample size was under 50 cases.

Source: Adapted from Smith (1981:Table 8 [based on SOFT]).

span. Davis and Blake (1956) specified "the amount of reproductive period spent after or between unions" as one of their intermediate variables. The relationship of marital stability to fertility is complex, especially under conditions where deliberate fertility control is widespread (Thornton, 1978). For example, in cases where marital dissolution occurs due to marital discord, exposure may also be influenced by reduced coital frequency or abstinence during some period prior to the marriage break-up. Likewise, selection processes may complicate the observed relationship. For example, subfecundity or childlessness may encourage divorce or inhibit remarriage. Following marital disruption or remarriage, a woman's family size preferences may change. Thus the impact on exposure to pregnancy risks is but one of the several mechanisms that can potentially link marital disruption and fertility.

Based on the data coded from the marriage histories in LS2 and SOFT, it is possible to estimate the time spent between or following unions among ever-married women in the reproductive ages (see Table 22). As would be expected, the older the age group of women, the longer the average amount of time spent between or following unions. Although there is some disagreement in the results between the two surveys, especially for women toward the end of the reproductive span, both sets of

TABLE 22 Estimated Time in Years Spent Between or Following Unions Among Ever-Married Women Aged 15-49, by Age and Residence: Thailand

	Rural		Urban		Total	
Age Group	LS2 1972	SOFT 1975	LS2 1973	SOFT 1975	LS2 1972/73	SOFT 1975
15-19	.06	.10	.00	(.07)	.06	.10
20-24	.22	.18	.07	.16	.17	.18
25-29	.39	.31	.13	.15	.34	.28
30-34	.51	.55	.24	.26	.46	.51
35-39	.56	1.07	.51	.40	.55	.98
40-44	.60	1.10	1.14	1.43	.67	1.15
45-49	1.39	1.99	1.30	2.34	1.37	2.05

Notes: Results for LS2 exclude women with incomplete information in their marital histories; results from SOFT are based on the World Fertility Survey standard recode tape and thus include imputed information for women with incomplete marriage histories. Results in parentheses are based on fewer than 50 cases.

estimates suggest that the amount of exposure time to childbearing lost as a result of marital dissolution is not very large during the prime reproductive years and hence is unlikely to have a significant impact on fertility. It is only by the end of the reproductive span that the average amount of exposure time lost exceeds a year. The largest increments are generally evident between the last two age groups, suggesting that much of the exposure time lost for the 45 to 49-year-old women probably occurred toward the end of the childbearing years when their fertility rates would be low in any event.

The results indicate that the amount of time spent between or following unions is higher for rural women than for urban women at ages below 40. The reversal in this differential for women in their forties (except for women 45-49 in LS2) does not necessarily contradict the findings in Table 19, which consistently showed higher proportions married more than once among rural than urban women at all ages, since the time spent between or following unions depends on the particular combination of the extent of marital dissolution, the extent of remarriage, and the interval between dissolution and remarriage. Thus it is possible that marital dissolution is lower in urban areas but if remarriage is also lower or delayed longer, reduced exposure time could be higher. A more detailed analysis would be required before conclusions could be reached about the source of rural-urban differences in marital dissolution and the resulting reduced exposure time.

Based on his analysis of data from SOFT, Smith (1981:25) estimates that separation and divorce (holding widowhood constant) are responsible for a loss of only four and one-half months of marriage per capita during the 15 years between the prime fertility ages of 20 and 35. This amounts to only 3 percent of the time currently spent in marriage and thus is unlikely to have more than a marginal influence on fertility. Such an estimate, based only on loss of presumed exposure time, ignores possible complexities as referred to above in the relationship of marital stability to fertility, but is a useful starting point for assessing the extent of relationship.

The marital status structure of women in the reproductive years at any given point in time reflects the net impact of entry into marital unions, marital dissolution, and remarriage on the amount of time spent within marital

unions. Given the strong association between age and fecundity within the childbearing span, the implications of different marital structure distributions for fertility depend not only on the overall proportion in a given marital status, but also the age profile of women in different marital status categories. Coale (1969) has proposed an index of the proportion currently married among the reproductive ages that is weighted according to the age profile of natural fertility as represented by the age-specific marital fertility of the Hutterites. This idea has been extended to indexes of other marital statuses (Smith, 1978). The main advantages of these indexes are that they reflect not only the marriage pattern of women, but also the potential effect of their marital status on fertility. Thus, for example, the same proportion of women divorced toward the end of the reproductive span carries less weight than at earlier ages, when fecundity is presumed to be higher.

Table 23 shows a complete set of these marital status indexes for Thai women based on the 1970 census. Since the sum of the indexes is one, it is possible to determine the extent of reproductive potential (i.e., under conditions of natural fertility as embodied in the Hutterite marital fertility schedule) that is realized through marriage or lost through women being in various unmarried states (under the assumption that illegitimacy is negligible). Thus the results suggest that approximately 6 percent (I_m = 0.646) of the reproductive potential of Thai women in 1970 was realized through the existing marriage pattern. Of the 35 percent of potential unrealized, fully 30 percent (I_s = 0.302) was unrealized because of delayed or foregone entry into first marriage

TABLE 23 Marital Status Indexes for Women, by Residence, 1970: Thailand

Region and Area	Proportion Married I_m	Proportion Single I_s	Proportion Divorced I_d	Proportion Separated I_p	Proportion Widowed I_w
Whole Kingdom	.646	.302	.011	.020	.021
Urban	.523	.452	.009	.001	.015
Rural	.669	.278	.011	.019	.022

Source: Adapted from Chamratrithirong (1980).

and only 5 percent of potential fertility (the sum of $I_d + I_p + I_w$) was unrealized because of marital dissolution.

Thus, although marital dissolution is relatively common in Thailand, its impact on potential reproduction is not very large because much marital dissolution occurs at ages where fecundity is considerably past its peak. Among the three forms of marital dissolution, divorce and separation together have greater effect on fertility than widowhood. The impact of all three forms of marital dissolution on potential reproduction is greater in rural areas than in urban areas. Nevertheless, a substantially higher proportion of reproductive potential is realized through marriage among rural women than among urban women, as indicated by the substantially higher rural values on the I_m index. Thus the greater marital dissolution in rural areas is far more than compensated for by their earlier and somewhat more universal marriage pattern.

Several studies have examined the influence of marital dissolution on actual fertility in Thailand by determining differences in cumulative fertility by marital status. Goldstein et al. (1973) based their study on a special 1-percent sample of the 1960 census; Knodel and Prachuabmoh (1974) utilized data from the first round of the Longitudinal Study; Chamratrithirong (1980) analyzed the 2-percent sample of the 1970 census; and Smith (1981) examined data from SOFT. All studies show that at virtually all ages currently married women report higher mean numbers of children ever born than women previously but not currently married. Each study (except Smith's, which does not examine the issue) also finds that the cumulative fertility of widows exceeds that of divorced and separated women. For example, the 1960 census results indicate that at the national level, the age-standardized mean number of children ever born to widows is 78 percent as high as for currently married women, while for divorced and separated women combined it is only 57 percent as high.[4] Similarly, the 1970 census results indicate that nationally the age-standardized mean number of children ever born to widows is 80 percent as high as for currently married women; for separated women it is 67 percent as high; and for divorced women, 53 percent as high. Moreover, Knodel and Prachuabmoh, based on LS1, and Smith, based on SOFT, find that after controlling for age at first marriage, currently married women in their first marriage experienced higher cumulative fertility than remarried women.

As Smith (1981:27) points out, the difference in mean number of children ever born to ever-married women versus women in first marriages at the end of the reproductive ages can be taken as a crude estimate of the overall fertility cost of marital dissolutions. In his study, this difference amounts to 0.3 children for women aged 40-49. However, this may underestimate the impact, as it does not allow for the older age at first marriage of those still in their first marriage by the end of the childbearing ages. Based on data from LS1 and presented by Knodel and Prachuabmoh (1974:Table 7), we compared the mean number of children ever born to all ever-married women aged 45 and older with the mean for currently married women still in their first marriage, standardizing for age at first marriage for all ever-married women. The result was a difference of about half a birth. About 40 percent of ever-married women 45 and above in the LS1 sample were not currently in their first marriage. Thus if all ever-married women 45 and over experienced the same complicated fertility as those still in their first marriage, completed family size would have been about 0.2 children higher (0.4 x 0.5 = 0.2) or about 3 percent more than observed. Hence on the micro-level, marital dissolution and disruption do influence cumulative fertility, but the overall impact on marital fertility levels is not great.

TEMPORARY SEPARATION OF SPOUSES

In addition to the permanent dissolution of a marriage, temporary separation of spouses acts as a source of involuntary abstinence, thus reducing exposure to intercourse and thereby influencing fertility levels. In particular, Davis and Blake (1956) cite the separation of couples due to migration as examples of such a situation. While available evidence for Thailand does not permit a definitive judgment on the extent to which temporary separation of spouses exists, there are several indications that temporary separations are not infrequent. In the officially published census reports, currently married persons with spouses present are not distinguished from those with spouses absent, although persons who are separated (presumably on a permanent basis) are distinguished from currently married persons.

However, special tabulations based on the 1-percent sample of the 1960 census and analyzed by Goldstein et

al. (1973) do subdivide the currently married population into those with spouse present and those with spouse absent. As Goldstein et al. point out, the category "married with spouse absent" undoubtedly includes a variety of situations. In some cases, permanent separation may have occurred but appropriate legal recognition is lacking or one of the spouses is reluctant to admit to the actual situation. Most of this category, however, may be attributable to more genuine situations of temporary separation created by the movement of one partner while the other has remained behind, either waiting for the absent spouse to return or to join the absent spouse at a later date. In addition, there may be other situations in which the spouses are living apart because their employment demands it, particularly in Bangkok, where the wife may be employed as a domestic servant. Finally, some women in this category may be minor wives who share their husband with other wives at different residences. Although not legally sanctioned, polygyny is known to exist in Thailand and is more or less socially acceptable (Riley, 1972:116; Henderson, 1971:70). In general, observers note that polygyny is rare in rural villages but may be more common in urban areas (Blanchard, 1958:435). Frequently, polygyny involves separate residences for the multiple wives. The fact that approximately 50 percent more women reported themselves as married with spouse absent compared to men might be attributable to the institution of minor wives, since otherwise these numbers should be equal (Goldstein et al., 1973).

Based on tabulations of the special 1-percent sample of the 1960 census, it is possible to calculate the percent of currently married women who report their husbands absent (see Table 24, Panel A). For the total sample, approximately 3 percent of currently married women under age 50 indicated their husband was absent, but this figure masks substantial rural-urban differences. As many as one in five women in Bangkok (after age-standardization) reported an absent husband, reflecting perhaps a greater prevalence of minor wives and higher urban rates of employment of married women as domestics, as suggested above.

To assess the extent to which reproductive potential is reduced through temporary separation of spouses, the same approach used to calculate the marital status indexes presented in Table 23 can be applied to the data on currently married women with absent husbands. The results

TABLE 24 Indicators of Temporary Separation of Spouses: Thailand

Part A. Percent of currently married women, aged 13-49, reporting husband absent, by age and residence, 1960

Age Group	Bangkok	Other Urban	Rural	Total
13-19	50.0	24.5	8.6	10.4
20-24	33.6	13.0	3.6	5.2
25-29	21.7	7.4	2.1	3.4
30-34	17.1	6.0	1.3	2.2
34-39	11.0	3.6	1.4	1.9
40-44	10.1	4.2	1.4	2.0
45-49	15.3	7.7	1.4	2.5
Age standardized total[a]	20.4	7.9	2.2	3.3

Part B. Percent of currently married usual residents of households listed as temporarily absent, by age, sex, and residence, April-May 1979

	Rural		Urban	
Age Group	Husbands	Wives	Husbands	Wives
Under 30	8.3	3.5	4.3	3.4
30-49	2.5	0.9	3.2	1.2
50+	1.4	1.2	0.7	1.0
Total[b]	3.3	1.7	2.6	1.7

Part C. Percent of married residents who were absent at least once during 1976-79, by age and sex, six villages in northeast Thailand

	Husbands		Wives	
Age Group	Percent Absent	N	Percent Absent	N
Under 30	44.1	102	21.4	140
30-49	27.7	213	2.9	208
50+	4.5	112	1.2	84
Total	25.5	427	8.6	432

Note: Results in Part A based on a 1-percent sample of the 1960 census but exclude the province of Thonburi.

[a]The age distribution of currently married women in the total sample was used as the basis for age standarization.
[b]Includes a small number coded as age unknown.

Sources: Part A: Calculated from Goldstein et al. (1973:Table 2).
Part B: NS.
Part C: Calculated from Lightfoot and Fuller (1981:Table 5).

indicate that for the total sample from the 1960 census, the reproductive potential of all Thai women was reduced by only 0.2 percent, although for the Bangkok sample this figure rises to 2.7 percent, reflecting the much higher prevalence of absent husbands in the capital. Goldstein et al. (1973) have shown that cumulative fertility at virtually all ages is substantially lower for women whose husbands were absent than for those with husbands present. For example, the age-standardized number of children ever born in 1960 was about one fourth lower if the husband was absent.

Another source of information about the extent of temporary separation between spouses is the data collected on individual members of households as part of sample surveys. In the NS, information was recorded on the household schedule for all usual residents of each sample household with an indication of whether they were present or temporarily absent, with definitions of "usual resident" and "temporarily absent" apparently left up to the respondent. One possible problem with this type of information is that absent spouses may not be reported as usual members of the household, especially if they have been gone for a relatively long time.

The percentages of currently married men and women who were reported as temporarily absent are compared in Table 24, Panel B. Absences were more common for currently married males than for females in almost all age groups and for both the rural and urban portions of the sample. Unfortunately, from the existing tabulations it is not possible to know how many of the absent married women were married to the married men listed as absent. Undoubtedly some of the husbands and wives listed as absent from the household were spouses. Thus the proportion of husbands who were absent should represent a maximum estimate of the proportion of women who were separated from their spouses while the difference between the proportions of husbands and wives absent would represent a minimum estimate (since not all the wives who were absent were necessarily spouses of the married men who were absent). Thus for the rural sample, somewhere between 1.6 and 3.3 percent of currently married women in the household were temporarily separated from their husbands, while for the urban sample, somewhere between 0.9 and 2.6 percent were in that situation. Of course, if many absent spouses were not included as usual residents in the household by the respondents, even the maximum estimate may actually underestimate the extent of temporary separation.

The figures provided in Panel B suggest that there might be greater separation of spouses in rural than in urban areas, contrary to the results presented in Panel A. The approaches, however, are quite different and are by no means directly comparable. The results in Panel B refer only to spouses who are considered permanent residents of the household interviewed. If either a married woman or her husband or both are not considered to be usual residents of the household, their temporary separation would not be reflected. For example, if a woman is employed as a domestic servant and is separated from her husband, she would not report her husband as a usual resident of the household in which she is working or may indeed not be reported herself as a usual resident of that household, and thus their separation would not be reflected in the results in Panel B. For this reason, the actual proportion of women who have absent husbands in the overall population, and particularly the urban population, may be considerably higher than indicated through this approach.

Probably the single most important source of absences among rural spouses is circular migration, typically associated with temporary employment in some other location, often in an urban area. One recent study of circular migration in six villages in northeast Thailand by Lightfoot and Fuller (1981) provides additional information relevant to assessing the extent of temporary separation of spouses. Their study indicates that there is an important although not overwhelming seasonal component to circular migration, with the highest rates of absence occurring after the rice harvest and prior to the following planting season, although they point out that the temporal pattern of the migration is quite complex and not strictly related to the farming calendar. In this connection, it is worth noting that both the 1960 census and NS, the sources on which Panels A and B of Table 24 are based, took place during that part of the year when temporary absences would be expected to be highest.

While much temporary migration is among single persons and thus not relevant to the separation of spouses, data presented by Lightfoot and Fuller permit calculation of the percentage of married residents who were absent at least once during the three-year period under study. By comparing the results for men and women, some idea of the extent to which spouses were separated can be gained. As indicated in Panel C of Table 24, a far higher percentage

of married men have been absent during the three-year period than married women, thus suggesting at least some period of temporary separation. Rates of absences are inversely related to age, with far fewer absences indicated for men and women at age 50 and over. The data presented in their paper do not permit direct linking of husbands and wives, so we do not know what proportion of women in reproductive ages were married to men aged 50 or above who show the lower rates of absences. Judging from the fact that the difference between ages of spouses is typically not large in Thailand, it seems safe to assume that the vast majority of wives under 50 were married to husbands who were also under 50 and thus that the proportion of reproductive-age married women whose husbands were away at least once during the three-year period is quite substantial. Note should be taken, however, that respondents were classified according to marital status at the time of the survey and thus for those persons who married within the three-year reference period, some of the absences may have occurred while they were still single. Also, absences were liberally defined as any overnight absence, thereby maximizing the proportion who were absent at least once. Data on duration of absence indicate that many absences involved considerably longer stays than a single night. For example, 57 percent of all absences were a result of trips to Bangkok, and almost 70 percent of these visits lasted at least a month, with approximately 40 percent lasting more than three months at any one stretch. Moreover, a number of persons experienced more than one absence during the three-year period. Finally, it should be noted that the six villages under study were in a province characterized by unusually high migration rates.

In brief, the assorted information about temporary separation of spouses was sufficient to suggest that this factor may play a nonnegligible role in influencing Thai fertility levels, although it is not likely to be a dominant factor except perhaps under some special local circumstances.

NOTES

[1]While such a comparison eliminates the bias mentioned, it does not eliminate problems that could arise from differential reporting accuracy by age. Older married women would be recalling their age at an event

further in the past than younger married women and thus may be more prone to recall error, including digit preference. Although an association between age and extent of recall error does not automatically bias results, it potentially could. Other problems with this approach are discussed in Trussell (1980:12).

[2]According to a difference of means test (based on a simple random sample assumption), the differences between these two cohorts in NS and AFPH are not significant at the .05 level, while results for CPS2 are significant at the .001 level.

[3]The technique for calculating the singulate mean age at marriage based on the two censuses is also described in Chamratrithirong (1976) and United Nations (1982).

[4]For the purpose of this comparison, we calculated the age-standardized number of children ever born for all currently married women from figures given for currently married women with spouse present and with spouse absent separately in Goldstein et al. (1973). We simply weighted the results for each of the two categories in proportion to their relative numbers.

CHAPTER 4

PROXIMATE DETERMINANTS 2: THE CHILDBEARING SPAN AND NATURAL MARITAL FERTILITY FACTORS

Even in the absence of deliberate attempts at birth control, marital fertility of different populations can vary substantially. Bongaarts (1978) has grouped together a number of intermediate variables that can affect the level of marital fertility other than the practice of contraception and abortion and has labeled them "natural marital fertility" factors. In this chapter, we review three of those factors for Thailand: primary sterility, coital frequency, and the postpartum nonsusceptible period. We start out, however, with a review of evidence about the length of the biological childbearing span. This is not strictly a determinant of marital fertility per se since marriage and hence marital fertility typically begin sometime after the onset of menarche. Nevertheless, the topic fits into the general theme of this chapter. Moreover, the end of the childbearing span directly influences marital fertility at older ages and even the age of marriage may be loosely linked to the age at which reproductive capacity begins.

THE CHILDBEARING SPAN: AGES AT MENARCHE, MENOPAUSE, AND LAST BIRTH

The reproductive spans of men and women are ultimately limited by biology. Since the ages at which women are capable of reproducing generally fall within a narrower and more clearly defined range, most research in Thailand and elsewhere has focused on the limits of the female reproductive span. The onset of menarche and menopause clearly represent the outside limits of a woman's potential reproductive years. In actuality, the physiological ability to bear a live birth typically

begins sometime after menarche, as reflected in the well-known concept of "adolescent sterility" (or more accurately, adolescent subfecundity). Likewise, the ability to bear a live birth typically ends sometime before the onset of menopause (Gray, 1976, 1979a). As difficult as it is to accurately measure the average age of menarche and menopause in a population, it is all the more difficult to measure the average age at which the ability to reproduce actually begins and ends. The age of mother at last birth among women past the end of the childbearing span can give us an indication of the latter in predominantly natural fertility populations.

There are several studies that provide some indication of the age of menarche in Thailand. The results are summarized in Table 25. None of the studies are based on a representative national cross-section of the Thai population but rather on regional or specialized samples. Comparisons across studies are further limited by the necessity to impose different restrictions on the cases included in the calculations in order to ensure comparability within each study when internal comparisons are possible. A particular problem when evaluating results of studies on retrospectively reported ages at menarche is the possibility that the results suffer from "censorship" bias when some of the respondents are younger than the latest age at which menarche can occur. The problem is similar to that discussed in connection with respect to age at first marriage in Chapter 3. Only women who have already experienced menarche can report on an age at menarche, and thus responses for women who experience menarche at early ages are disproportionately represented among women who are below the latest age at which menarche occurs. The result of such censorship is to bias the estimated age at menarche downward.

Presumably the onset of menarche was left to be defined by the respondent, and responses were given directly in terms of age. Since Thais appear as likely to report ages in terms of age at next birthday as they are to report age at prior birthday, the average age at menarche of women reporting age x is probably exactly x rather than x plus one half year, as would be the case if they were reporting their age at prior birthday (see Chapter 2, footnote 4). Because of this tendency for Thais to round their age to the nearest birthday, no adjustment has been made for converting stated age to exact age when calculating the mean and median ages at menarche.

TABLE 25 Reported Age at Menarche from Selected Studies: Thailand

Date of Study	Source	Reference Population	Age at Menarche: Mean	Age at Menarche: Median	Number of Cases
1977	A	Currently married women 15-49 in northeast	15.8	--	7,850
1977-78	B	Once-married women 15-54 in Chiang Mai Valley, northern Thailand	15.8	--	ca. 305
1952-54	C	Reproductive-aged women in village near Bangkok	15.3	14.7	94
1978-79	D	Ever-married women 20-44			
		Bangkok general sample	14.1	14.6	497[a]
		with 0-4 years of school	14.3	14.9	334
		with 5+ years of school	13.4	13.9	160
		Bangkok slum sample	14.2	14.7	461[a]
		with 0-4 years of school	14.2	14.7	427
		with 5+ years of school	14.4	15.1	33
		Central Thai village, relatively developed	14.2	14.6	612[a]
		with 0-4 years of school	14.1	14.6	527
		with 5+ years of school	14.1	14.5	81
1979	E	Bangkok massage girls	14.4	15.0	992
1943-64	F	Bangkok medical students	13.1	13.6	331

1978	G	Single women 15-20 who experienced menarche under age 15			
		Bangkok school girls	12.5	12.9	169
		Bangkok factory workers	13.2	13.5	84
		northeast school girls	12.8	13.2	157
		northeast factory workers	13.2	13.5	60
?	H	Bangkok hospital outpatients and others			
		born 1923-27	15.1	--	--
		born 1953-57	13.6	--	--

Note: In some cases means or medians were calculated or recalculated based on data presented in source rather than being directly taken from source.

[a]Includes some women of unknown educational attainment.

Sources:
A Porapakkham and Bennet (1978:78).
B Cochrane and Nandwani (1981:Table 2).
C Hauck (1956:30).
D Chamratrithirong (1982).
E Muangman and Nanta (1980:47).
F Bhumipadhi (1965:521).
G Muangman (1979:55)
H Trisiripisarn et al. (1974:92).

The first study reported is based on the FPHH survey and involves by far the largest number of respondents. Moreover, it is representative of the widest population of all the studies shown, since the sample was intended to be more or less representative of the entire northeastern region. The mean reported age of menarche, close to 16, is relatively late compared to the 12 to 13 years typical of industrialized countries and of several developing countries with presumed high standards of health, such as Cuba (Gray, 1979b).

This late age at menarche is confirmed by the second set of results, which come from another recent study based on a much smaller sample of women from 22 villages in the Chiang Mai Valley in northern Thailand. In both the FPHH and the Chiang Mai samples the proportions of women who were under age 20 were quite small--5 percent and 3 percent, respectively--so the results suffer very little from the censorship bias referred to above. Moreover, since censorship biases the estimates toward a younger age, it cannot help explain the rather late mean ages of menarche indicated. The Chiang Mai Valley Study examines the relationship between age at menarche and age at marriage. Interestingly, the results show a significant positive association between the two in a multivariate regression analysis (Cochrane and Nandwani, 1981).

A slightly younger mean age of menarche is indicated in the third set of results, based on a small study conducted in the early 1950s in a village about 20 miles from Bangkok. Again, any censorship bias should be small since women within the entire reproductive span were interviewed, although insufficient detail is provided to judge what proportion were still in adolescent ages. The study also involved clinical examinations and the investigator noted that none of the girls between ages 12 and 14 examined had passed menarche (Hauck, 1956).

The fourth set of results (D in Table 25) is based on the Asian Marriage Survey (AMS) and refers to the three subsamples included: a representative sample of evermarried women in the reproductive ages in Bangkok generally, in a slum area of Bangkok, and in a relatively developed village in the central plains. Since virtually all women reported experiencing menarche prior to age 20, calculations were based on women aged 20 through age 44, the age of the oldest woman included in the sample. Both the median and mean age at menarche are very similar across all three subsamples, falling between 14 and 15 with the mean approximately a half year higher than the

median. These figures are younger than those for the northeastern and Chiang Mai samples but agree rather closely with the following set of results from a study of Bangkok massage girls. While no age restrictions were imposed on the sample of massage girls, only 15 percent were under age 20 and undoubtedly most of these were in their late teens (Muangman and Nanta, 1980).

There is considerable evidence suggesting an inverse association between nutritional status and the age at menarche (Gray, 1982). This might account for the somewhat later age at menarche indicated for Thailand in comparison to the more industrialized countries. Possibly the later ages at menarche reported for the northeastern region, the poorest in the country, and the Chiang Mai villages, compared to the AMS subsamples can also be interpreted in this way. Other evidence from Thailand indicates an inverse association between socioeconomic status and average age at menarche, which could be attributable to nutritional or health differences. Data from the AMS subsamples are shown subdivided by educational attainment of respondents. Presumably the better educated women are on average from better backgrounds and were probably better nourished in their youth. In the general Bangkok sample, women with five-plus years of schooling reported experiencing the onset of menarche approximately one year earlier than those with less schooling. The same difference does not show up for the other two subsamples, but this may partially reflect the smaller sample sizes of better educated women in the Bangkok slum and the semi-rural areas.[1]

The lower age at menarche found for female medical students, the next set of results shown, compared to the massage girls or the three subsamples in the AMS is also suggestive of the influence of nutrition and health, since the medical students surely come from relatively higher socioeconomic backgrounds. Some of the difference, however, could be due to differences in the way age is stated (there may be less rounding of age among the university-educated population) and possibly to censorship of the sample if not all of the students had yet experienced the onset of menarche. No information on this latter point was provided in the published results of the study.

The results based on nonrepresentative samples of schoolgirls and adolescent factory workers in Bangkok and a provincial town and peri-urban area in the northeast region (set G) also point to an inverse association with

socioeconomic background. Since the age distributions of the samples of schoolgirls and factory workers were quite different, it was necessary to restrict calculations to girls 15 or over who had experienced menarche prior to age 15 to avoid differential truncation biases. Because of these restrictions, the results show very early ages at menarche and cannot be compared directly with results from other studies. The internal comparisons, however, are of interest and indicate an earlier age at menarche for the schoolgirls than for factory workers. Since the schoolgirls came from higher socioeconomic backgrounds (Muangman, 1979), this finding is consistent with the suggestion that nutritional status is exerting an influence on the onset of menarche.

There is substantial evidence that the age at menarche in Western societies has declined by about three years since the end of the last century (Bongaarts, 1980a; Wyshak and Frisch, 1982; see, however, Bullough, 1981). It is generally agreed that this decline is associated with an improvement in diet and nutritional status. The final set of results in Table 26 come from a study of a nonrandom sample including a substantial number of outpatients from a Bangkok hospital, which also suggests a decline in the age at menarche. According to this study, the mean age at menarche fell from just over 15 for women born in 1923-27 to less than 14 for women born in 1953-57. These results, however, must be viewed with considerable caution. Only a preliminary report of the study with few details has ever been published. Since it seems likely, judging from the date of the study, that not all members of the younger cohort would have

TABLE 26 Mean Age at Menarche by Age and Residence, Currently Married Women Aged 20-44: Thailand

Age Group	Total		Bangkok General		Bangkok Slums		Semi-Rural Area	
	Mean	N	Mean	N	Mean	N	Mean	N
20-24	14.2	283	14.2	65	14.3	115	14.1	103
25-29	14.6	390	14.4	140	14.8	113	14.6	137
30-34	14.7	310	14.5	109	14.8	79	14.8	122
35-39	14.7	292	14.8	92	14.9	77	14.6	123
40-44	14.9	294	14.9	91	15.0	77	14.8	126

Source: Chamratrithirong (1982).

experienced menarche at the time the data were collected, the lower age at menarche for the 1953-57 cohort may result from basing the calculations on a censored sample. In addition, the extent and direction of recall error might differ among younger and older women as might also the composition of the different cohorts with respect to other characteristics associated with the onset of menarche.[2]

Data from the AMS can be examined for evidence of trends by comparing the mean age at menarche for different age cohorts. To avoid any bias due to censorship, the analysis was restricted to women aged 20 or over. The results, shown in Table 26, also suggest that the mean age at menarche has declined in Thailand in recent years. For the combined set of three subsamples, an almost uninterrupted fall from 14.9 to 14.2 years of age is indicated for successively younger age cohorts. The median age at menarche (not shown) also declines steadily from cohort to cohort, from 14.3 to 13.8. Indeed, similar trends are evident for each of the subsamples, with only minor irregularities apparent. In each subsample, as in the total sample, the mean age at menarche decreases by 0.7 years between the oldest and youngest age group. A similar tabulation of mean age at menarche by current age from the Chiang Mai Valley Study also indicates a rise with age and thus is consistent with a decline over the last generation. Women aged 45-54 reported a mean age at menarche just over 16, while women 20-24 reported menarche occurring about a year earlier (Cochrane and Nandwani, 1981).

The results from the AMS and the Chiang Mai Valley Study indicating a decline in age at menarche should be viewed with caution, since they are based on retrospective reports and are subject to recall error, which might well differ in extent and direction for different age groups. Moreover, they refer to specialized samples which cannot be generalized to the national population without serious reservations. Nevertheless, they are at least suggestive of a decreasing age at menarche in Thailand.

Information on the age at menopause in Thailand is scarcer than that on age at menarche. The study based in part on Bangkok hospital outpatients (referred to above and in Table 25) is the only one we have been able to locate purporting to have such data. The results indicate an increase in the mean age at menopause from 44.7 for women born in 1898-1903 to 48.1 for women born

in 1913-1917 (Trisiripisarn et al., 1974). This is a striking increase over such a short period of time, but due to lack of details in the preliminary report, it is difficult to assess the reliability or validity of these findings. According to the report, the results for both the age-at-menarche and the age-at-menopause data are based on a total of 1,000 cases. It is not clear, however, how many women served as the basis for the results for each cohort.

Gray (1979a, 1979b) has summarized results from a number of studies on the age at menopause in different countries. He finds considerable consistency in the mean age at menopause among recent studies of Caucasian women, with results falling in the narrow range of 48.7 to 49.8. However, studies for populations in developing countries indicate median ages at menopause as low as 44 in the Punjab in 1966 and 43.6 among malnourished women in New Guinea in 1973. Thus the figures provided by the Thai study fall within the ranges found in other studies, with the higher estimate for the more recent cohort approaching the mean age at menopause in Western countries.

Although the FPHH survey of northeastern women could not collect data on actual ages at menopause, since the sample was largely premenopausal, it did include a question about the age at which the respondent expected a normal woman to have menopause. The average age mentioned was 48.8, indicating that the women do not think menopause is particularly early in Thailand (Porapakkham and Bennett, 1978:74).

While menopause marks the termination of a woman's reproductive life, the onset of secondary sterility and thus the effective end of a woman's ability to reproduce occurs somewhat earlier. A variety of studies in populations thought to be characterized by natural fertility suggest that the mean age at last birth, a more meaningful measure of the end of a woman's fertile period, is close to 40 (Bongaarts, 1980a; van de Walle and Knodel, 1980). In populations where a significant amount of birth control is practiced, the average age at last birth can no longer be accepted as an indication of the age at which women lose the ability to bear children. Even in some populations where there is an absence of deliberate behavior to limit family size, social customs might dictate terminal abstinence associated with attainment of grandmaternal or mother-in-law status (Knodel, 1982). In such circumstances, the mean age at last birth would reflect the socially defined, if not physiologically defined, end of reproductive ability.

TABLE 27 Attitudes Regarding When Women Should Cease Sexual Relations as Reported by Ever-Married Women Aged 15-44: Thailand

		Bangkok General	Bangkok Slum	Semi-Rural
Percent indicating women should cease sex by menopause		69.5	83.4	81.6
	N	514	507	657
Percent indicating women should cease sex relations prior to age[a]:				
	40	3.8	2.7	3.6
	45	27.8	31.3	33.1
	50	44.8	50.2	43.0
	N	446	438	589

[a]Excluding respondents coded as don't know, no answer, or depends.

Source: Chamratrithirong (1982).

For Thailand, there is a notable absence of references to the practice of terminal abstinence associated with becoming a grandmother or mother-in-law, and thus we suspect no such social custom operates in Thailand. The AMS, however, included several questions on attitudes toward when women should cease sexual relations. Ever-married women in their reproductive ages were asked specifically whether a woman should cease having sex relations by the onset of menopause as well as the age at which they thought a woman should cease sex relations. Results are presented in Table 27. In all three subsamples, the large majority of respondents agreed that the woman should cease sex relations by menopause, although the proportion in the general Bangkok sample was considerably lower than in either the Bangkok slum or the semi-rural area. When asked at what age women should cease having sexual relations, over 40 percent replied age 50, and almost as many replied either age 40 or 45, most likely reflecting the age at which they assumed a woman reaches menopause. Given that very few women feel that sex relations should stop before age 40 or even before age 45, terminal abstinence would seem to exert little influence on reproductive behavior in Thailand. Such a conclusion must be stated cautiously, however, since these data are attitudinal and may not reflect actual practice of terminal abstinence. It would be

useful to attain behavioral data on the age at which women cease sex relations as well as the extent to which this is linked to menopause or to their own children starting families.

Since very little contraception was practiced among married women at the time of the first round of the Longitudinal Study and only two of the more than 300 women aged 45 or older indicated they had ever practiced contraception, it is possible to treat these women as if they came from a natural fertility population. The average age at which these women bore their last child should therefore reflect the effective end of the childbearing span as determined by fecundity in combination with coital frequency (since some couples will undoubtedly be abstinent even in the absence of any normative proscription on intercourse associated with age or stage of family cycle). Due to the coding procedures followed, women whose last birth occurred after age 45 must be excluded from the analysis. This leads to a slight downward bias in the age of mother at last birth compared to what the results would be if all women were included. By comparing successive age groups above age 45, it is possible to determine whether there appears to be a trend over time in the average age at last birth. Results are presented in Table 28 for women aged 45 and above. Some widowed, divorced, or separated women experienced marital dissolutions prior to age 45, potentially biasing down-

TABLE 28 Age of Mother at Last Birth Prior to Age 45, Among Rural Currently Married and Ever-Married Women, Aged 45 and Above, Whose Last Birth Occurred Prior to Age 45: Thailand

Age at Survey	Currently Married Women			Ever-Married Women		
	Mean	Median	N	Mean	Median	N
45-49	38.0	39.4	112	37.6	38.7	139
50-54	37.8	38.3	67	37.5	37.2	80
55-59	38.6	39.5	37	38.3	39.1	62
60-64	36.8	40.0	15	37.0	39.5	22
65+	37.9	40.5	14	38.3	40.5	20
All women 45+	38.0	39.1	245	37.7	38.8	323

Source: LS1.

ward the age at last birth for ever-married women. Since this appears to be a minor problem, however, and the number of cases, particularly for women at older ages, is so small, results for ever-married women are shown along with those for currently married women. Given the downward bias due to the omission of women whose last birth occurred after age 45, the overall results indicate an age of mother at last birth reasonably close to that in other natural fertility populations. Of greater interest is the lack of any apparent trend over time in the age of mother at last birth, although the small number of cases, particularly at older ages, and the somewhat different pattern of fluctuations based on the mean and median preclude any definitive conclusions in this respect.

PRIMARY STERILITY

In any population, at least a small proportion of couples are unable to bear any children because of physiological impairment of either or both of the spouses. If we assume that voluntary childlessness is negligible in Thailand, then the extent of primary sterility (the inability to bear any children) can be approximated by the proportion of ever-married women who remained childless to the end of the reproductive age span. The results presented in Table 29 indicate primary sterility in Thailand is quite low in any absolute sense. Among ever-married women aged 45 or above, less than 4 percent in the 1960 census and only about 2 percent in the 1970 census reported never having had a live birth. This indicator should be taken only as a rough estimate of primary sterility and could either overstate or understate the true level, since biases are operating in both directions. For example, to the extent some couples deliberately remain childless, we would be overestimating the extent of biological sterility. In addition, while the slight rise with age in the percent childless apparent in both the 1960 and 1970 censuses might reflect a decline over time in primary sterility, it could also reflect an increased tendency for older women to underreport births and, especially if all their children died, to report no children ever born, hence biasing the estimate of childlessness upward. Moreover, the percent childless only reflects primary sterility as existing at the time a woman first begins cohabiting, leaving open the question of whether the woman or her husband were previously fecund.

TABLE 29 Percent Childless and Percent with Unknown Number of Children Ever Born Among Ever-Married Women Over Age 45, by Age: Thailand

Age	1960 Census		1970 Census	
	Percent Childless[a]	Percent Unknown	Percent Childless[a]	Percent Unknown
45-49	3.2	3.5	1.7	3.6
50-54	3.5	3.9	1.8	4.1
55-59	3.8	4.5	2.0	4.6
60-64	4.2	5.6	2.5	
65-69	4.2	6.8	2.5	7.2
70+	4.0	8.9	2.5	
45+	3.7	5.0	2.1	5.2

[a]Excluding from the denominator women with unknown number of children ever born.

Other influences could result in this measure understating the level of primary sterility. There is reason to suspect that a disproportionate number of women classified as having an unknown number of children ever born are in fact childless. This situation could arise if there were a tendency for enumerators to leave a blank space or enter only a dash on the census questionnaire instead of entering a zero for women who stated they had no children. In data processing, these responses are likely to be treated as indicating an unknown number of children. Such a pattern has been noted for a number of censuses (El-Badry, 1969) as well as for the 1960 Thai census (Goldstein, 1970:327-338). Thus some proportion of the percent of women listed as having an unknown number of children ever born should be included with the percentage childless. Since the increase in this percentage after age 45 probably reflects a genuine increase in the proportion of women who do not remember the number of live births they had, the percent with an unknown number of children ever born among women 45-49 represents the maximum extent of misclassification. Indeed, it would undoubtedly be an exaggeration to assume that all of these women were actually childless. However, even if they were, the extent of primary sterility would still not be extremely high. In this connection, it is interesting to note that the proportion childless among

the more than 400 ever-married women aged 45 and above included in the rural round of LS1 was only 3.2 percent (and only 2.3 percent among the 171 ever-married women aged 45-49, for whom memory error is probably less). It seems much less likely that the Longitudinal Study would have misclassified many childless women as having an unknown number of children ever born, since detailed pregnancy histories were called for and the very few cases of women with an unknown number of children ever born were largely limited to older women, for whom recall problems seem more plausible.

Despite the variety of biases operating on the percent childless as a measure of primary sterility, we believe it is safe to conclude that primary sterility in Thailand is low and not far from the 2- to 3-percent level. We are much more hesitant to draw conclusions about trends in primary sterility from the existing data other than to mention that to the extent the data suggest a trend, it is toward a decline. It is possible, however, that an increase in primary sterility could occur in the future as a result of an increase in venereal disease, especially in urban areas.

There is considerable concern in Thailand about a potential increase in the incidence of both syphilis and gonorrhea, since statistics indicate sharp increases in the reported cases treated, rising fairly steadily from 10 per 100,000 population in 1950 to 24 in 1975-77 for new cases of early syphilis, and from 9 per 100,000 in 1950 to 647 in 1975-77 for gonorrhea (Limanonda and Suwannodom, 1979). Of relevance for primary (or secondary) sterility, of course, is the overall prevalence of venereal disease, not just the incidence of treated cases, and the extent to which cases receive early treatment. Such statistics are not available. Apparently in the early 1930s, venereal disease was rare. According to Zimmerman (1931:229-300), careful physical examination by government physicians of about 10,000 people located in groups of 250 in 40 representative areas revealed virtually no venereal disease outside the large market places or port cities. The sharp rise in treated cases, especially for gonorrhea, would seem to point to some increase in general prevalence. Pathological levels of primary sterility associated with venereal disease are known to characterize some parts of tropical Africa as well as some New Guinean populations and to exert an important influence on their fertility (Gray, 1982; Knodel, 1982). Thus the potential for an increase from

the low levels of primary sterility currently characterizing Thailand appears real if the alleged increase in venereal disease really exists and continues.

COITAL FREQUENCY

One of the proximate variables for which reliable and representative information is rarely available for most populations is coital frequency (Nag, 1982). Table 30 summarizes results of four studies that provide information on this variable for Thailand. Three of the four

TABLE 30 Reported Weekly Coital Frequency from Selected Studies: Thailand

Part A. Among currently married respondents in a national rural sample, by age and sex, 1975

Weekly Frequency	As Reported by Married Male Respondents			As Reported by Married Female Respondents			Both Sexes
	15-34	35+	Total	15-29	30-44	Total	
3+	45.9	13.7	29.0	41.0	15.1	25.6	27.9
2	23.3	15.9	19.3	29.3	19.8	23.5	20.7
1	22.6	26.2	24.4	18.6	24.1	21.4	23.4
Less than 1	8.3	44.3	27.3	11.2	40.9	29.4	28.0
Total Percent	100	100	100	100	100	100	100
Mean	2.6	1.3	1.9	2.5	1.4	1.9	1.9
Median	1.8	0.6	1.0	1.7	0.7	1.0	1.0
N[a]	412	454	869	188	232	429	1,298

Part B. Among male clients at family planning clinics of Chulalongkorn Hospital, Bangkok, by age and vasectomy status, 1976-78

Weekly Frequency	Vasectomized Men				Nonvasectomized Men				All Men
	15-29	30-39	40+	Total	15-29	30-39	40+	Total	
5+	18.0	14.3	11.7	14.2	9.0	9.4	6.2	8.8	11.5
3-4	34.4	33.2	38.3	34.6	43.0	33.3	27.7	34.8	34.7
1-2	44.3	47.1	42.6	45.5	42.0	51.7	50.8	49.1	47.3
Less than 1	3.3	5.5	7.4	5.6	6.0	5.6	15.4	7.3	6.4
Total percent	100	100	100	100	100	100	100	100	100
Mean	3.0	2.8	2.7	2.8	2.7	2.5	2.2	2.5	2.6
Median	1.6	1.4	1.5	1.5	1.6	1.4	1.2	1.4	1.4
N	61	238	94	393	100	234	65	399	792

studies are based on quite specialized samples and, as discussed below, the results appear to be quite sensitive to the type of question asked.

The most representative sample for which coital frequency data are available comes from the 1975 Westinghouse Rural Population Survey, which included rural

TABLE 30 (continued)

Part C. Among men vasectomized at Ramathibodi Hospital, Bangkok, prior to and subsequent to the operation, 1974-76

	Pre-Operative	Post-Operative
Mean	2.1	2.5
Median	1.8	1.8
N	463	464

Part D. Among currently married women aged 15-44, in a Bangkok suburb by contraceptive practice status, 1967-69

Frequency in Week Prior to Interview	Practicing Contraception	Not Practicing Contraception	Total
4+	6.1	7.0	6.7
3	10.7	9.6	10.1
2	17.4	14.4	15.5
1	35.7	30.7	32.6
0	30.1	38.2	35.6
Total percent	100	100	100
Mean	1.3	1.3	1.3
Median	0.6	0.4	0.5
N	345	570	915

Notes: Part A: Respondents coded "no answer" are excluded. Mean and median calculated on assumption that the "less than 1" category equals 0.5 and "3+" category equals 4.0.

Part B: Respondents with unknown coital frequency are excluded. Mean and median are calculated on assumption that the "less than 1" category equals 0.5, the "1-2" category equals 3.5, the "3-4" category equals 3.5, and the "5+" category equals 6.0.

Part C: Respondents coded unknown were excluded. The mean and median were calculated by dividing the monthly mean and median by 4.3.

Part D: Respondents with unknown coital frequency are excluded. Mean is based on disaggregated frequencies in "4+" category.

[a]Figures refer to weighted Ns and thus do not sum exactly to total.

Sources: Part A: WRPS (Deemar Company, Ltd. [1975, Vol. 2:Table 15]).
Part B: Popuang (1980:Tables 18 and 19).
Part C: Sethaput and Leoprapai (1977:Table 25).
Part D: Muangman et al. (1973).

respondents in all four major regions. Since this survey included both men and women, it is possible to examine responses by sex of respondent. The results do not support the idea that men exaggerate and women minimize coital frequency, as is sometimes expected. As indicated in Panel A, married men and women reported remarkably similar frequencies of intercourse. Both sexes indicated a mean weekly frequency of 1.9 times and a median of once a week. As would be expected, coital frequency is inversely related to age, with substantial differences indicated between the younger and older portions of the sample.

A less striking though similarly inverse relationship with age is indicated in Panel B based on a specialized study comparing coital frequency among vasectomized and nonvasectomized men receiving services through a Bangkok hospital. The overall coital frequency, whether measured by mean or median, is somewhat higher for both the vasectomized and nonvasectomized men in this study than was indicated by the results for the rural sample in Panel A. Likewise, results from a different study of men receiving vasectomies at another Bangkok hospital, presented in Panel C, indicate that both pre-operative and post-operative rates of coital frequency are also somewhat higher than for the rural sample. In both of these Bangkok studies, the reported mean coital frequency was between two and three times a week and the median between one and two times a week. It is not clear in these studies whether men were reporting only coital frequency with their wives or also included sexual relations with prostitutes. This might account for the difference between the coital frequency rates reported by the Bangkok sample and the rural sample, although undoubtedly many other factors could also influence the results.

The results in Panel D are based on a study in Bangkhen, a Bangkok suburb, and are of particular interest both because the respondents were women and, more importantly, because the data were elicited by what appears to be a different methodology for determining coital frequency. Presumably in the other three studies, respondents were asked a general question on coital frequency rather than one that specifies a particular reference period. In the study summarized in Panel D, respondents were given an envelope containing a card listing the days of the week and were asked to mark the days of the previous week on which they had sexual

relations with their husbands. They were then asked to put the card back in the envelope and return it to the interviewer. This approach has both the advantage of privacy and the fact that it has a concrete period of reference. It does not, however, permit a respondent to indicate more than one act of coitus in any given day. Results were tabulated according to whether or not the women were practicing contraception.

The most striking features of the results in Panel D are the considerably lower rates of coital frequency compared to other studies. Indeed, around a third of the women indicated that they had not had intercourse in the previous week. Quite likely a considerable share of those not having intercourse were experiencing menses. At least one anthropologist indicates that intercourse during menstruation is generally avoided (Mougne, 1978). In addition, about 12 percent of the respondents indicated their husbands had not been home during the reference week (Udry et al., 1982).[3] Given the very different nature of the samples on which these studies are based, it is not possible to say definitively that the difference in methodology accounts for the lower rates of coital frequency reported in the Bangkhen study, but such an explanation is certainly plausible.

BREASTFEEDING PATTERNS AND THE POSTPARTUM NONSUSCEPTIBLE PERIOD

Among the most important determinants of fertility in the absence of deliberate birth control are lactation practices. The contraceptive effect of breastfeeding is well documented (McCann et al., 1981). Prolonged lactation protects against pregnancy by delaying the postpartum return of ovulation and thus extends the period of nonsusceptibility to conception following a birth. Changes in breastfeeding practices can therefore have a significant effect on fertility trends.

Information on the prevalence and trends in breastfeeding practices are available from several of the national sample surveys. A recent study that extensively analyzed these data has clearly documented a moderate and relatively steady decline in the duration of breastfeeding during the same period that fertility has been declining (Knodel and Debavalya, 1980). The results, summarized in

Table 31, and Figure 4 indicate that sharp rural-urban differences in breastfeeding persisted throughout the period while parallel declines took place in urban and rural areas. In either case the estimated mean duration of breastfeeding fell by almost five months. The evidence on changes in the prevalence of breastfeeding is less clear as measured by the percentage of last-born children who were never breastfed. The data indicate that breastfeeding is almost universal in rural areas, although the prevalence may have declined slightly over the last few years. Even in urban areas, three fourths of last-born children were breastfed for at least a short period of time.

Additional information on breastfeeding is provided by CPS2, taken in 1981. Since information on breastfeeding was asked only of women who had a surviving birth during the two years prior to the survey, indexes comparable to those presented in Table 30 cannot be calculated. However, a rough comparison of the percent of women still breastfeeding their most recent birth can be made with results for NS, which took place in 1978, by also restricting the calculations for NS to women with a birth

TABLE 31 Indexes of Breastfeeding from Selected Surveys, 1969-79: Thailand

	Rural				Urban			
Index	LS1 1969	LS2 1972	SOFT 1975	NS 1979	LS1 1970	LS2 1973	SOFT 1975	NS 1979
Percent still breastfeeding[a]	72.4	71.0	67.2	55.6	41.6	30.9	31.3	25.8
Mean duration of breastfeeding per child (months)[b]	22.4	22.0	20.9	17.5	12.9	9.9	9.7	8.4
Percent of last-born child never breastfed	--	--	6.4	9.6[c]	--	--	25.8	24.4[c]

-- indicates information not available.

[a]Among nonpregnant women with a child under 3. Standardized for months since last birth by applying equal-weights standardization procedure to results tabulated by successive categories of 4 months duration each.
[b]Based on proportions still breastfeeding by age of child in months.
[c]Standardized for age of mother using the age distribution of respondents to the equivalent question in the equivalent residence category in the SOFT sample.

Source: Adapted from Knodel and Debavalya (1980).

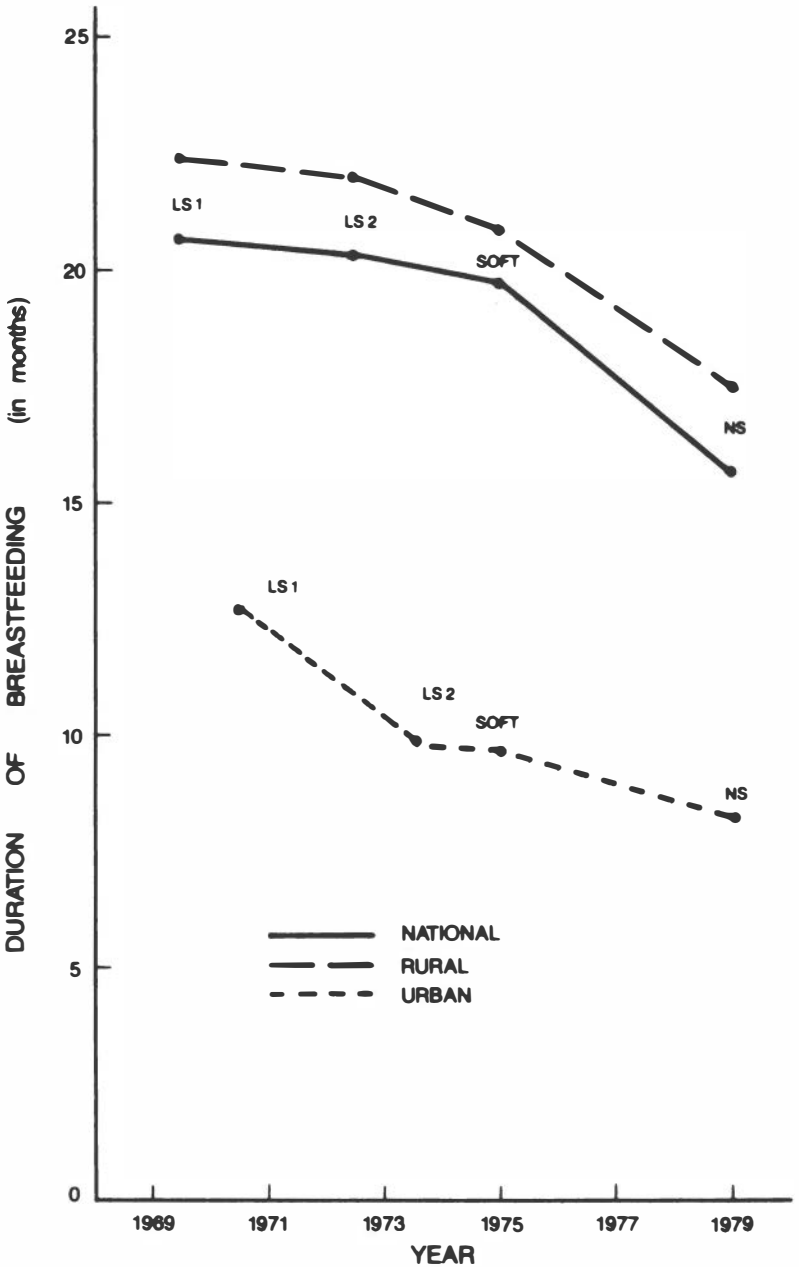


FIGURE 4 Mean Duration (in months) of Breastfeeding from Selected Surveys, 1969-70 to 1979: Thailand

in the two years prior to interview. After standardization for months since last birth, the resulting calculation indicates 67 percent of rural women still breastfeeding in NS and 66 percent two years later in CPS2, while for urban women the comparable figures are 36 percent still breastfeeding for NS and 34 percent for CPS2 (Knodel et al., 1982). Since the CPS2 calculations are restricted to women with a surviving child while NS calculations are not, the CPS2 figures probably overstate to a small extent the percent of women still breastfeeding relative to the NS results and thus understate slightly an apparent continuation of a decline in breastfeeding between the two surveys.[4]

In addition to collecting information on breastfeeding in general, CPS2 contained questions about when non-milk foods were first fed to the child and about how long ago the respondent experienced her last menstrual period. These data from CPS2 provide the basis not only for estimating the median duration of any breastfeeding but also a rough approximation of the median duration of "full" breastfeeding and of postpartum amenorrhea. Moreover, while CPSI included no questions on breastfeeding, it does provide data on how long ago the respondent experienced her last menstrual period and also can be used to calculate duration of postpartum amenorrhea. Results are presented in Table 32.

In general, the results for CPS2 confirm those from earlier surveys in indicating that the vast majority of both rural and urban women breastfeed their children for at least some period of time. The percent of mothers who never breastfed based on the CPS2 data differ from those presented for earlier surveys in Table 31 inasmuch as they are based only on surviving births and are limited to the most recent birth during the last two rather than three years. The exclusion of nonsurviving births probably lowers the estimate of the percent of mothers who never breastfed their most recent birth, since deceased children are less likely to have been breastfed. In addition, sampling error, especially for relatively small urban portions of the samples, also contributed to differences in the sets of estimates, which argues against treating the comparison as an indication of trends. Hence, while it is possible that the higher prevalence of breastfeeding in urban areas indicated by CPS2 compared to NS may reflect a general increase between 1979 and 1981, we do not feel that firm conclusions can be drawn from a comparison of the two surveys.

TABLE 32 Indexes of Breastfeeding Among Women with a Surviving Birth in the 24 Months Prior to 1981 Interview and Estimated Median Duration of Postpartum Nonsusceptibility, 1978-79 and 1981: Thailand

Index	National	Rural	Urban
Percent never breastfeeding	9.1	7.5	16.7
Median duration of breastfeeding (in months)[a]	16.6	18.5	4.0
Median duration of "full" breastfeeding by women who start breastfeeding (in months)[b]	2.1	2.0	2.6
Median duration of postpartum non-susceptibility (in months)[c]			
1978/79	4.9	6.0	2.1[d]
1981	4.7	5.1	3.1

[a]Includes women who never breastfed as duration 0.
[b]Derived by life table techniques.
[c]Estimated from data on time since last menstrual period.
[d]Excluding provincial urban

Source: Adapted from Knodel et al. (1982).

The CPS2 results confirm that rural Thai women breastfeed for much longer durations than their urban counterparts. Indeed, the results indicate that half of rural mothers breastfeed their surviving children for at least a year, compared to only four months for urban mothers. The results on duration of breastfeeding from CPS2, however, cannot be compared directly to those presented for earlier surveys, both because the CPS2 results are for medians rather than means and refer to women rather than to children.[5]

When we focus on the median duration of full breastfeeding, a considerably different picture emerges. Since the information on the introduction of supplemental foods is limited to non-milk foods and ignores the possibility that some mothers may have provided their infants with commercial milk products at an even earlier age, the duration of full breastfeeding may be somewhat overestimated from the present data. To underscore the qualified definition of full breastfeeding, the term has been placed in quotation marks in Table 32. The striking feature of the estimates of full breastfeeding is the very short duration that they indicate, despite the possibility that these estimates may overstate its

extent. Clearly, women who breastfed their children introduced non-milk foods into the diet very early. This is true of both rural and urban women. Indeed, the estimated duration of full breastfeeding is slightly shorter for rural than for urban mothers. Findings from a 1979 survey done by Deemar Company under commission from several companies producing infant formula are quite consistent with the CPS2 results in indicating an early introduction of supplemental feeding and the lack of sharp differentials. According to the the Deemar findings, which were based on a random sample of mothers with infants under age 1, over 80 percent of mothers in both Bangkok and rural central Thailand had fed their infants non-milk foods before the age of four months regardless of social class (Gaither International, 1980:29).

The main interest in infant feeding practices for the study of fertility lies in the now well-established relationship linking prolonged lactation with delaying the return of ovulation and thereby extending the postpartum nonsusceptible period during which the woman is usually amenorrheic (Van Ginneken, 1978). Direct information on postpartum amenorrhea in Thailand is rare. Based on a retrospective survey conducted during the 1960s of women delivering in a number of Bangkok and regional hospitals, the mean duration of postpartum amenorrhea was estimated as six months (Van Ginneken, 1974). The sample, however, was clearly nonrepresentative as indicated by their reported mean duration of lactation of 12 months, undoubtedly below the national average at the time. This is not surprising given the probable overrepresentation of urban women in the sample compared to the national population.

More recent indirect estimates of postpartum nonsusceptibility are possible based on information collected in CPS1 and CPS2 on how long ago the respondent experienced her last menstrual period.[6] These estimates have the advantage of being based on representative samples. The striking feature of these results is the rather short period of amenorrheic postpartum nonsusceptibility they indicate for Thai women, suggesting that over half experience the return of menstruation within five months of giving birth. As expected from the longer duration of breastfeeding in rural areas, the return of menstruation is later for rural women than for urban women. However, even for rural women, the median duration of postpartum amenorrhea is only six months according to CPS1 and

slightly over five months according to CPS2, despite the fact that their median duration of breastfeeding is well over one year. Quite plausibly, the reason that breastfeeding in Thailand is not extending postpartum amenorrhea for longer periods may be the very short durations of full breastfeeding. There is considerable evidence available from a variety of studies indicating that the impact of breastfeeding on postponing the return of ovulation and thus extending amenorrhea is considerably less in the case of women who follow a mixed feeding regime (Van Ginneken, 1974).

The remarkably close agreement between the earlier estimate of a mean duration of six months based on the International Postpartum Program in the 1960s and the median durations based on the Contraceptive Prevalence Surveys should not obscure the fact that a decline in the average duration probably took place. Given that the earlier sample clearly underrepresented women who breastfed for longer durations, a more representative sample would surely have yielded a longer estimated duration of amenorrhea.

In brief, data on breastfeeding in Thailand suggest that a moderate decline in the average duration has taken place at the same time fertility has fallen. Nevertheless, breastfeeding is still close to universal, and substantially more than half of Thai women breastfeed for over a year. Supplemental food, however, is introduced at a very early age and probably reduces the potential inhibiting effect on fertility of the relatively long duration of breastfeeding. The median duration of postpartum amenorrhea is currently estimated at less than five months. Since the decline in the duration of breastfeeding has probably operated against the prevailing trend toward lower marital fertility, changes in other proximate variables must have more than counteracted it. As is demonstrated in the following chapters, the main reason marital fertility did not rise as a result of reduced breastfeeding was the massive increase in deliberate birth control, particularly the use of contraception.

NOTES

[1]According to a difference of means test (based on a simple random sample assumption), the difference between the two educational groups is statistically significant

at well beyond the .001 level for the general Bangkok subsample but not significant at even the .05 level for the other two subsamples.

[2]Two other studies of age at menarche in Thailand are cited by Bhumipadhi (1965). Both are apparently based on schoolgirls and thus could suffer from truncation bias. One study, published in 1932, reported a mean age at menarche of 13.7 and the other, dated 1962, reported a mean age of 13.9.

[3]A recent study based on the same data restricted analysis to those women who had husbands at home during the seven-day reference period, with a resulting monthly mean rate of coitus of 6.42 (Udry et al., 1982). This would translate into a weekly rate of 1.5, assuming 4.3 weeks to a month was used to convert the weekly frequencies into monthly ones. This is slightly higher than the mean of 1.3 indicated by Muangman et al. (1973). Presumably the difference is due to the exclusion in the more recent article of women whose husbands were not present. There is a minor discrepancy in total number of respondents indicated by the two articles, with the 1982 article stating 915 and the 1982 article stating 900. The 1982 article indicates that of the total 900 respondents, 95 or approximately 12 percent did not have their husband home at some time during the study period. The 1982 article apparently incorrectly reports that respondents were asked directly about coital frequency rather than being given cards to fill out privately (personal communication from J. Richard Udry).

[4]The effect cannot be large since less than 2 percent of women reporting a live birth in the two years prior to interviews reported that the birth did not survive. Given the prevailing levels of infant and child mortality in Thailand, the low percentage of women reporting a nonsurviving last birth suggests that there is some underreporting of those last births which died early in life. Presumably this affects all surveys equally.

[5]The average duration of breastfeeding per mother is usually longer than the average duration per child since women who breastfeed for short durations typically have more children than those who breastfeed for longer durations. Thus, in calculating an average per woman,

each woman is counted only once but when calculating an average per child, disproportionate weight is given to children of mothers who breastfed for short durations or not at all. For a full discussion of various methodological and conceptual problems in measuring prevalence and duration of breastfeeding, see Page et al. (forthcoming).

[6]For details on how the median duration of postpartum amenorrhea was calculated from these data, see Knodel et al. (1982).

CHAPTER 5

PROXIMATE DETERMINANTS 3: DELIBERATE MARITAL FERTILITY CONTROL

As indicated in Chapter 2, the recent fertility decline in Thailand has been largely a matter of reductions in marital fertility. Underlying this change has been a massive increase in the extent to which Thai couples deliberately limit their reproductive capacities by practicing birth control. In this chapter we examine this increase in deliberate marital fertility control in some detail, giving separate consideration to contraception and abortion. In addition, we consider briefly the extent to which infanticide and adoption are used as means of post-birth family limitation.

CONTRACEPTION

Systematic and representative information on the knowledge and practice of deliberate birth control within marriage is lacking for Thailand prior to 1969. Mention should be made, however, of the large-scale national Rural Economic Survey taken in 1930-31. While it undoubtedly does not conform to modern standards of sampling and survey technique, it nevertheless was the product of a self-conscious effort to collect a variety of representative social and economic data for rural Thailand based on field interviews in 40 villages in all regions. Apparently an effort was made to inquire about birth control. This study concludes ". . . the birth rate does not seem to be under human control. They [the respondents] do not know about birth control nor practice any form to any extent" (Zimmerman, 1931:230). Anthropologists frequently mention some form of abortion as being "traditional" although quantitative information is not provided (see, e.g., Riley, 1972:218; Mougne, 1978;

Lauro, 1979:11). Less frequent is any information on the extent to which traditional forms of birth control were known or practiced. Mougne (1978) mentions that lying by the fire for several weeks following a birth, a common practice in much of Thailand in the past, was thought of as a traditional form of birth control in the northern Thai village she studied. Riley (1972:324-325) indicates he found no evidence of planned abstinence or special practices for the purpose of birth control despite frequent inquiry into the subject during his field work in a central Thai village in 1970-71. He concludes that traditional birth control seems to have been limited to abortion. During field work in another central village during 1975-76, Lauro (1979) attempted to reconstruct detailed contraceptive histories of women in the village. Use of what he termed "modern contraception" was almost totally absent prior to the late 1960s, after which it increased substantially. Unfortunately, he does not seem to have inquired systematically into whether or not traditional forms of contraception were practiced. He notes, however (p. 107), that several of the older village women indicated that they had had large families themselves because, unlike present-day younger women, they had "lacked the means to control fertility" when they were in the prime childbearing years.

Postpartum abstinence of any extensive duration is apparently not commonly practiced in Thailand, judging from the lack of reference to it by most anthropologists. An exception is Mougne (1978), who reports that intercourse is generally said to be resumed soon after the end of the first postpartum month in the village she studied in northern Thailand.

KNOWLEDGE OF CONTRACEPTION

Evidence from national surveys, summarized in Table 33, clearly indicates that since 1969 there has been a marked increase in awareness of contraceptive techniques among both rural and urban women. At the time of the first round of the Longitudinal Study, about three out of four urban women were able to mention a method of contraception without being prompted, while slightly less than half of rural women could. Less than ten years later, almost all women, whether rural or urban, could mention at least one method. The most universally known contraceptive in Thailand is clearly the pill. It is also the most widely

TABLE 33 Contraceptive Knowledge Among Currently Married Women Aged 15-44: Thailand

Residence and Survey	Percent Knowing Method Without Prompting						Mean Number of Methods Known[a]
	IUD	Pill	Vasectomy	Ligation	Injection	Any[a]	
Rural							
LS1 1969	--	--	--	--	--	48	1.11
SOFT 1975	50	77	25	46	21	86	2.34
CPS1 1978/79	52	90	40	65	43	97	3.31
CPS2 1981	65	90	56	75	62	97	4.03
Urban							
LS1 1970	--	--	--	--	--	74	1.80
SOFT 1975	59	85	21	41	33	92	2.86
CPS1 1978/79[b]	59	87	28	59	45	98	3.49
CPS2 1981	68	94	49	72	65	98	4.35
National							
LS1 1969/70	--	--	--	--	--	53	1.23
SOFT 1975	51	78	24	45	22	87	2.41
CPS1 1978/79[c]	53	89	38	64	43	98	3.34
CPS2 1981	65	91	54	74	62	97	4.08

-- indicates information not available

[a]Including methods not listed.
[b]Bangkok metropolitan area.
[c]Excludes provincial urban.

Sources: Debavalya and Knodel (1979) and unpublished tabulations.

used method and the method most widely provided by the National Family Planning Program.

The average number of methods mentioned by respondents without prompting has also increased substantially over the last ten years, almost doubling for urban women and almost tripling for rural women. The pronounced urban-rural differential in contraceptive knowledge evident in 1969 narrowed considerably by 1975 and had virtually disappeared by the end of 1978. Thus almost all Thai women, both rural and urban, are now familiar with the idea of birth control and the large majority are aware of a reasonably wide range of specific modern methods.

The results of two regional studies conducted around the time of LS1 are also of interest. In 1969, a question on contraceptive knowledge was included in the Rural Employment Survey and asked of a sample of men in northern Thailand with wives in the reproductive ages. In 1970, a similar question was asked of men in southern Thailand. The results indicate that almost half of the rural northern Thai men and over three fourths of rural

southern Thai men indicated they had no knowledge of contraceptive methods (Jones and Rachapaetayakom, 1970; Jones and Soonthornthum, 1971).

Although there was some familiarity with contraception at the time of LS1, birth control methods were far less salient to women than they are now, especially in rural areas. While national-level data are not available prior to 1969, results of a 1964 survey of the Potharam district, a rural area about 80 kilometers from Bangkok, suggest that familiarity with contraception may have been considerably lower then and thus may also have been increasing rapidly during the 1960s. Of the more than 1,000 currently married women aged 20-44 interviewed in the Potharam district in 1964, approximately two thirds had ". . . no knowledge whatsoever of contraceptive methods" (Hawley and Prachuabmoh, 1971b:36).

With regard to traditional knowledge and practice of contraception, there is some information on awareness of nonmodern methods, particularly withdrawal, which in European populations was a major means of reducing fertility during the demographic transition. Unfortunately, such data are not available from the earliest survey, LS1. According to national tabulations from CPS1, conducted in 1978/79, only 23 percent of ever-married women, ages 15-49 indicated awareness of withdrawal as a birth control method, with 3 percent mentioning it spontaneously and another 20 percent indicating recognition when withdrawal was mentioned to them (Suvanajata and Kamnuansilpa, 1979:24). CPS2 results show a slightly higher awareness of the withdrawal method, with 29 percent indicating knowledge (Kamnuansilpa and Chamratrithirong, 1982). Results from NS in 1979, however, indicated considerably lower figures, especially for rural ever-married women: even with prompting, only 8 percent of them indicated any awareness of withdrawal as a contraceptive technique. The same study shows that only 16 percent of ever-married rural women aged 15-49 indicated awareness of abstinence as a method of limiting family size or spacing children (Institute of Population Studies, 1981). Presumably, this does not mean that Thai women are unaware of the connection between coitus and conception, but rather that they do not think of withdrawal and abstinence as ways of controlling their fertility and that these methods are not part of longstanding folk tradition.

CONTRACEPTIVE PRACTICE

Even more striking than the spread of contraceptive knowledge during the period under observation is the increase in contraceptive use illustrated in Table 34. For the country as a whole, the percentage of married women in the reproductive ages who reported currently practicing some method rose from less than 15 percent to

TABLE 34 Percent Currently Practicing Contraception Among Currently Married Women Aged 15-44, by Age and Place of Residence: Thailand

Residence and Year of Survey	Survey	Age of Women						All Ages	
		15-19	20-24	25-29	30-34	35-39	40-44	Unstandardized	Standardized for Age
Rural									
1969	LS1	0.4	4.2	10.9	16.2	14.0	10.0	10.9	10.5
1972	LS2	5.0	18.3	25.0	27.4	31.9	15.7	22.8	22.8
1975	SOFT	16.7	28.5	39.9	42.4	40.3	27.6	34.8	34.9
1978-79	CPS	30.0	44.6	53.5	58.4	59.4	45.8	51.3	51.2
1979	NS	20.0	32.4	51.5	61.3	57.0	40.4	47.5	47.2
1979	AFPH[a]	20.8	33.5	49.1	59.6	56.4	45.4	47.1	47.2
1981	CPS2	27.1	46.1	60.8	67.0	66.9	53.7	57.7	57.0
Urban									
1970	LS1	(12.0)	18.9	29.7	43.6	37.2	30.2	32.6	30.9
1973	LS2	(15.6)	29.6	45.6	51.0	53.3	46.3	45.1	43.2
1975	SOFT	(32.6)	46.8	47.2	54.3	54.8	48.9	49.4	49.2
1978-79	CPS[b]	(38.1)	42.7	58.5	73.3	77.8	69.8	62.8	62.5
1979	NS	--	(35.9)	58.3	60.0	69.8	60.6	57.6	53.9
1979	AFPH[a]	(27.3)	45.8	53.1	74.1	72.6	62.6	59.3	59.3
1981	CPS2	(41.7)	55.0	58.9	71.0	76.2	70.3	65.2	64.3
National									
1969-70	LS1	3.8	6.9	14.4	22.0	18.0	13.1	14.8	14.4
1972-73	LS2	6.0	20.1	28.6	31.4	35.6	19.4	26.3	26.0
1975	SOFT	18.1	30.9	41.0	44.0	42.3	30.5	36.7	36.8
1978-79	CPS[c]	31.3	44.2	54.4	61.1	62.8	49.5	53.4	53.1
1979	NS	19.5	32.9	52.7	61.1	59.5	44.2	49.3	48.5
1979	AFPH[a]	21.4	34.5	49.6	60.9	57.5	47.1	48.1	48.2
1981	CPS2	29.0	47.5	60.4	67.7	68.6	56.4	59.0	58.2

Notes: The age distribution of currently married women in the whole country as reported in the 1970 census was used as the basis of the age standardization. Results based on at least 10 but fewer than 50 cases are shown in parentheses; results based on fewer than 10 cases are not shown.

[a]Results refer to a universe of 20 provinces; the urban sample refers to provincial urban only.
[b]Bangkok metropolitan area.
[c]Excluding provincial urban.

Sources: Debavalya and Knodel (1978); Debavalya (1981); Kamnuansilpa and Chamratrithirong (1982); and unpublished tabulations.

close to 60 percent in the 12 years covered by the surveys.[1] While there is some difference in the prevalence rates indicated by the three surveys taken within less than a year of each other, between the end of 1978 and 1979, they all show markedly higher prevalence rates than previous surveys and lower rates than the 1981 survey. Presumably there has been a steady rise in contraceptive prevalence over the period covered and the differences among the 1979 surveys reflect sampling fluctuation and differences in the answers to which they refer. Moreover, the increase is greater among rural women, of whom only 10 percent were practicing contraception in 1969. As a result, rural-urban differences in contraceptive prevalence have narrowed substantially. Even the low prevalence rate for rural women in 1969 (10 percent) may be the result of a recent prior increase, given that the 1964 survey in the Potharam district found only 4 percent of married women aged 20-44 were currently practicing contraception and only 5 percent had ever practiced contraception (calculated from Hawley and Prachuabmoh, 1971a). Likewise Lauro (1979), in his study of a central Thai village, found prevalence increasing from the mid-1960s.

The increase in contraceptive prevalence has clearly occurred at all age groups. On the national level, in almost all the surveys, the highest rate is found among women in the 30-34 group, although rates in the 35-39 group are usually very close. For women in their early forties, however, the percentage currently practicing contraception is noticeably lower, undoubtedly reflecting in large part a recognition of reduced risk of pregnancy as they approach the end of their childbearing years. The lowest rates are consistently indicated for the youngest age group of married women, who presumably have the least incentive to limit their fertility since they are just beginning their childbearing and typically average less than one child ever born (Debavalya, 1981).

While women can discontinue contraceptive use as they become older and perceive that they are no longer risking pregnancy, the percentage of a cohort that has ever used contraception should increase with age up to the point when the last woman in the cohort who eventually adopts contraception does so. To gain an impression of the increase of contraceptive usage with age for a particular cohort, one can examine the proportions ever practicing contraception for successive age groups in the three surveys included in Table 35.

TABLE 35 Percent Who Ever Used Contraception Among Currently Married Women Aged 15-49, by Age and Residence: Thailand

	Rural			Urban			National		
Age Group	LS1 1969	SOFT 1975	NS 1979	LS1 1970	SOFT 1975	NS 1979	LS1 1969/70	SOFT 1975	NS 1969
15-19	3.8	25.9	30.0	(14.0)	(51.1)	--	5.0	28.3	28.6
20-24	5.6	40.8	42.7	26.4	64.3	(48.7)	9.4	43.9	43.7
25-29	14.3	56.1	62.1	39.6	66.9	70.0	19.1	57.7	63.6
30-34	21.2	57.4	73.8	50.9	71.5	78.3	27.4	59.2	74.7
35-39	16.3	55.7	65.4	44.7	68.5	84.1	21.2	57.4	69.0
40-44	15.0	51.1	55.7	33.3	60.4	74.2	17.8	43.7	59.2
45-49	[a]	24.8	31.5	24.2	44.8	(69.8)	--	27.6	37.4
Age standardized									
15-44	13.9	49.1	58.4	37.7	64.9	67.0	18.3	51.3	60.1

Notes: The age distribution of currently married women in the whole country as reported in the 1970 census was used as the basis of the age standardization. Results based on at least 10 but fewer than 50 cases are shown in parentheses; results based on fewer than 10 cases are not shown.

[a]In the rural phase of LS1, only women under age 45 were asked about contraceptive use.

Several caveats are appropriate with regard to the data in Table 35. Since the table refers only to currently married women, the data at younger ages refer only to those women in a cohort who marry early and who may be unrepresentative of the cohort as a whole as it ages and additional women in the cohort marry. Presumably few of the women who had not yet married were practicing contraception (see, e.g., Yoddumnern, 1981), but we have no way of knowing what proportions would have had they already been married. (The problem in interpretation is similar to the one discussed in Chapter 2 in connection with the total expected number of children in Table 13). In addition, the times between the surveys are not exact multiples of five years in every case, further detracting from the precise identity of particular cohorts over time when age is tabulated in five-year age groups as is the case in Table 35. However, since the time period between the surveys never deviates by more than one year from a five-year interval, we can at least approximate the experience of a particular cohort over time by comparing successive age groups across the three points in time.

The comparison clearly indicates that the proportion who had ever practiced contraception within individual cohorts increased sharply as the cohort became older. For example, the proportion of the cohort of rural women aged 20-24 in 1969 that ever practiced contraception increases from 6 percent in 1969, to 56 percent in 1975, and to 74 percent by the time they are aged 30-34 in 1979. Sharp increases are indicated for most cohorts, although several inconsistencies are apparent. The most glaring appears among rural women who were aged 40-44 in 1975: the proportion reporting ever using contraception was 41 percent in 1975, whereas four years later the 45-49-year age group reported only 32 percent ever used. Such inconsistencies are rare, however, and may arise from either reporting or sampling error. The generally sharp increase in ever use with age for cohorts is in contrast to the impression gained by comparing successive age groups in the cross-sections provided by any one of the particular surveys. In this period of rapid change, the cross sections are clearly inadequate for estimating cohort experience.

The specific methods of contraception being used by respondents are indicated in Table 36 and Figure 5 (after standardization for age). With the exception of LS1, which shows female sterilization as the most popular technique, all subsequent surveys at the national level

TABLE 36 Percent Currently Practicing Specific Methods of Contraception, Among Currently Married Women Aged 15-44, Standardized for Age, Classified by Residence: Thailand

Residence and Year of Survey	Survey	Pill	IUD	Sterilization		Injection	Condom	Others	All Methods
				Male	Female				
Rural									
1969	LS1	2.7	2.1	1.9	2.9	0.4	0.0	0.5	10.5
1972	LS2	9.7	4.6	2.7	4.5	0.8	0.0	0.2	22.8
1975	SOFT	14.3	6.8	2.2	6.6	2.1	0.3	2.7	34.9
1978/79	CPS1	23.1	3.7	3.5	10.4	4.9	1.5	4.1	51.2
1969	NS	21.4	1.9	4.2	12.4	6.1	10.6	0.7	47.2
1979	AFPH[a]	17.9	4.9	5.4	11.0	5.8	1.0	1.0	47.2
1981	CPS2	20.4	4.4	4.2	17.0	7.6	1.2	2.3	57.0
Urban									
1970	LS1	8.9	2.2	2.9	14.9	0.5	0.3	1.4	30.9
1973	LS2	16.6	5.0	3.5	16.5	1.2	0.6	1.9	43.2
1975	SOFT	20.3	5.0	2.3	13.6	2.1	1.6	4.3	49.2
1978/79	CPS1[b]	16.4	5.5	3.3	24.6	3.5	5.3	4.0	62.5
1979	NS	16.7	4.2	2.3	24.8	2.7	1.0	2.3	53.9
1979	AFPH[a]	15.6	3.2	2.6	28.2	4.7	3.0	1.9	59.3
1979	NS	16.7	4.2	2.3	24.8	2.7	1.0	2.3	53.9
1981	CPS2	19.5	2.6	3.8	24.9	4.1	5.1	4.3	64.3
National									
1969/70	LS1	3.8	2.1	2.0	5.1	0.4	0.1	0.7	14.4
1972/73	LS2	10.8	4.7	2.8	6.4	0.9	0.1	0.5	26.0
1975	SOFT	15.1	6.6	2.2	7.5	2.0	0.5	2.9	36.8
1978/79	CPS1[c]	22.0	4.0	3.4	12.9	4.6	2.2	4.0	53.1
1979	NS	20.6	2.1	3.9	14.8	5.4	0.7	1.0	48.5
1979	AFPH[a]	17.7	4.8	5.2	12.5	5.7	1.2	1.0	48.2
1981	CPS2	20.1	4.1	4.1	18.4	6.9	1.9	2.7	58.2

Notes: The age distribution of currently married women in the whole country as reported in the 1970 census was used as the basis of the age standardization. Rounding errors, minor coding discrepancies, and users of unspecified methods account for the small differences between the sum of the percentages practicing individual methods and the percentage for all methods.

[a]Results refer to a universe of 20 provinces; the urban sample refers to provincial urban only.
[b]Bangkok metropolitan area.
[c]Excluding provincial urban.

find the contraceptive pill the most commonly used method. Recent sharp increases in female sterilization, however, make it a close second by 1981. A distinct rural-urban difference also exists. All four of the most recent surveys find that in urban areas the pill is second to female sterilization, as it was at the time of LSI as well. Indeed, in 1981 approximately one out of every four urban, currently married women in the reproductive ages reported having been sterilized. The higher rates of sterilization in urban areas undoubtedly reflect the greater accessibility there to medical facilities

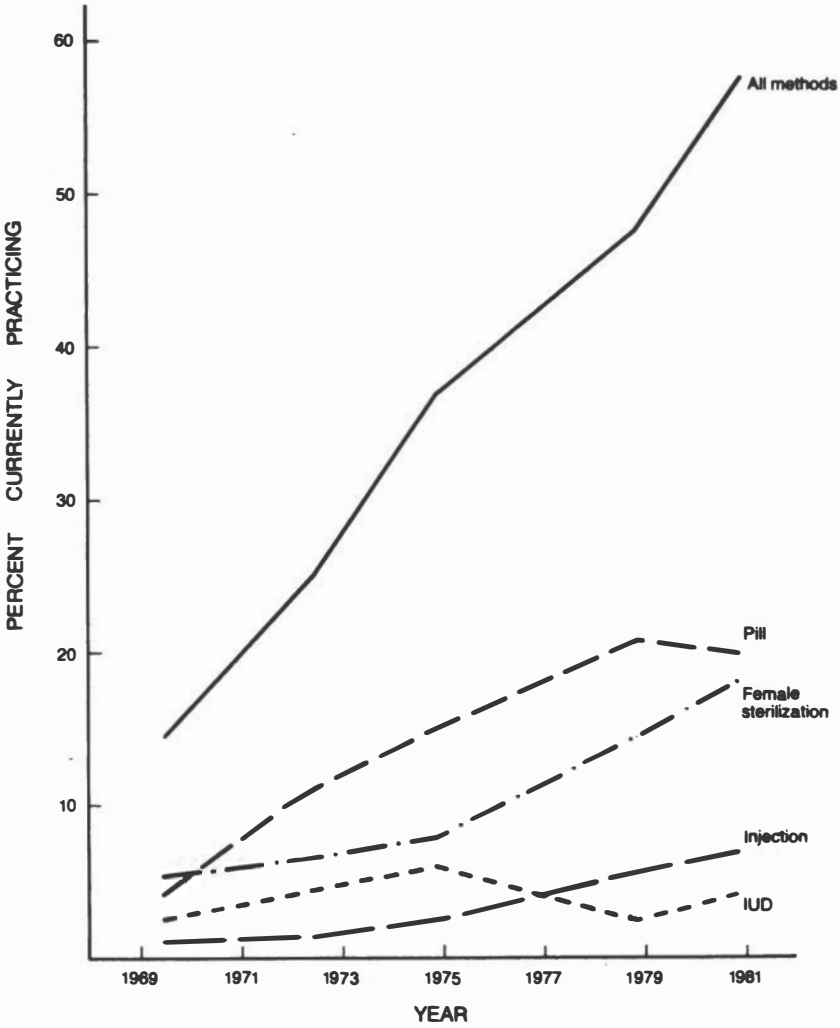


FIGURE 5 Percent Currently Practicing Specified Methods of Contraception from Surveys, 1969-70 to 1981: Thailand

Sources: 1969-70 LS1; 1972-73 LS2; 1975 SOFT; 1979 NS.

providing sterilization services. Even among rural women, however, the proportion sterilized is substantial and is approaching one out of every five currently married women, according to the most recent surveys.

THE CONTRIBUTION OF THE NATIONAL FAMILY PLANNING PROGRAM

The coincident timing of the development of an active national family planning program and the increase in contraceptive use suggests there is a connection between the two. Although the program was officially established in 1970, training activities began in early 1968 and by the time the national policy was declared in 1970, personnel had been trained in almost all provinces and the program was operating to some extent in most rural areas by or shortly after that time. Moreover, family planning was available through government hospitals in urban areas even earlier (Bennett et al., 1982). Since substantial proportions of urban women reported themselves as already using contraception in 1970 before the official program was launched, many were undoubtedly availing themselves of both the family planning services provided by these hospitals and commercially available contraception. Surveys indicate that the situation was quite different in rural areas. Only very minimal usage of contraception appears to pre-date the onset of the national program.

The particular mix of methods as well as the trends in different methods are undoubtedly associated with developments in the National Family Planning Program. For example, the popularity of the pill in rural areas is no doubt related to its wide availability, especially through outlets of the Ministry of Public Health, and coincides with the fact that during the last decade the majority of new acceptors reported by the National Family Planning Program chose the pill. In addition, the high rates of female sterilization are probably related to the increasing emphasis this method is being given in the national program, especially in the last few years (Joint Thai/U.S. Evaluation Team, 1979; Bennett et al., 1982).

The number of family planning acceptors officially attributed to the program (which includes most acceptors to affiliated private programs) has grown almost steadily since its inception, increasing from an average of about 60,000 new acceptors per year during 1965-68 to over 1 million by 1979. As Table 37 indicates, the largest

TABLE 37 New Acceptors in the National Family Planning Program: Thailand

Year	Total[a]	Pill	IUD	Injectable Hormonal	Female Sterilizations	Vasectomy
1965–68	186,893	17,861	125,458	--	47,574	
1969	130,219	60,459	54,496	--	15,264	
1970	225,439	132,387	74,404	--	18,648	
1971	404,187	294,607	86,304	--	23,546	
1972	456,694	327,582	90,128	6,316[b]	32,668	
1973	422,176	268,674	93,449	10,447[b]	49,606	
1974	494,479	305,244	89,739	19,014[b]	73,702	6,780
1975	535,023	345,117	75,163	24,559[b]	82,650	7,534
1976	627,239	376,707	71,894	73,357	95,131	10,150
1977	758,212	488,765	74,794	68,714	106,816	19,123
1978	890,713	557,857	77,775	86,620	124,205	44,256
1979	984,590	614,525	78,082	117,451	138,732	35,300
1980	1,065,518	653,610	79,378	149,744	151,681	31,105

-- indicates information not available.

[a]Includes only methods listed here, except for the years 1972–75.
[b]Totals include acceptors of methods not listed here such as condoms and foam.

Source: Mimeographed material from Thailand, Ministry of Public Health, and personal communications.

share of acceptors is attributed to the pill, which accounts for more than half of all acceptors for each year shown.

The program's success in reaching a large number of acceptors is undoubtedly due to a variety of factors. Of particular importance from the point of view of the program's structure has been the involvement of health personnel at all levels in family planning activities and especially the delegation of family planning tasks to paramedical personnel. In 1970, a decision was made to allow auxiliary midwives and nurses to provide the contraceptive pill, thus expanding enormously the number of personnel and service outlets for pill distribution. Another factor that apparently boosted pill use and ultimately the number of contraceptive users was the decision in 1976 to provide the pill free of charge. After that, a marked and sustained increase in the number of pill acceptors occurred without a compensating decline in acceptors of other methods or in commercial sales (Joint Thai/U.S. Evaluation Team, 1979). The use of midwives and nurses along with the free-pill policy undoubtedly contributed to the widespread use of the pill in Thailand.

Sample surveys such as CPS1, AFPH, and CPS2 are especially useful in assessing the extent of the government's contraceptive services independent of the government's official program statistics. Table 38 indicates the source of contraception reported by ever-married women in the reproductive ages who were currently using contraception at the time of each survey. As all three surveys clearly show, the large majority of users indicate a government source as the provider of their method of contraception. In both CPS1 and CPS2, more than three out of four women indicated they obtained their method from a government outlet. Nevertheless, the private sector, particularly drug stores, are a fairly significant source of contraception, accounting for between one fourth and one fifth of users nationally. As might be expected, given the more extensive commercial network and concentration of private clinics in urban areas, the importance of the private sector is greater for urban than for rural women. Among rural women, about four out of five rely on the government for provision of family planning services while only two thirds of urban women do.

A recent study attempted to assess the impact of the national program on fertility by estimating the number of births averted through use of program-supplied contraception (Khoo, 1979). A range of estimates is provided that depends on the particular combination of fertility schedules and continuation rates input into the computer model used for the calculations. The results suggest that a reasonable estimate of the national program's effect on births averted would account for close to 80 percent of the decline in the total fertility rate between 1964 and 1975, assuming no substitution of program methods for nonprogram methods. Allowance for substitution would, of course, reduce the estimated impact of the program. Unfortunately, it is not possible to estimate with any certainty how much substitution occurred. At the same time, however, the computer model used for the estimation ignores the possibility that new acceptors may be self-selected for higher-than-average fertility and that some nonprogram birth control might be stimulated by the program.

FAMILY LIMITATION AND BIRTH SPACING

There is evidence accumulating from both historical studies of Europe and contemporary experience in the

TABLE 38 Percent Ever-Married Women Aged 15-49 Currently Using Contraception, by Source and Residence: Thailand

Source of Contraception	AFPH 1969 Rural	AFPH 1969 Provincial Urban	CPS1 1978-79	CPS2 1981 National	CPS2 1981 Rural	CPS2 1981 Urban
Government	78.9	62.9	76.9	78.4	81.2	66.7
Private	21.1	37.1	23.1	21.6	18.8	33.3
Drugstore	10.6	19.0	11.3	12.0	10.0	20.4
Clinic/Hospital	8.6	16.6	6.3	7.6	7.0	9.9
Other	1.8	1.5	5.5	2.0	1.8	3.0
Total	100	100	100	100	100	100
N	1,418	542	(1,349)	(3,633)	(2,927)	(706)

Notes: Results refer to all current users, including a small number not currently married. CPS1 excludes the provincial urban population.

Sources: Kamnuansilpa et al. (1982), and unpublished tabulations.

developing world that the introduction and spread of birth control for limiting family size rather than increasing child spacing is a key feature in the initial stages of the fertility transition (Knodel, 1979, 1981; Siddiqui, 1979; for a dissenting view, see Friedlander et al., 1980). Thus we would expect couples who already have all the children they want to be the most receptive to adopting birth control as it spreads through the population. In his study of a central Thai village, Lauro (1979:243) reports: "Villagers were unanimous in expressing that their objective in practicing family planning was to curtail fertility rather than to space children or defer childbearing to a later time." He indicates that his finding was confirmed through in-depth qualitative investigation.

As the results in Table 39 clearly show, the percentage practicing birth control is substantially higher among couples who indicate that they want no more children than among those who still wish to have additional children. As would be expected, the increase in contraceptive prevalence has been more pronounced among the former group, with almost seven out of ten practicing contraception in 1981 among couples in which the wife is under age 45 and indicates she wishes to stop having children. Indeed, among the urban population more than three fourths of couples in this situation indicate they are currently practicing some form of contraception. Nevertheless, the practice of contraception for spacing births is also becoming more common, as indicated by the increase in contraceptive prevalence among couples in which the wife indicates she wants additional children. The most recent survey, CPS2, indicates that four out of ten couples who still want additional children are practicing birth control for spacing purposes.

A direct question on whether contraception was being practiced to space children or to terminate childbearing was asked current users in the Northeast Survey (NES) taken in 1980. The results indicate that 70 percent said their use was to stop childbearing altogether, 26 percent said they were spacing, and the remainder indicated they were unsure.

An initial dominance by the motivation to limit family size and the subsequent increasing importance of the spacing motivation over the course of the fertility decline is also evident in data collected from new acceptors to the National Family Planning Program. As indicated in Table 40, when the expanded National Program

TABLE 39 Percent Currently Practicing Contraception Among Currently Married Women Aged 15-44, by Residence and Desire for Additional Children: Thailand

Residence and Year of Survey	Survey	Desire for Additional Children: Want More	Want No More	Not Sure
Rural				
1969	LS1	1.2	16.7	--
1972	LS2	9.7	30.7	(16.7)
1975	SOFT	22.4	41.0	34.8
1978-79	CPS1	37.5	58.3	(46.5)
1979	NS	24.8	62.6	--
1979	AFPH[a]	26.8	59.1	--
1981	CPS2	40.3	67.5	50.6
Urban				
1970	LS1	17.1	46.4	16.0
1973	LS2	19.7	62.6	45.6
1975	SOFT	35.7	59.1	(29.1)
1978-79	CPS1[b]	43.0	74.5	--
1979	NS	26.6	76.9	--
1979	AFPH[a]	36.5	73.4	--
1981	CPS2	45.3	77.1	(23.5)
National				
1969-70	LS1	4.5	21.3	(8.7)
1972-73	LS2	11.4	35.0	(30.7)
1975	SOFT	24.6	43.1	33.0
1978-79	CPS1[c]	38.6	61.1	46.0
1979	NS	25.1	65.2	--
1979	AFPH[a]	29.2	62.7	--
1981	CPS2	41.2	69.2	46.0

Notes: Results based on at least 10 but fewer than 50 cases after weighting are shown in parentheses; results based on fewer than 10 cases are not shown.

[a]Results refer to a universe of 20 provinces; the urban sample refers to provincial urban only.
[b]Bangkok metropolitan area.
[c]Excluding provincial urban.

TABLE 40 Percentage Distribution of New Acceptors in the National Family Planning Program by Desire for Additional Children: Thailand

Year of Survey	Want More	Want no More	Unsure
1971-72	13.6	67.6	18.8
1973	19.5	61.6	19.0
1974	21.3	59.8	18.9
1975	22.6	57.9	19.5
1976	23.1	56.0	20.9
1977	25.9	55.4	18.7
1978	28.5	52.6	18.9
1979	28.4	53.5	18.2
1980	29.7	51.7	18.6

Source: Unpublished material from Thailand, Ministry of Public Health, and personal communications.

began in the early 1970s, more than two thirds of new acceptors indicated they wanted no more children. However, this share of acceptors has declined almost without exception in each subsequent year, so that by 1980 only slightly more than half of new acceptors indicate that they are ready to terminate childbearing altogether. At the same time, the share of new acceptors who indicate that they still want additional children has increased almost without interruption, so that close to 30 percent of new acceptors by 1980 are apparently adopting family planning from the National Program explicitly for spacing purposes. The proportion of acceptors who were unsure about their future fertility plans has remained remarkably steady throughout the decade at slightly less than one fifth of all acceptors.

Thailand seems to be rapidly approaching a situation where deliberate fertility control within marriage will be exercized widely for both spacing and stopping births. Even during the very short time that the fertility transition has been underway in Thailand, one can see the same evolution in contraceptive practice patterns with respect to spacing and stopping that probably occurred over a much longer period in the past for developed countries. This suggests that the demand for family planning services for spacing purposes will

probably contribute significantly to the overall demand in the future.

ABORTION

While the various surveys clearly document both the general increase in contraceptive practice and the methods of contraception used, they are less helpful for determining the amount of induced abortion in Thailand. Because abortion is illegal under most circumstances and, unlike contraception, is believed by many to be contrary to the principles of Buddhism, responses to direct survey questions on the use of abortion are generally assumed to seriously understate its prevalence.

In response to a direct question, only 3 percent of ever-married women under age 50 acknowledged ever having resorted to abortion as a means of birth control in CPS1 and only 2 percent did so in CPS2 (Kamnuansilpa and Chamratrithirong, 1982). In the FPHH study, which interviewed approximately 8,000 married women in the reproductive ages in the northeast region, only 1.5 percent admitted to ever having had an induced abortion (Porapakkham and Bennett, 1978:89). In the northern Thai fertility study, interviews with almost 2,000 women in two northern Thai provinces revealed reported rates of 2.4 percent in Chiang Mai province and 0.7 percent in Chiang Rai province (Shevasunt and Hogan, 1979:35). It is virtually certain that responses to direct questions in the surveys grossly underestimate the prevalence of induced abortion. It is interesting that Riley (1972:218) indicates that despite the fact that there was an abortionist in the village he studied and that he knew of specific instances of induced abortion, only one woman admitted to having had an induced abortion in the course of the systematic interviews he conducted to collect fertility histories.

Results from a number of sources other than direct survey questions suggest that the prevalence of induced abortion may be substantial in Thailand. A 1978 study of abortion practitioners in rural Thailand (Research and Evaluation Unit, National Family Planning Program, 1979) indicates that abortion is widely practiced, using methods ranging from very primitive to modern. Of these methods, massage abortion appears to be the most common. The study estimated that there are a minimum of around 300,000 illegal abortions per year in rural and provincial urban

Thailand. This would correspond to approximately one abortion for every four live births or an abortion rate of approximately 37 per 1,000 women, excluding the Bangkok population, which was not covered in this particular study. A 1980 study in an overwhelmingly rural northeastern province, again based on interviews with indigenous practitioners, indicated a considerably higher incidence of abortion: over eight abortions for every ten live births and an abortion rate of 107 per 1,000 women aged 14-44 (Narkavonnakit and Bennett, 1981).

An earlier attempt to estimate the national annual abortion rate, based on country-wide hospital admissions for incomplete abortions, indicated a total of 200,000 to 230,000 cases of induced abortion per year during 1972-73, corresponding roughly to an induced abortion rate of 28 per 1,000 women aged 15-45 (Cook and Leoprapai, 1974, cited in Baker and Clinton, 1981). The estimate is based on a series of assumptions that can be called into question. For example, they assume that all reported hospital admissions for incomplete abortions represent incomplete induced abortions. This is almost certainly not true and would bias their estimate upward. On the other hand, they assumed that hospital admissions represent approximately 10 percent of all induced abortions which may be too high and thus bias their estimate downward. For example, Narkavonnakit and Bennett estimate that in the northeastern province they studied only about 2.4 percent of induced abortions resulted in hospital admissions. Although firm estimates of the extent of induced abortion are not available for Thailand, and existing estimates can be called into question on the basis of representativeness and accuracy, it seems fairly clear that induced abortion is substantial in Thailand and should not be ignored as a factor influencing recent levels of fertility. In this connection, it is worth noting that a variety of studies make it clear that substantial numbers of abortions, perhaps the large majority, are attributable to married women, especially in rural areas and thus have potentially important influence on the level of marital fertility (see Baker and Clinton, 1981).

Limited evidence suggests that the overall prevalence of abortion has increased substantially during the same period that contraceptive practice has risen sharply. An extensive study based on a large number of hospitals throughout the country indicates a three-fold increase between 1966 and 1974 in the number of cases admitted for

complications associated with abortion. Although information specifying whether the complications resulted from induced or spontaneous abortion was not available, the author reports that many cases were probably the result of illegally induced abortions (Rauyajin, 1979). Another study based on admissions for induced abortion to a Bangkok hospital, indicates a steady 3.6-fold increase between the first three years, 1968-70, and 1977, followed by a slight decline during the next two years (Koetsawang, 1980; Baker and Clinton, 1981). These studies clearly suggest a major trend toward increased abortion at the same time contraceptive use is rapidly increasing.

At this stage in Thailand's fertility transition, it appears that both abortion and contraceptive use are part of the same process whereby family limitation is spreading rapidly throughout the population. As the fertility transition advances and contraceptive use becomes virtually universal and more efficient, and especially if the prevalence of sterilization continues to increase, the number of abortions in Thailand should decline. Perhaps the results from the Bangkok hospital study showing a decline since 1977 are beginning to signal such a change. A pattern of initial increase in abortions followed by a decrease may be a relatively common feature of fertility transitions in a number of countries (see Population Crisis Committee, 1979).

INFANTICIDE AND ADOPTION

In the absence of or in addition to birth control within marriage, mechanisms that can effectively reduce family size include infanticide, child abandonment, and transferring children out to live with others who are willing to care for them. While such factors cannot be thought of as proximate fertility variables, they can have the effect of limiting family size. We are unaware of any studies directed at examining the existence of deliberate infanticide, underinvestment in childcare (sometimes called infanticide by neglect), or child abandonment for Thailand with reference to either the past or present, although de Young (1955:49) states that "infanticide is so unthinkable by Thai Buddhist standards that anyone who committed it would be judged insane." Lauro (1979:106) notes that almost all villagers in the central Thai village he studied claimed to spend substantial sums of

money on medicines and treatment to keep their children well. However, Mougne (1978:83) does not rule out the possible infrequent practice of infanticide in the northern Thai village she studied and cites "pinching of the nose of the newborn" or deliberate neglect as the means. She concludes ". . . information regarding this is extremely difficult to obtain in Buddhist society, and it is unlikely to have ever been a major factor in traditional fertility limitation."

In contrast to the nearly unanimous views discounting infanticide, several observers have commented on transferring children through adoption as a way of coping with unwanted fertility under special or extreme circumstances. In his study of a central Thai village, Riley (1972: 228-229) indicates that 6 percent of first births tabulated in his study of pregnancy histories and pregnancy outcomes were reported as having been given to someone else to raise. Most cases involved young mothers whose babies were reared by other kin. Henderson (1971:68) states that ". . . families with large numbers of children may send one or more children to stay with relatives, neighbors, or in the case of boys, to the wat (Buddhist temple), where . . . they act as servants to the monks." They also state that "children are frequently adopted, especially by childless couples" (p. 71). Their description makes it clear that people are not referring to orphans but to children whose parents are still alive. In an article describing his own experience, being sent to live as a monk's apprentice at an early age, Sudham (1980:67) states that ". . . to give one of your children to be adopted by strangers for a sum of money or for free had been a common practice of peasants who have a large brood of youngsters, particularly in years of drought."

Data from the AMS provide a unique opportunity to evaluate the extent to which children lived separately from their biological parents and thus provide some idea of the extent of child transfer through adoption. In the course of collecting the life histories of respondents in the AMS, information was recorded indicating with whom the respondent lived at the time she was approximately ten years old. The data thus referred to the situation approximately a generation ago. Since information was also collected on when the parents died if they were no longer alive, it is possible to examine the percentage of respondents who were not living with either biological parent at age ten according to the survival status of the parents. As is evident from the results presented in

TABLE 41 Percent of Ever-Married Women Reporting Not Living with Either Biological Parent at Age 10, by Survival Status of Parents at Age 10: Thailand

Area	Survival Status of Parents at Age 10		
	Both Parents Alive	Mother Alive Father Dead	Father Alive Mother Dead
Bangkok General	4.3 (415)	5.3 (57)	28.6 (28)
Bangkok Slums	6.1 (425)	11.1 (45)	44.4 (27)
Semi-Rural	2.6 (568)	4.2 (48)	38.2 (34)

Source: Asian Marriage Survey.

Table 41, the respondents were more likely to report living with someone other than the biological parents if one of the parents had died, particularly the mother. Of greater interest are the results referring to the situation where both parents were still alive. In all three subsamples, a small percentage of respondents indicated that they did not live with parents even though both parents presumably were alive. The results suggest that this phenomenon was most prevalent among the Bangkok slum respondents, perhaps reflecting their poorer economic background during their childhood. These estimates are probably somewhat understated since we attempted to be conservative when judging from the data available whether a respondent's parents were alive at the time of her reaching age ten. Clearly, more direct evidence on this phenomenon would be required before any firm conclusions could be reached about its extent. It would be particularly interesting to examine whether the phenomenon of child transfer through adoption had been affected by the advent of widespread birth control.

NOTE

[1]Contraceptive prevalence as discussed in the present study includes use of all methods of contraception including "male" methods such as condoms or vasectomy. For the sake of convenience, however, prevalence is expressed as the percentage of women who are currently using or who have ever used some method, since the information on contraceptive use is typically elicited from women respondents.

CHAPTER 6

ESTIMATING THE IMPACT OF THE PROXIMATE DETERMINANTS ON FERTILITY

The observed fertility level of a population can be affected by variations in any of the intermediate variables as proposed by Davis and Blake (1956) or as reorganized and proposed as proximate determinants by Bongaarts (1978). However, Bongaarts (1980b) has demonstrated that only four proximate determinants--namely, the proportion married, contraception, induced abortion, and postpartum infecundability--are of any substantial importance in the analysis of fertility differences or trends, because variations in the population averages of the other factors usually are not large enough to make a substantial impact on fertility. He has proposed an analytical accounting scheme which enables us to assess the impact of each of these four principal proximate variables on the fertility level at any given point in time and to examine changes in their impact over time (Bongaarts, 1978). The fertility-inhibiting effect of each is assessed by comparing an estimate of the fertility level that would prevail in its presence and then in its absence. The potential fertility level that would prevail in the absence of the four principal proximate variables (i.e., under conditions in which all women in the reproductive ages were married and there was no breastfeeding, induced abortion, or contraception) is called the total fecundity rate. The level of total fecundity varies from population to population due to differences in the other proximate variables. Based on empirical analysis of a number of populations, Bongaarts has found that the total fecundity rate averages about 15.3 births per woman.

In the Bongaarts model, the impacts of the four principal intermediate fertility variables are measured by four indexes, each ranging from 0 to 1. When a given

intermediate variable has no fertility-inhibiting effect, the corresponding index equals one; if the fertility inhibition is complete, the index equals zero. The four indexes are defined as follows:

- C_m = index of proportion married (equals 1 in the absence of celebacy and 0 in the absence of marriage);
- C_c = index of contraception (equals 1 in the absence of contraception and 0 if all fecund women use 100 percent effective contraception);
- C_a = index of induced abortion (equals 1 in the absence of induced abortion and 0 if all pregnancies are aborted); and
- C_i = index of postpartum infecundability (equals 1 in the absence of lactation and postpartum abstinence and 0 if the duration of infecundability is infinite).

Since each index equals the proportionate reduction in fertility that it causes, the total fertility rate (TFR) is a product of the four indexes times the total fecundity rate (TF): $TFR = TF \times C_m \times C_a \times C_c \times C_i$.

The Bongaarts indexes can be estimated from a series of reproductive measures. In Table 42, measures and indexes required for the Bongaarts model are presented for four points in time corresponding to the one-year periods on which estimates of total fertility derived from LS1, LS2, SOFT, and NS were based. These four surveys were chosen because they were all conducted by or in collaboration with the same organization, the Institute of Population Studies at Chulalongkorn University, and thus should be relatively comparable. Details on the calculations of the reproductive measures are provided in the notes to the table. Each is based in some way on the data reviewed in the previous chapters.

It is worth stressing that several of these measures--in particular those referring to contraceptive effectiveness, induced abortion, and to a lesser extent lactational infecundability--require that a variety of assumptions be made in order to convert the observed data into measures. The utility of the Bongaarts model, however, does not depend on the availability of absolutely precise estimates of the required measures. As long as reasonable though rough estimates are possible, the model can be quite useful in providing the orders of magnitude for the extent to which the four principal proximate determinants inhibit

TABLE 42 Estimates of Selected Reproductive Measures and Derived Indexes of Four Proximate Determinants According to Bongaarts's Model: Thailand

	Year to Which Estimates Refer			
	1968	1971	1974	1978
Measure				
Total fertility rate (TRF)	6.12	5.30	4.52	3.38
Total marital fertility rate (TFMR)	9.23	8.07	7.03	5.49
Current contraceptive use (u)	.14	.26	.37	.49
Contraceptive effectiveness (e)	.95	.94	.92	.93
Total induced abortion rate (TA)	.41	.55	.69	.83
Lactational infecundability (i)	8.7	8.6	8.1	6.6
Model Indexes				
Index of proportions married C_m = TMFR/TFR	.66	.66	.64	.62
Index of contraception C_c = (1 - 1.08 ue)	.85	.74	.64	.51
Index of induced abortion C_a = TFR/(TFR + (.4 x (1+u) x TA))	.97	.95	.92	.88
Index of lactational infecundability C_i = 20/(18.5 + i)	.74	.74	.75	.82
Combined indexes $C_m \times C_c \times C_a \times C_i$	.40	.34	.28	.24

Notes: Where applicable, data for 1968, 1971, 1974, and 1978 are based on LS1, LS2, SOFT, and NS, respectively. TMF is calculated from Table 9 with estimated rates for the 15-19 age group, calculated as .75 times the rate of the 20-24 age group, substituted for the observed rates; u is based on age-standardized rates reported in Table 34. The estimates of e are derived from the distribution of methods presented in Table 36, applying an effectiveness rate of 1 for sterilization, .95 for IUD, .90 for pill and injection, and .70 for all others. These effectiveness rates were suggested by John Bongaarts (personal communication) and are adapted to data from the Philippines. TA for 1978 was based on a rate of 27.75 abortions to married women per 1,000 total women aged 15-44 derived by assuming that the national abortion rate for married women is three fourths the 37 per 1,000 women rate reported by Research and Evaluation Unit, National Family Planning Program (1979). The rate for 1968 was assessed to be half of this and to increase linearly to 27.75 by 1977. The mean number of months of lactational infecundability, estimated as 6.6 for 1978, was derived from the median value of 4.9 from CPS1 and the relationship between mean and median values of postpartum amenorrhea indicated in Lesthaeghe (1982:Figure II). Values for earlier years are proportional to the duration of breastfeeding based on the earlier surveys relative to the duration based on NS.

fertility, how their contributions change over time, and the contribution each makes to changes in fertility.

According to our calculations, marital structure alone reduces the total fecundity rate by a third or more during the decade under observation. The intercensal trends toward increasing proportions single and corresponding decreasing proportions of women currently married are reflected in the declining C_m index. Thus the proportions married were inhibiting potential fertility somewhat more by the end of the decade under observation than at the start. As would be expected, the index of contraception declined very substantially, reflecting the increasing importance of contraceptive practice in inhibiting potential fertility. Indeed, the change in this index is by far the greatest of any of those shown. While in 1968 proportions married had the largest inhibiting effect, as indicated by the fact that C_m has the lowest value of the four indexes, by 1974 contraception was of equal importance and by 1978 was of considerably greater importance. The index of induced abortion also declines, suggesting that abortion assumed an increasing importance in inhibiting potential fertility during the decade under observation, but this is a result of the largely arbitrary assumptions made about changes in induced abortion rather than being based on solid data. In contrast to the other three indexes, the index of lactational infecundability (C_i) increases in value, reflecting the decline in the duration of breastfeeding. Hence the importance of breastfeeding decreases as an inhibitor of potential fertility.

Given the straightforward multiplicative nature of Bongaarts's accounting scheme, it is a simple matter to estimate what fertility would be in the absence of any one or combination of the indexes. In addition to total fecundity (TF), which represents fertility in the absence of all four of the indexes, Table 43 presents three other measures of potential fertility: total marital fertility (TMF), which represents fertility if all women in the reproductive ages were married, i.e., in the absence of nonmarriage; total marital fertility in the absence of contraception but with abortion (TMFA); and total natural marital fertility (TNMF), which represents total marital fertility in the absence of both contraception and abortion. Total fecundity (TF) then represents total marital fertility in the absence of contraception, abortion, and breastfeeding. All four are easily

TABLE 43 Estimated Value of Selected Fertility Measures, Based on Bongaarts's Model, 1968-78: Thailand

Fertility Measures	Years to Which Estimates Refer			
	1968	1971	1974	1978
Total fertility rate (with breastfeeding, induced abortions, use of contraception, and nonmarriage)	6.12	5.30	4.52	3.38
Total marital fertility rate with breastfeeding, induced abortions, and contraception (TMF = TFR ÷ C_m)	9.23	8.07	7.03	5.49
Total marital fertility rate with breastfeeding, induced abortions (TMFA = TMF ÷ C_c)	10.82	10.96	11.05	10.74
Total natural marital fertility rate with breastfeeding (TNMF = TMFA ÷ C_a)	11.16	11.54	11.97	12.34
Total fecundity rate (TF = TNMF ÷ C_i)	15.18	15.63	15.92	15.43

estimated from the total fertility rate (TFR) and the other indexes as follows:

$$TMF = TFR \div C_m$$
$$TMFA = TMF \div C_c$$
$$TNMF = TMFA \div C_a$$
$$TF = TNMF \div C_i$$

Given the multiplicative relationship linking the measures of potential fertility, graphing them on a semi-logarithmic scale, as in Figure 6, is a convenient way to represent visually the relative importance of the fertility-inhibiting effect of each of the four principal proximate determinants responsible for the decline in total fertility during the decade under observation.

Bongaarts's accounting scheme also permits a decomposition of changes in total fertility into changes in the four principal proximate determinants separately, the remaining proximate determinants taken collectively, and an interaction factor (Bongaarts and Potter, forthcoming: Chapter 5). The decomposition of changes in total fertility between 1968 and 1978 is given in Table 44 and Figure 7. Results are expressed in terms of absolute change in total fertility, percent change, and the distribution of percent change. The results indicate that increases in contraceptive prevalence made a far greater contribution to the decline in total fertility then did any other variable, not only during the entire decade but also during each intersurvey interval. The

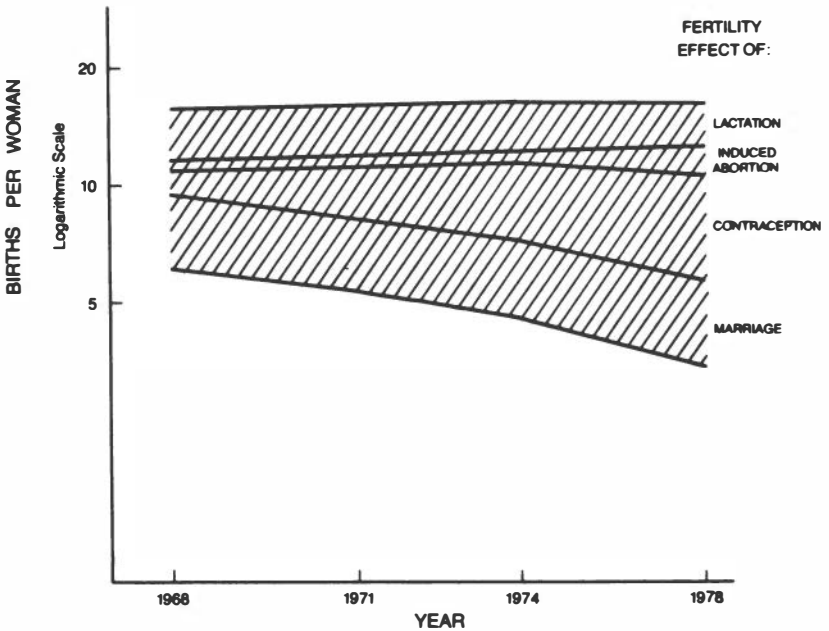


FIGURE 6 Changes in Selected Reproductive Measures Based on Bongaarts's Model, 1968-78: Thailand

Source: Table 43.

contributions to lower total fertility made by the assumed increase in abortion and the decrease in proportions married are of much smaller magnitudes. The results also indicate, however, that fertility would have increased during the decade by almost one fifth due to declining breastfeeding had the other variables remained constant. When the contribution of contraception and abortion are taken together, it is obvious that Thailand's reproductive revolution is largely the product of increasing deliberate marital fertility control with all other factors being of secondary importance.

TABLE 44 Decomposition of the Change in the Total Fertility Rate, Based on Bongaarts's Model, 1968-78: Thailand

Factors Responsible for Fertility Change	Absolute Change in TFR				Percent Change in TFR				Distribution of Change in TFR			
	1968 -71	1971 -74	1974 -78	1968 -78	1968 -71	1971 -74	1974 -78	1968 -78	1968 -71	1971 -74	1974 -78	1968 -78
Proportion of women married	-.06	-.11	-.19	-.43	-0.9	-2.1	-4.2	-7.1	-6.7	-14.3	-16.7	-15.8
Contraceptive practice	-.84	-.72	-.89	-2.45	-13.7	-13.6	-19.7	-40.1	-102.2	-92.5	-78.2	-89.5
Induced abortion	-.13	-.15	-.24	-.61	-2.1	-2.8	-5.4	-10.0	-15.7	-19.0	-21.4	-22.3
Postpartum infecundability	+.02	+.10	+.27	+.51	+0.4	+1.9	+6.0	+8.4	+3.0	+12.9	+23.8	+18.8
Other proximate determinants	+.18	+.10	-.14	+.10	+3.0	+1.9	-3.1	+1.6	+22.4	+12.9	-12.3	+3.6
Interaction	-.01	.00	+.05	+.15	-0.1	0.0	+1.2	+2.4	-0.7	0.0	+4.8	+5.4
Total	-.82	-.78	-1.14	-2.74	-13.4	-14.7	-25.2	-44.8	-100	-100	-100	-100

Note: Due to rounding, sum of individual factors may not add up to total.

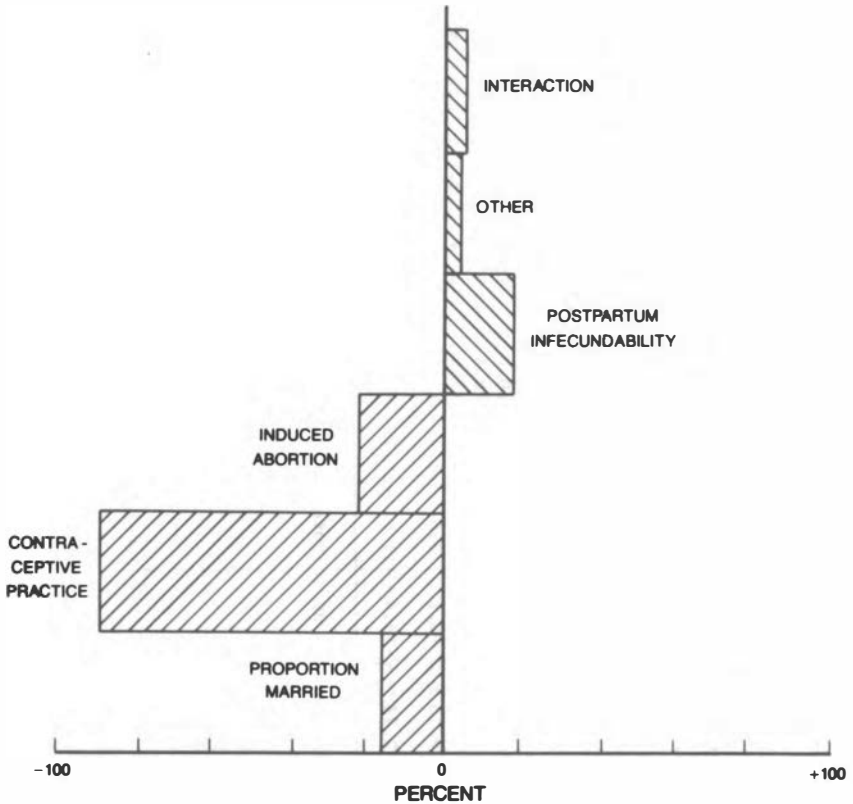


FIGURE 7 Decomposition of the Change in the Total Fertility Rate Based on Bongaarts's Model, 1968-78: Thailand

Source: Table 44.

CHAPTER 7

ATTITUDES TOWARD FAMILY SIZE, SEX COMPOSITION, AND FERTILITY CONTROL

Many of the studies reviewed in the previous chapters that provided behavioral data on fertility and birth control practices also attempted to explore preferences for family size and sex of children as well as attitudes toward fertility control with regard to both contraception and abortion. In this chapter we review the evidence from these studies and several others regarding desired family size, preferences for the sex composition of families, and attitudes toward birth control, including abortion. We do not include in this chapter, however, any extensive examination of the detailed attitudinal data that have been collected on the value and disvalue of children, available from the international Value of Children Study in which Thailand participated and to a lesser extent from the husband survey component of SOFT. Such a task is beyond the more limited scope of the present study as we have defined it.

DESIRED FAMILY SIZE

Attempts to measure family-size preferences in developing countries have been incorporated in so-called KAP surveys (meaning Knowledge of, Attitudes toward, and Practices of family planning) since their inception. While a variety of more sophisticated approaches have been developed to measure family-size preferences, undoubtedly the most common source of such information is a relatively simple question asking for the number of children the respondent would have if he or she could have just the number wanted. In cases where the respondents are married, the question often is phrased in terms of how many children the respondents would like to have if he or she were starting

marriage over again. A number of surveys in Thailand included such questions and provide the basis for testing both the level and trend in desired family size over the period of the recent fertility decline.

The meaningfulness of responses to questions on desired family size, particularly in developing countries, have often been questioned. Especially in settings where the practice of birth control is rare or absent, family size may not be thought of as a matter of conscious rational choice and thus questions on desired family size may make little sense to the respondent. In a recent study of birth expectations, Placek and Hendershot (1981) propose a conceptual framework which contrasts situations dominated by fate and those dominated by control. In the former, many couples may lack the knowledge of birth control, the planning orientation, or the social environment that leads to decision making about fertility, and children are viewed as the inevitable consequence of sexual activity. In contrast, the role of individual decision making becomes more salient as control over the environment and over one's "demographic fate" increases (Back, 1967). A similar argument can be made with regard to fertility preferences. Thus we might expect responses to desired family size questions to become increasingly meaningful with the spread of deliberate family limitation practices.

There is some evidence indicating that concern about limiting family size was not well entrenched in the thinking of much of the population at the onset but that it gained salience during the early stages of the recent fertility decline in Thailand. As part of the Rural Employment Survey in 1969, a sample of men with wives in the reproductive ages in northern Thailand were asked if they had ever discussed with their wives the number of children they wanted or the possibility of using birth control. Only 29 percent said they had ever discussed family size and only 17 percent had discussed the possible use of birth control (Jones and Rachapaetayakom, 1970). Similar questions were asked a sample of married men in the south a year later. Slightly more than a third had discussed family size and 17 percent had discussed birth control (Jones and Soonthornthum, 1971).

In LS1 and LS2 married women respondents were asked whether and how often they had discussed problems of having too many children with their husband, with relatives, or with friends or neighbors. Results are summarized in Table 45. Only a minority of women in LS1

TABLE 45 Percentage Discussing Problems of Excess Fertility Among Married Women in Reproductive Ages, Currently Living with Husband, by Residence: Thailand

	Rural		Urban	
Reference Person and Frequency	LS1 1969	LS2 1972	LS1 1970	LS2 1973
With Husband				
Very Often	8.6	7.3	6.5	10.7
Fairly Often	18.4	20.3	16.0	18.5
Once or Twice	10.9	12.9	23.2	21.2
Never	62.1	59.5	54.3	49.6
Total Percent	100	100	100	100
Total N	952	1,269	1,458	527
With Relatives				
Very Often	4.1	5.4	4.2	--
Fairly Often	15.2	21.6	15.1	--
Once or Twice	9.2	9.2[a]	16.0	--
Never	71.5	63.9	64.8	--
Total Percent	100	100	100	--
Total N	956	1,270	1,459	--
With Friends or Neighbors				
Very Often	4.8	7.7	8.6	--
Fairly Often	16.8	25.7	20.3	--
Once or Twice	10.7	12.8[a]	17.5	--
Never	67.8	53.8	53.7	--
Total Percent	100	100	100	--
Total N	947	1,270	1,455	--

Notes: Totals exclude a small number of respondents coded as don't know, no answer. Reproductive ages were defined as 15-44 in the rural phase of LS1 and 15-49 in all others.

[a]Including a small number of respondents for whom the frequency of discussion is unknown but who indicated that they have discussed problems of excess fertility.

indicated they had discussed this matter with any of the specified reference persons. However, both the proportion who ever discussed such matters as well as the frequency of those discussions apparently increased between the two rounds of the survey, although more than half of rural women still indicated never having had any discussions by the time of LS2. As might be expected, given the lower fertility levels and greater use of contraception among urban women at the time of the surveys, discussions of the problems of having too many

children were more common among urban than rural respondents. Interestingly, for the rural sample, for which such a comparison is possible, the greatest increase in discussions is indicated with friends or neighbors and the least increase with husbands. According to an analysis of the early experience of organized family planning activities in Thailand, such person-to-person communication among friends and acquaintances proved an effective way of recruiting sizable numbers of acceptors (Rosenfield et al., 1973).

Since many of the same respondents were included in LS1 and LS2, the possibility exists that the first round of the survey itself in which questions related to the desired family size and birth control may have stimulated the increased discussion. Results from WRPS, an entirely different survey, however, suggest a continuation of the trend toward heightened salience of fertility limitation concerns. Of the rural sample of women interviewed in 1975, three years after the rural round of LS2, only 47 percent said they had never discussed their desired number of children with their husband. Moreover, this proportion was lower among younger women than older women: 42 percent of women aged 15-29 never discussed this matter with their husbands compared to 52 percent of women aged 30-44 (Deemar Company, Ltd., 1975). Again, this suggests a trend over time toward increased concern about the question of family size.

Several studies have attempted to evaluate the meaningfulness and quality of responses to questions on desired family size in Thailand. One common difficulty with such data, for example, is that many respondents answer the question with vague responses referring to fate, "up to God," and so on, rather than providing a specific number. Based on data from LS1, Knodel and Prachuabmoh (1973) point out that the vast majority of currently married Thai women did provide numerical responses to a question on family-size preferences. (For data on men, see Prachuabmoh et al., 1972:69). The LS1 data show that desired family size increases with age, a relationship found in all Thai surveys as well as typically in surveys in other countries. This undoubtedly reflects to some extent a tendency for respondents to rationalize the number of children they have when stating the numbers they would want if they were recently married. Nevertheless, analysis of LS1 data reveals that the vast majority of respondents indicated a preferred number that was different from the number of living children they had at

the time of interview. Moreover, the large majority of women with five or more living children stated a preferred number that was lower than their actual number of children. These results from LS1 are of particular interest since they refer to a period of time when contraceptive prevalence was still relatively low.

Of course, simply providing a numerical answer to a question on desired family size does not necessarily indicate that the response is meaningful. The very nature of the survey approach may encourage respondents to give numerical responses even if they are not particularly inclined to do so. For example, interviewers might encourage respondents to whom the question made little sense to provide some answer anyway. The findings of Lauro (1979), based on his study of a central Thai village, are interesting in this connection. He posed an open-ended question to villagers about their childbearing preferences and consciously attempted not to encourage numerical responses if they did not come forth spontaneously. Only about a quarter of the villagers responded to the question with exact numbers. However, a number of others were able to state a narrow range or to express a preference in terms of "few" or "many". Altogether, approximately 5 percent were able to give precise numbers or some indication of preferred size. Of those who did not give such responses, about a third, mostly unmarried females, indicated they had never thought about it; another third responded that the number of children they already had was enough; and the remainder indicated they either did not understand the question, did not know, or gave an ambivalent response. His findings thus indicate that very few married respondents said they had never thought about the question, even though this was a permissible answer (as indicated by the substantial number of unmarried women who provided it). Lauro does not provide information about the marital status of those who indicated they did not understand the question, did not know their desired number of children, or were ambivalent. Quite possibly these include a fair number of unmarried respondents as well. Finally, the substantial proportion who responded that the number of children they had was enough suggests that they clearly had some idea of how many children they wanted even if the questioning did not elicit numerical responses. Thus Lauro's results support the idea that Thai villagers currently have conscious desires about family size even if such desires are not necessarily conceptualized as a

single number. It should be noted that contraceptive prevalence was already fairly substantial in the study village at the time of his field work and thus his findings do not tell us the extent to which villagers would have been able to articulate family-size preferences prior to the spread of birth control.

Based on a comparison of responses in LS1 and LS2 for respondents included in both surveys, Knodel and Piampiti (1977) calculated the reliability ratios for a number of variables, including desired family size. The reliability ratio is intended to indicate the proportion of respondents giving the same answer after allowing for the fact that there would be some agreement simply by chance. The results indicate fairly low levels of individual consistency. Nonrandom consistency ranged from 19 percent for rural women to 29 percent for urban male household heads. Even so, responses on desired family size showed greater consistency than most other attitudinal variables, although considerably lower consistency than for most behavioral variables. Moreover, among rural women, urban women, and urban household heads, the majority of respondents who stated different ideal family sizes in the two survey rounds deviated by only one child in either direction. Only among rural household heads was the average discrepancy greater than one child. Viewed in this way, the amount of inconsistency seems considerably more moderate; also, allowances should be made for genuine change, given the three-year interval between the two surveys.

In the AFPH survey, women were not only asked the standard question on desired family size but were also asked a hypothetical question on the number of children they would recommend a daughter to have. Presumably the latter question would be less affected by attempts to rationalize the respondent's own existing number of children. The results of these two questions are compared in Table 46 by age of respondent. While for both questions the mean number of preferred children increases with age, at every age the number stated for the daughter is lower than for the respondent herself. The fact that this difference increases substantially with age strongly suggests that at least part of the increase with age in preferred number of children for self is due to rationalization of the number of living children. Possibly, the change in the recommended number of children for daughters with age is also a product of rationalization, although it could also reflect a trend toward smaller desired family sizes over time.

TABLE 46 Preferred Number of Children for Self and for Daughter, by Age and Residence, Currently Married Women Aged 15-44, 1979: Thailand

	Rural			Urban			Total		
Age	For Self	For Daughter	Difference	For Self	For Daughter	Difference	For Self	For Daughter	Difference
15-19	2.60	2.52	.08	(2.30)	(2.45)	(.15)	2.58	2.52	.06
20-24	2.72	2.68	.04	2.64	2.52	.20	2.72	2.66	.06
25-29	2.99	2.75	.24	2.89	2.70	.29	2.99	2.75	.24
30-34	3.41	2.88	.53	2.99	2.73	.69	3.38	2.87	.51
35-39	3.59	3.00	.59	3.06	2.89	.70	3.56	2.99	.57
40-44	3.64	3.01	.63	3.44	2.94	.70	3.62	3.00	.62
Total									
Unstandardized	3.19	2.82	.37	2.94	2.72	.22	3.15	2.81	.34
Unstandardized for age	3.21	2.83	.38	2.94	2.73	.21	3.19	2.82	.37

Notes: The results refer to a sampling universe of 20 provinces; the urban sample refers to provincial urban only. The distribution of currently married women for the whole country as reported in the 1970 census was used as the basis for the age standardization. Results in parentheses are based on fewer than 50 cases.

Source: AFPH.

Trends in family-size preferences are indicated in Table 47, which shows the mean preferred number of children across successive surveys for both married women and their husbands. In addition, separate results are shown for married women under age 25, on the assumption that the responses of younger married women are less affected by rationalization since most are still at an early stage of family building. Moreover, responses from the younger women should reflect the most recent trends in family-size preferences and thus be more indicative of fertility developments in the near future as these women pass through their remaining childbearing years. However, some caution is warranted when examining results for the younger women, since those who married at younger ages may not be representative of all women who eventually marry by the end of the reproductive span.[1]

The mean preferred number of children declined substantially during the period under observation both for women aged 15-44 and for women under 25. In each survey, the mean preferred number of children is lower for the younger women, but the declines are quite parallel, so the difference of about half a child indicated at the time of LS1 is still evident more than a decade later. Likewise, in every survey the number of children preferred by husbands is consistently higher than for their wives, but it declines in a remarkably parallel fashion. Both rural men and women consistently expressed higher preferred numbers of children than their urban counterparts throughout the period. In the countryside as well as in towns, younger women since 1979 indicated they want fewer than three children on the average, suggesting that fertility rates in the future should continue to decrease.

The mean preferred number of children remained constant for rural women between 1969 and 1972 and declined by only one tenth of a child for rural husbands, despite the fact that contraceptive usage increased substantially and marital fertility declined during the same period. Moreover, desired family size among currently married women aged 20-44 in the Potharam district was 3.8 in 1964 and 4.0 in 1965, thus averaging 3.9 or exactly the same as the figure for rural women reported approximately five years later in LS1 (Hawley and Prachuabmoh, 1971a:77).

The Thai experience is roughly similar to that of Taiwan and Korea, where initial increases in contraceptive practice and decreases in fertility took place in the absence of any noticeable concomitant change in desired

TABLE 47 Preferred Number of Children Among Currently Married Women Aged 15-44, and Husbands of Currently Married Women Aged 15-44, Standardized by Age, and Among Currently Married Women Under 25, by Place of Residence: Thailand

	LS1 1969/70	LS2 1972/73	SOFT 1975	NS 1979	AFPB[a] 1979	CPS2 1981
Rural						
Women 15-44	3.9	3.9	3.7	3.3	3.2	3.0
Husbands	4.3	4.2	3.8	3.5	--	--
Women under 25	3.4	3.4	3.1	2.9	2.7	2.6
Urban						
Women 15-44	3.6	3.4	3.3	3.0	2.9	2.5
Husbands	3.8	3.6	3.5	3.2	--	--
Women under 25	3.0	2.9	2.9	2.8	2.6	2.2
Total						
Women 15-44	3.8	3.8	3.6	3.3	3.2	2.9
Husbands	4.2	4.1	3.8	3.4	--	--
Women under 25	3.3	3.3	3.0	2.8	2.7	2.5

Notes: The age distribution of currently married for the whole country as reported in the 1970 census was used as the basis of the age standardization. Results for husbands were standardized based on their wife's age.

[a]Results refer to a universe of 20 provinces; the urban sample is provincial urban only.

Sources: Knodel et al. (1980); Kamnuansilpa and Chamratrithirong (1982); and unpublished tabulations.

family size; only after these changes had gained some momentum was an accompanying decline in the preferred number of children observed (Freedman et al., 1974; Ross and Kap Suk Koh, 1977). In all three countries the stated preferred number of children was substantially below the number of living children women had by the end of their childbearing years.

The experience of these countries as well as Thailand suggests that fertility desires may respond to the spread of family planning practices rather than vice versa. One possible interpretation of such a lag in attitudinal change relative to behavioral change is that only after the concept of family planning becomes widely known and contraceptive practice reaches a moderate level is it realistic for couples to start adjusting their preferred number of children downward. In the Thai experience, this situation may have been reached before 1970 among

urban women, thus permitting a steady decrease in the mean preferred family size over the period under observation. In the rural areas, where contraceptive knowledge was much more limited and contraceptive practice minimal at the beginning of the period, a short time lag may have been required before fertility desires started to decline in response to an increasing awareness of the possibility of limiting family size.

The distribution of responses to the question on family-size preferences as reported in LS1 and in the three most recent surveys reveals that a substantial change occurred over the decade (see Table 48). At the time of LS1, the majority of both rural and urban currently married women in the reproductive ages reported a desired family size of four or more children for themselves. This has decreased substantially while the proportion who expressed a preference for two or three children increased considerably. By 1981, a substantial majority of women indicate two or three as the desired number. Presumably the effect of rationalization of existing number of children on desired family size is minimized in the data on preferred number of children by women under 25 as well as in the data on the number of children that women in all reproductive ages would recommend for a daughter. In these cases, a modal preference for two children is clearly apparent both for rural and urban women. All surveys point to a clear avoidance of preferences for zero or one child. In both of these respects, family-size preferences among Thai women resemble those expressed recently in the United States.

The modal preference for two children is supported by evidence from other sources as well. In all three AMS subsamples of currently married women--in Bangkok generally, in a Bangkok slum, and in a semi-rural area--two children was also the most frequently expressed preference. Lauro (1979) also found that two was the most frequently cited preferred number of children in response to the open-ended question he used in his central Thai village study. In his study of unmarried adolescents, Muangman (1979) indicates that two was clearly the dominant preferred number of children.[2] Two was not only the modal preference but was the number stated by the majority (57 percent) of those who expressed a preference.

Table 49 shows the average preferred number of children by age of respondent among currently married

TABLE 48 Percent Distribution of Preferred Number of Children for Self and for Daughter Among Currently Married Women Aged 15-44 (and under 25), by Place of Residence: Thailand

Residence and Preferred Number of Children	For Self, Women 15-44				For Self, Women Under 25			For Daughter, Women 15-44[a]
	LSI 1969/70	NS 1979	AFPH[b] 1979	CPS2 1981	LS1 1969/70	NS 1979	CPS2 1981	AFPH[b] 1979
Rural								
0-1	5.2	2.3	4.0	6.0	8.5	2.1	6.3	3.3
2	18.2	29.7	29.7	34.1	27.1	47.0	47.2	39.6
3	21.0	22.8	32.0	31.3	22.6	20.6	31.9	34.6
4+[c]	55.5	45.2	34.3	28.6	41.8	30.3	14.7	22.5
Total	100	100	100	100	100	100	100	100
Urban								
0-1	3.9	4.4	4.8	10.1	7.2	2.1	15.0	3.2
2	21.2	34.5	34.2	46.6	29.8	53.2	51.0	40.8
3	23.5	22.6	34.3	27.3	27.5	17.0	27.7	38.9
4+[c]	51.3	38.5	26.8	16.0	35.5	27.7	6.3	17.1
Total	100	100	100	100	100	100	100	100
Total								
0-1	5.0	2.7	4.1	6.7	8.2	2.1	7.6	3.4
2	18.7	30.5	29.9	36.3	27.6	47.9	47.8	39.7
3	21.5	22.8	32.2	30.6	23.5	20.1	31.2	34.9
4+[c]	54.8	44.0	33.8	26.4	40.7	29.9	13.4	21.9
Total	100	100	100	100	100	100	100	100

[a]Including a small number of women 45 or older.
[b]Refers to a universe of 20 provinces; urban refers to provincial urban only.
[c]Including "as many as possible."

Source: Results for the CPS2 in part from Kamnuansilpa et al. (1982).

TABLE 49 Preferred Number of Children by Age and Place of Residence, Currently Married Women, Aged 15-44: Thailand

Age Group	Rural LS1 1969	Rural SOFT 1975	Rural NS 1979	Urban LS1 1970	Urban SOFT 1975	Urban NS 1979
15-19	3.67	2.90	2.84	2.93	(2.67)	—
20-24	3.29	3.14	2.86	3.04	2.89	(2.87)
25-29	3.78	3.43	3.15	3.38	3.21	2.57
30-34	3.86	3.95	3.45	3.82	3.26	3.23
35-39	4.33	4.02	3.75	3.91	3.49	3.39
40-44	4.33	4.10	3.65	4.14	4.13	3.50
45-49	--	4.60	4.16	3.87	(4.35)	(3.61)

Notes: Results based on at least 10 but fewer than 50 cases shown in parentheses; results based on fewer than 10 cases not shown.

women for three national surveys spanning the last decade. For each survey the desired family size increases with age for both rural and urban women and undoubtedly reflects the increasing importance of rationalization as women's actual family size increases. A comparison of the same age group across the three surveys reveals a pervasive decline in the desired family size regardless of age. Moreover, the magnitude of the decline shows little association with age.

We can approximate the experience of specific cohorts as they aged over the decade by comparing successive age groups across three surveys. As discussed in connection with similar comparisons with respect to contraceptive prevalence and expected number of children, some caution is required when interpreting results in this manner. In particular, problems arise because of sample fluctuation, selection for early marrying members of one cohort for younger age groups, and deviations from five-year multiples in the interval between the surveys. Contrary to the impression given by the cross-sectional association between age and desired family size, there are only limited instances of increases with age for particular cohorts. Indeed, desired family size is as likely to decline as to increase between the two surveys for any particular set of successive age groups. Apparently the declining trend in fertility desires over the period was

sufficient to counteract the tendency for desired family size to increase with age as a result of rationalization. The sharp increases in contraceptive prevalence with age for the same cohort, as indicated in the previous chapter, undoubtedly resulted in lower increments in family size with age than in the past. This in itself would also reduce the extent to which rationalization would lead to an increase in desired family size with age for the cohort experience compared to the cross-sectional age pattern.

GENDER PREFERENCES

Anthropological studies make clear that children of both sexes are valued in Thailand although to some extent for different reasons. Only a son can serve time in the Buddhist monkhood, an action thought to bring considerable merit to his parents and a reason frequently cited as underlying the importance of having a son. On the other hand, in much of rural Thailand, couples typically reside with the wife's parents immediately following marriage, thus adding the labor of the son-in-law to that of the household. While such co-residence is often temporary, it is common for the youngest daughter in the family to live with her husband in the parental household permanently, to take care of her parents in their old age and eventually to inherit the house (Smith et al., 1968:120; de Young, 1966:23; Foster, 1975, 1978). Thus we might expect that many couples will feel it is important to have at least one child of each sex. In his study of a central Thai village, Riley (1972) points out that many women when asked about their ideal family size said they wanted two children and then volunteered the information "one boy and one girl." Although some anthropologists report son preference (e.g., Kingshill, 1960:187), more frequently they note that there is a lack of strong preference for sons (Hanks and Hanks, 1963; Blanchard, 1958:435). Occasionally, a preference for daughters is even suggested (Mougne, 1974, Part 3:19; Potter, 1976:127; Kemp, 1970:83).

In a comparative study of gender preference based on the Value of Children Study, Kuo (1980) judged the level of son preference to be intermediate in Thailand, below that characteristic of Korea or Taiwan but stronger than the Philippines or Indonesia. The data also confirm the impression of anthropologists that sons and daughters are valued to some extent for different reasons.

Statistical evidence on preferences for the sex composition of families has been examined in two studies based on LS1 and LS2 (Prachuabmoh et al., 1974; Knodel and Prachuabmoh, 1976). In this section we review some of the findings from these studies and update them with data from NS and, to a lesser extent, CPS2. In all but CPS2, both male household heads and married women were interviewed, thus permitting a comparison of gender preferences among men and women.

In the urban round of LS2 and NS, respondents were not only asked about their preferred number of children but also were asked how many children of each sex they would like to have if they could have just the number they wanted. Responses to these questions provide direct evidence on the preferred sex composition of the desired number of children. Analysis of these data must be limited to those respondents who were able to state not only a desired family size but to specify the number of sons and daughters they wanted. Fortunately, this includes the vast majority of respondents. Nevertheless, it should be recognized that some respondents who stated a desired family size but not a desired number of sons and daughters probably had no strong preferences regarding the sex of their children.

The percent distribution of desired number of sons and daughters is shown in Table 50 for currently married women in reproductive ages and for male household heads with wives in the reproductive ages. For both men and women in the sample and for both residence categories, the mean number of desired sons exceeds the mean number of desired daughters. The sex ratio of desired sons to desired daughters is substantially higher for men, however, than for women respondents, thus indicating a substantially stronger son preference among males. Similar results were also obtained in the Value of Children Study done in 1976: the sex ratio of desired children indicated by wives was 1.16 and by husbands was 1.39 (Kuo, 1980).

For both men and women in the NS sample, the ratio of desired sons to desired daughters is higher for the urban population, although the difference is much greater for males than for married women. This urban-rural difference undoubtedly results mainly from the substantial proportion of ethnic Chinese in the urban sample. Analysis of the urban round of LS2 indicates that the sex ratio of preferred children for ethnic Chinese women was 1.25 compared to 1.10 for ethnic Thai women and 1.50 for

TABLE 50 Percent Distribution of Desired Number of Sons, Desired Number of Daughters, and Ratio of Desired Number of Sons to Daughters, by Residence, Among Currently Married Women Aged 15-44: Thailand

	Urban				Rural	
	LS2 1973		NS 1979		NS 1979	
Desired Number	Sons	Daughters	Sons	Daughters	Sons	Daughters
Among Married Women						
0	3.0	5.3	2.1	6.0	1.7	2.4
1	34.3	41.8	43.4	50.2	39.4	46.8
2	47.6	44.9	43.8	38.1	45.4	40.6
3+	15.2	8.0	10.7	5.7	13.5	10.2
Total percent	100	100	100	100	100	100
Mean number	1.81	1.58	1.68	1.45	1.78	1.61
Sex ratio (m/f)	1.15		1.16		1.10	
Total N	1,248		281		1,315	
Among Male Household Heads						
0	1.7	7.1	0.7	11.5	0.5	4.9
1	20.4	44.9	28.1	44.6	32.0	44.9
2	51.3	39.0	51.1	41.0	46.1	39.3
3+	26.3	9.0	20.1	2.9	21.4	11.0
Total percent	100	100	100	100	100	100
Mean number	2.61	1.54	2.11	1.36	2.01	1.63
Sex ratio (m/f)	1.40		1.55		1.23	
Total N	879		139		844	

Note: Respondents not stating numerical responses to questions on the desired number of sons and daughters are excluded from the table.

Source: LS2 results from Knodel and Prachuabmoh (1976).

ethnic Chinese male household heads compared to 1.36 for ethnic Thai household heads (see Knodel and Prachuabmoh [1976] for a discussion of definitions of ethnic Chinese in urban Thailand). Thus the sex ratio of desired children for urban ethnic Thais in LS2 is quite similar to results for rural respondents in NS, of whom only a small proportion would be ethnic Chinese. Results from the FPHH study for a large sample of married women in the northeast, the vast majority of whom were residing in rural areas, indicate a similar sex ratio of 1.11 for the reported desired number of sons and daughters (Porapakkham and Bennett, 1978:104-105).

Although a distinct son preference is apparent for male respondents, only a very small percentage of either men or women indicate they wish to have no daughters.[3] The sex ratio of desired children depends quite strongly on the total number of desired children. As Table 51 shows, respondents who wanted an even number of desired children overwhelmingly indicated an equal number of

TABLE 51 Percent Distribution of Desired Number of Sons, by Residence and Desired Number of Children Among Currently Married Women Aged 15-44, and Male Household Heads with Wives Aged 15-44 Who Expressed Desired Family Sizes of Five or Fewer Children, 1979: Thailand

Residence and Desired Number of Children	Married Women: Desired Number of Sons 0	1	2	3+	Total Percent	N	Male Household Heads: Desired Number of Sons 0	1	2	3+	Total Percent	N
Rural												
1	42	58	--	--	100	19	10	90	--	--	100	10
2	2	96	3	--	100	397	0	92	8	--	100	213
3	2	34	63	1	100	297	0	26	70	3	100	202
4	0	4	88	8	100	405	1	2	85	11	100	245
5	1	4	37	59	100	112	0	7	22	71	100	90
Urban												
1	40	60	--	--	100	10	--	--	--	--	--	2
2	1	91	8	--	100	101	3	80	17	--	100	30
3	2	35	62	2	100	63	0	26	68	6	100	50
4	0	3	90	8	100	79	0	0	86	14	100	36
5	0	0	20	80	100	15	0	0	9	91	100	11

Notes: Respondents not stating numerical responses to questions on the desired number of sons and daughters are excluded from this table. Totals of percents may differ from 100 due to rounding.

Source: NS.

desired sons and daughters, while those who expressed an odd number of desired children were very likely to indicate a preference for more sons than daughters. Thus when couples express a desired family size of two--which appears, by the trends presented above, to be increasingly the case--they are typically thinking in terms of one son and one daughter. A preference for one child of each sex characterizes men almost as much as women and may help explain why very few respondents expressed a desired family size of fewer than two children.

Even when we combined respondents stating odd and even family sizes, results from NS show that the majority of both rural and urban women and rural men prefer equal numbers of sons and daughters, as shown in Table 52. Only among urban males do less than a majority opt for equal numbers of children of each sex. Clearly, however, when unequal numbers of sons and daughters are desired, respondents are more apt to opt for more sons than for more daughters. In brief, the attitudinal data on gender preferences suggest that some moderate son preference coexists with a more dominant preference for a balanced sex composition. Moreover, son preference is clearly stronger among men than among women.

Indirect evidence on the pattern of gender preferences in Thailand is provided in Table 53, which compares the

TABLE 52 Percent Distribution of Sex Composition Preferences by Residence Among Currently Married Women Aged 15-44, and Male Household Heads with Wives Aged 15-44: Thailand

	Married Women		Male Household Heads	
Preference (in percent)	Rural	Urban	Rural	Urban
More daughters than sons	15.1	12.8	11.7	11.5
Equal numbers	59.1	60.5	52.8	39.6
More sons than daughters	25.9	26.7	35.4	48.9
Total percent	100	100	100	100
Total N	1,315	281	844	139

Note: Respondents not stating numerical responses to questions on the desired number of sons and daughters are excluded from this table.

Source: NS.

TABLE 53 Percent Not Wanting Additional Children by Number and Sex Composition of Living Children and by Residence Among Currently Married Women Aged 15-44, and Among Male Household Heads with Wives Aged 15-44, with Two or Three Living Children: Thailand

	Rural						Urban					
	Married Women				Male Heads		Married Women				Male Heads	
Number of Living Children and Sons	LS1 1969	LS2 1972	NS 1979	CPS2 1981	LS2 1972	NS 1979	LS1 1970	LS2 1973	NS 1979	CPS2 1981	LS2 1973	NS 1979
Two Children												
No son	(26)	(41)	41	52	(46)	(47)	32	38	(60)	67	(43)	--
1 son	52	53	64	71	64	64	45	49	(76)	76	58	(73)
2 sons	(59)	(41)	54	55	(58)	(66)	(35)	26	(38)	72	(54)	(40)
Three Children												
No son	(72)	(62)	(79)	71	(61)	(71)	(42)	(48)		(78)	(67)	
1 son	(75)	70	66	86	76	82	60	69		88	78	
2 sons	63	77	80	85		74	63	73			89	
3 sons	(64)	(67)	(69)	76		(88)	(56)	(61)			87	

Notes: Couples who were sterilized but not asked if they desire more children are assumed not to want more. Results based on 10-49 cases shown in parentheses; results based on fewer than 10 cases not shown.

Sources: LS1 results from Prachuabmoh et al. (1974); LS2 results from Knodel and Prachuabmoh (1976);
CPS2 results from Kamnuansilpa, et al. (1982).

percentage not wanting additional children according to the sex composition of the family at the time of the survey. Since most of the respondents indicated a preference for either two or three children, analysis is limited to respondents with two or three living children. Results for both rural and urban married women with two children are consistent in showing that those with a balanced composition are the most likely to indicate they wish to stop childbearing. Among women with three children, the results are less clear but generally point to those with at least one child of each sex being more likely to want to stop childbearing than are women with all three children of the same sex. When women with two or three children who have all sons are compared with those who have all daughters, there is some tendency for high percentages of those with all sons to indicate a desire to stop childbearing, although several exceptions are apparent.

Results for male heads are reasonably consistent in indicating that those with two or three children and no sons are the least likely to want to stop childbearing. Apparently the desire to have at least one son is more pronounced for males. Results are rather mixed with regard to whether men with at least one son and one daughter or those with all sons are more likely to indicate that they wish to have no more children. In general, the results are reasonably consistent with the attitudinal data on desired number of sons and daughters, that is, they indicate a dominant preference among women for balance in the sex composition of children and a stronger son preference among men than among women.

Additional evidence of a pervasive desire for at least one child of each sex is provided by data from SOFT. Among currently married "exposed" women with two living children who wanted another child, all of those with no sons preferred their next child to be a son while only 2 percent of those with two sons did; in addition, exactly half of those with a son and a daughter preferred their next child to be a son (Institute of Population Studies and National Statistical Bureau, 1977, Volume II, Table 3.2.2A).

If preferences for sex composition of offspring have a measurable impact on fertility, then we would expect the practice of contraception to be related to the number of sons and daughters a couple already has (Freedman and Coombs, 1974). The results in this regard, presented in Table 54, do not show an entirely consistent pattern.

TABLE 54 Percent Currently Practicing Contraception by Number and Sex Composition of Living Children, by Residence, Among Currently Married Women Aged 15-44 with Two or Three Living Children: Thailand

Number of Living Children and Sons	Rural LS1 1969	Rural LS2 1972	Rural NS 1979	Rural CPS2 1981	Urban LS1 1970	Urban LS2 1972	Urban NS 1979	Urban CPS2 1981
Two Children								
No son	(4)	(22)	49	60	27	44	(87)	71
1 son	10	30	65	70	28	44	(88)	76
2 sons	(9)	(21)	55	65	18	44	(47)	69
Three Children								
No son	(33)	(52)	(67)	57	33	(43)	(74)	(78)
1 son	(18)	36	57	68	41	54		79
2 sons	13	31	69	68	43	65	(70)	81
3 sons	(7)	(33)	(50)	65	(42)	(49)		(90)

Note: Results based on 10 to 49 cases shown in parentheses; results based on fewer than 10 cases not shown.

Sources: LS1 results from Prachuabmoh et al. (1974); LS2 results from Knodel and Prachuabmoh (1976); CPS2 results from Kamnuansilpa et al. (1982).

Among rural women with two children in all surveys, and to a lesser extent among urban women, those with one son and one daughter were the most likely to be practicing contraception. Such a pattern is consistent with a preference for a balance of children of each sex. Both rural and urban women with three children, however, show little consistency in the relationship between contraceptive practice and number of sons.

One problem with using tabulations such as those in Tables 53 and 54 as indicators of the influence of sex preferences on fertility is that they ignore the heterogeneity of preferences within the population. As Tables 51 and 52 demonstrated, there is some variety in the preferred sex composition of families, although the extent of heterogeneity may be somewhat exaggerated due to rationalization.[4] To the extent that couples at a given parity have different preferences for combinations of sons and daughters, differences in the percentage not wanting more children or practicing contraception among those with different combinations of living sons and daughters would be reduced compared to a situation where

everyone shared the same sex composition preference (McClelland, 1979). In order to avoid this problem, we have compared the stated desired number of sons and daughters with the actual number of sons and daughters and classified respondents who had exactly the number of children they said they wanted according to whether or not the combination of sons and daughters was as they said they wanted. The fact that there is a considerably higher proportion of respondents whose actual and preferred sex composition of children agreed than would be expected by chance indicates that some rationalization of the existing sex composition exists. Couples that had not yet reached the desired number of children or who had exceeded the desired number were placed in separate categories.

The comparison of these categories with respect to the percentage of respondents in them who wanted no more children (both for married women and male heads of households) and with respect to the percentage using contraception (for married women) are shown in Table 55 for respondents with two, three, and four living children. Of particular interest is the comparison among women whose desired and actual number of children are the same, between those who also achieved their preferred sex compositions, and those who did not. In general, both for married women and for male heads of households, those who have both the desired number and desired combination of sons and daughters are more likely to indicate that they want no more children than those who have the desired number but not the desired sex composition. The differences, however, are not large, except for women with two children. Interestingly, it is only among women with two children that contraceptive use is higher among those who have both the desired number and sex composition than among those who have the desired number but not the desired sex composition. For women with three or four living children, the difference between these two groups is small and in the opposite direction from that expected. Thus it appears that it is mainly among couples who want two children that not having the desired sex composition leads to an additional child.

A more detailed analysis (not shown) reveals that virtually all the respondents who prefer two children but do not have their desired sex composition have either all sons or all daughters. Although the small number of cases precludes firm conclusions, the results suggest that some proportion of these respondents are motivated to go on to have an additional child in hopes of having

TABLE 55 Percent Wanting No More Children and Percent Currently Practicing Contraception, by Number of Living Children and Whether the Number and Sex Composition of Living Children Corresponds to the Desired Number and Sex Composition, Among Currently Married Women Aged 15-44 and Male Household Heads with Wives Aged 15-44, with Two, Three, or Four Living Children: Thailand

Comparison of Living Children with Desired Number and Sex Composition	Percent Wanting No More Children						Percent Using Contraception		
	Married Women by Living Children			Female Heads by Living Children			Married Women by Living Children		
	2	3	4	2	3	4	2	3	4
Number not reached	33	46	(50)	39	65	(54)	52	44	(53)
Number but not sex composition reached	(66)	(91)	93	(85)	(93)	(91)	62	(77)	68
Both number and sex composition reached	95	95	99	91	(93)	(98)	79	73	66
Number exceeded	--	91	97	--	(88)	(93)	--	79	76

Notes: Results based on 10 to 49 cases are shown in parentheses; results based on fewer than 10 cases not shown. Respondents not stating numerical responses to questions on the desired number of sons and daughters are excluded from this table.

Source: NS.

one of the opposite sex, particularly if they have no sons. Of respondents who have three or more children, the motivation not to go beyond the desired number seems to largely overwhelm sex composition considerations.[5] Finally, the fact that a considerable proportion of respondents whose number of living children is less than the preferred number of children nevertheless indicate that they wish to have no more children underscores the hypothetical nature of the question on preferred number of children. Quite possibly, respondents are thinking in terms of an ideal situation in which constraints on the number of children are much less than they feel actually exist in their current situation.

In sum, the direct and indirect evidence on gender preferences in Thailand suggests that there are differences in the attitudes of husbands and wives; that the dominant preference is probably for at least one child of each sex; that there is also some son preference, especially among men; and that avoidance of exceeding the desired family size is more important that achieving a desired sex composition, except perhaps for a sizable proportion of those who wish to have one son and one daughter initially but whose first two children are of the same sex. The evidence is also consistent with the suggestion that the desire for both a son and a daughter tends to set a lower limit on the extent to which family size can decline.

ATTITUDES TOWARD BIRTH CONTROL

A number of different questions have been included in the various surveys that have attempted to determine the attitude of the Thai population toward the use of deliberate fertility control within marriage. In general, they indicate overwhelming approval of the use of contraception but at least an overt disapproval of abortion.

Buddhism as adhered to in Thailand apparently presents no obstacles to the acceptance and practice of contraception and in some respects may indirectly facilitate it. Buddhism contains no scriptural prohibitions against contraception nor is Buddhist doctrine particularly pronatalist (Ling, 1969). Thai Buddhism stresses the role of the individual in seeking his or her own liberation which may indirectly contribute to tolerance and acceptance of practices designed to control the individual's fertility (Lauro, 1979).

Several recent studies of Buddhist monks confirm that there is little religious opposition to contraception. Among a reportedly representative national sample of almost 2,000 monks, 83 percent indicated they were supportive of the government's pro-family planning policy and only 5 percent indicated they were not supportive, with the remainder not having an opinion (Muangman and Hirunraks, 1980). The same study found that almost four out of five monks agreed that married couples should practice family planning and only 6 percent disagreed (Kanchanasinith et al., 1980). In the same study, 100 Muslin imams were also interviewed. Approval was slightly lower among the imams although still quite high, with 71 percent agreeing and 10 percent disagreeing that married couples should practice family planning.

Lay persons also apparently do not feel that contraception is against their religion. Among a sample of married men in southern Thailand, results of a 1970 survey indicate that 86 percent of Buddhists and 82 percent of Moslems said contraception was not against their religion; only 20 percent of the Buddhists and 6 percent of the Moslems said contraception was counter to their religions, with the remainder not indicating an opinion (Jones and Soonthornthum, 1971).

Religious objections to abortions are quite different. In particular, the Buddhist proscription against taking life appears to directly contravene abortion (Ling, 1969). The study of religious leaders found that 98 percent of both the monks and imams perceived induced abortion as being against religious doctrine. Nevertheless, as Lauro (1979:267) points out, the moral issue of abortion is confounded by the general Buddhist notion that the seriousness of taking a life increases with the size and complexity of the life being taken and by the general cultural proclivity for leaving decisions to individuals.

Given the rapid increase in contraceptive prevalence over the last decade, it is hardly surprising that Thais are favorably disposed toward the idea of family limitation and the practice of birth control within marriage. Lauro (1979:230-231) was impressed, even surprised, at the pervasiveness and depth of interest in matters of modern birth control among women in the central Thai village in which he did his fieldwork. However, anthropological accounts based on fieldwork prior to the recent upsurge in birth control activity would probably not have led one to expect that the Thai population would be so willing to adopt family planning practices. On the other

hand, the Potharam Study conducted in 1964 did clearly point to fairly widespread interest in family planning and motivation to control fertility in that rural district (Hawley and Prachuabmoh, 1971b). This finding has been confirmed in the national studies that took place later.

In the Potharam Study and both rounds of LS, respondents were asked the following rather typical question used in KAP surveys about their attitude toward the idea of family planning: "If you knew of a simple and harmless way to avoid becoming pregnant too often or having too many children (more than you want) or having children too close together, would you be in favor of a married couple using such a method?" The purpose of the question was to define the basic idea of family planning for the respondents, in case the concept was foreign to them, and then to elicit approval or disapproval. The question is indirect in that it does not mention family planning or contraception per se and indeed is rather cumbersome. There is ample evidence that the wording of the question may have led to some confusion in interpreting its meaning on the part of respondents. For example, in the Potharam Study, some women indicated disapproval in response to the question and yet indicated in response to another question that they wanted to do something to regulate the number of children they had and wanted to learn about methods of family planning (Hawley and Prachuabmoh, 1971b:33). In LS1, substantial proportions of women who indicated they did not approve of family planning in response to this question were themselves currently practicing or intending to use contraception (Knodel and Pitaktepsombati, 1973).

While results from LS1 indicated that the majority of married women in reproductive ages expressed approval in response to this question, close to a third of rural women and about one in four urban women indicated they did not approve (Knodel and Pitaktepsombati, 1973). The approval rate was about the same for rural women in LS2 three years later but showed a noticeable increase for urban women (Knodel and Pitaktepsombati, 1975). Nevertheless, approximately 18 percent of ever-married urban women who expressed a definite opinion indicated disapproval in response to this indirect question. A direct question, however, was also included in the urban phase of LS2; it asked simply: "Do you approve of family planning?" About 40 percent of ever-married women indicated they either did not understand the question or were coded "don't know, no answer." Of those who pro-

vided a definite opinion, 93 percent indicated approval and only 7 percent indicated disapproval. Moreover, of those who indicated disapproval to the indirect question, only 11 percent indicated disapproval to the direct question; twice a many indicated approval, and the large majority either indicated they did not understand or were coded "don't know, no answer." It is also interesting to note that the percent indicating incomprehension or giving no answer to the direct question increased sharply with age from less than one in four for ever-married women under 30 to half of women aged 45-49 and well over half for older women. This may reflect a time trend in which recent cohorts entering the reproductive years were increasingly aware of the concept of deliberate fertility control within marriage.

In the urban phase of LS2, male household heads were also asked a direct question about their approval of family planning and in addition were asked whether they approved of their wives practicing family planning. Although a substantial minority indicated they did not understand the question or did not provide an explicit opinion, of those who did, well over 90 percent indicated approval to both questions.

For the reasons discussed above, we believe that the responses to the standard indirect question tend to underestimate the extent of approval or at least receptivity to the idea of family planning in Thailand in these earlier surveys and that the vast majority of respondents who understood the concept approved of it. In subsequent surveys, direct questions were asked typically, as it was no longer felt that the concept of family planning needed to be explained, given the rapid increase in knowledge of contraceptive methods and prevalence of contraceptive use. Results from several of these surveys are indicated in Table 56 and are consistent in indicating the widespread approval of birth control among both men and women and in both rural and urban sectors of the population.[6]

An even more consistent finding in survey results in Thailand is an overt disapproval of abortion, except under special circumstances. More than 90 percent of women interviewed in the Potharam Study in 1964 indicated disapproval of abortion in response to a question which did not specify any circumstances (Hawley and Prachuabmoh, 1971b). In a survey of the Bangkok suburb of Bangkhen in 1968, only 4 percent favored abortion if the women simply wanted no more children, although 92 percent favored it

TABLE 56 General Attitudes Toward the Use of Birth Control as Reported in Selected Surveys: Thailand

	Approve	Dis-approve	Depends	Don't Know	Total Percent	N
WRPS, 1975: Rural						
Married men	76	15		8	100	925
Married women	86	9		6	100	425
Total	79	13		8	100	1,350
NS, 1979: Ever-Married Women						
Rural	81	14	2	3	100	2,154
Urban	82	12	4	2	100	444
Total	81	14	2	3	100	2,598
AFPH, 1979: Currently Married Women						
Rural	85	8	4	3	100	2,240
Urban	88	6	5	2	100	747
Total	86	7	4	3	100	2,987
CPS2, 1981: Ever-Married Women						
Own opinion	96[a]	2	1	1	100	7,038
Perception of husband's view	87	5	0	8	100	7,038

[a]Includes all women currently using contraception.

Sources: Deemar Company, Ltd. (1975); Kamnuansilpa and Chamratrithirong (1982); and unpublished tabulations.

under circumstances where the birth endangered the life of the mother (Cowgill et al., 1969). In a national rural sample interviewed in 1972, only 19 percent of married women indicated approval of abortion if the couple did not want or could not afford another child (Burnight and Leoprapai, 1975). The most recent figures of a national sample come from NS and indicate very low percentages of ever-married women approving abortion as a means of avoiding a birth under normal circumstances. For example, only 6 percent of either urban or rural women indicated approval under conditions of contraceptive failure. However, a large majority indicated approval under special circumstances such as danger to the mother's health and rape (Institute of Population Studies, 1981).

The lack of public approval of abortion, as indicated by opinion survey evidence, seems to be inconsistent with indications that the practice of abortion is rather widespread. As Riley (1972:227) points out, while inducing abortion is theoretically considered a moral wrong, it is also recognized as a practice that might be carried out by a reasonable person under certain circumstances. The opinion surveys also show clearly that approval of abortion is highly dependent on the severity of the circumstances described in the question (see review of studies by Baker and Clinton, 1981). Quite likely the same set of circumstances when confronted in reality by the respondent herself may be perceived as considerably more severe and thus justifying abortion than when posited in the abstract in a survey question. Given the strong emphasis that individuals are responsible for their own fate in Thai culture, there may be considerably more social tolerance, if not approval, of abortion than indicted by the overwhelming disapproval expressed in response to opinion questions. Thus it is of interest that despite the widespread perception that abortion is being used with increasing frequency in Thailand as a birth control measure, neither the Buddhist hierarchy nor the government has spoken out strongly on this issue.[7] Apparently abortion is not the highly salient moral issue in Thailand that it is in some countries (Lauro, 1979).

NOTES

[1]Responses of currently married women, 15-44, whose present marriage is of less than five years duration are also less likely to be affected by rationalization, are

unlikely to be affected by selectivity and reflect very recent trends. Results based on LS1, NS, and CPS2 for these women show trends very similar to married women under 25:

	LS1 1969/1970	NS 1970	CPS2 1981
Rural	3.3	2.8	2.5
Urban	3.0	2.6	2.2
National	3.2	2.8	2.4

[2]Although Table 61 in Muangman (1979:15), which presents the relevant data, is labeled "Expected Number of Children," the text describing the findings suggests the question on which it is based referred to desired family size. In any event, for unmarried Thai adolescents, all of whom presumably have not yet started their reproductive careers, the distinction between expected and desired family size is probably unimportant.

[3]Rationalization of existing children might reduce the percent expressing a preference for no son or no daughter. However, NS national data on the preferred number of sons and daughters among currently married women aged 15-44 and married less than five years and among male household heads with wives aged 15-44 and married less than five years (groups presumably much less prone to rationalization) indicates similarly low percentages stating such a preference (provided they wanted at least one child):

	Percent Wanting No	
	Sons	Daughters
Women	1.8	3.5
Men	0.0	9.1

[4]For example, even if everyone had exactly the same preference for a particular combination of sons and daughters at the onset of their reproduction, if some of them later rationalized that they wanted the sex

composition that they attained, even though it was different from the one that they had initially wanted, this rationalization would lead to the appearance of heterogeneity in terms of preferences when in fact none existed initially.

[5]For couples who want at least one child of each sex and who have only children of one sex, having an additional child gives them a chance to meet the goal of having at least one child of each sex even if the resulting sex composition would be different from the one initially stated, given the necessity of going beyond the initial number of desired children. If the actual sex composition differs from the desired sex composition in any other way, it is not a simple matter to determine whether having an additional child could necessarily improve on the existing composition. Moreover, as McClelland (1979) points out, couples actually risk worsening the sex composition by having an additional child even when their actual sex composition is different from their desired composition.

[6]Although the wording of the questions was not identical, familiarity with the concept of family limitation or birth control was probably sufficiently widespread by the mid-1970s so that any reasonable wording directly asking about birth control or family planning would have been understood by the large majority of respondents and would have elicited a similar response.

[7]An attempt in 1981 to "liberalize" Thailand's restrictive abortion law was defeated in Parliament in 1981.

CHAPTER 8

THE PERVASIVENESS OF REPRODUCTIVE CHANGE DIFFERENTIALS BY EDUCATION, INCOME, AND RELIGION

Our examination of fertility trends, proximate variables, and family-size preferences clearly indicates that the current fertility transition taking place in Thailand is at least as much a rural as an urban phenomenon. Thus, reproductive change in Thailand appears to have permeated at least one very fundamental societal division. In this chapter, we explore further the pervasiveness of reproductive change by examining differentials in fertility, preferred numbers of children, and several proximate variables according to educational attainment, income, and religion. These social, economic, and cultural dimensions were chosen in part because of availability of information on them in a number of the fertility-related surveys. But more importantly, these variables represent basic characteristics that are generally assumed to affect a wide variety of social behavior and in particular are commonly expected to differentiate with respect to fertility-related attitudes and actions. Our goal in this chapter is primarily a descriptive one. We do not attempt to explain such differentials as they exist in Thailand except to a very limited extent within the proximate determinants framework. Rather, the main purpose is to determine how widespread the transformation of reproductive behavior and attitudes has become within the relatively brief time span of Thailand's fertility transition.

EDUCATIONAL DIFFERENTIALS

Besides place of residence, probably no other social variable has been as frequently associated with fertility differentials as education. It is generally

expected that at any given point in time, fertility and educational levels are inversely related and that during the fertility transition, better educated couples lead in the adoption of contraception and reduction of fertility. In addition, a common expectation is that improvements in the educational levels of the population in the course of socioeconomic development will contribute to declining fertility.

In Thailand, primary education comprises four years for the lower grades and three years for the upper grades. Relatively few women in the reproductive ages, especially in rural areas, have received more than a lower primary education, but at the same time there has been steady progress toward increasing proportions receiving a full four years of schooling. Until recently, four years of education was compulsory. The requirement has recently been extended to six years, but the extension is an ongoing process rather than a sudden universal change.

The implementation of this change, moreover, has not yet had much impact on the educational distribution of women in the reproductive ages in rural Thailand, the large majority of whom have attended school exactly four years. According to the 1960 census, only 4 percent of women 20-44 years of age had received more than four years of schooling. This increased to 8 percent by 1970 and to 11 percent by 1975. In 1970, 28 percent of women 20-44 had less than four years of schooling while fully 65 percent reported having exactly a fourth-grade education. The substantial increases over time in the proportion of women who received at least a fourth-grade education is evident in the comparisons of different age cohorts from the 1970 census. For example, the percentage of women who completed at least fourth grade was only 16 percent for women at all ages 45 and above, 54 percent for the 40-44 age group, and 88 percent for the 15-19 age group.

In analyzing data from the 1-percent sample of the 1960 census, Goldstein et al. (1972) found an inverse relationship between educational attainment and cumulative fertility in Thailand. The number of children ever born was lower for literate women in both rural and urban residence categories and a woman's educational attainment was inversely related to her fertility. Likewise, in analyzing the 2-percent sample from the 1970 census, Chamratrithirong and Boonpratuang (1977) found a substantial negative relationship of children ever born to educational attainment in all regions of Thailand and in both rural and urban places. A comparison of these two

studies suggests that educational differentials in completed fertility had increased between the two censuses.[1]

Table 57 presents several measures reflecting fertility and family-size preferences for currently married Thai women according to their educational attainment. Subdivision of the samples into educational categories reduces substantially the number of women on which each particular measure is based and thus increases the likelihood that the results will be affected by sampling error. This is particularly true for the highest educational category in the rural samples since so few rural women attended school past the basic four years of lower primary education. In addition, there are substantial differences in the distribution of educational attainment between the rural and urban sectors of the population, which should be kept in mind. Generally, substantially larger proportions of urban women fall in the highest educational attainment categories and substantially smaller proportions in the lowest. Given the recent trends toward increasing education, the age distributions within each educational attainment category differ considerably. In order to control for this, all results are standardized for age.

Results referring to children ever born are shown for LS1, NS, and CPS2. The same inverse relationship between cumulative fertility and education found in the census data referred to above is evident in the survey results. However, there is no sign of contraction in the differentials over time, although firm conclusions in this respect are not justified, given the problems with sample size. Educational differentials in the average number of living children are slightly less pronounced than for children ever born, especially for the rural sample, reflecting the higher child mortality experienced by women in the lower educational categories.

An inverse association between education and the expected number of children is apparent for all surveys shown. For the rural sample, the smallest differences are evident for the two earliest surveys. The most recent survey indicates that rural women with less than a fourth-grade education expected almost one child more than women with more than four years of schooling. The difference is even more pronounced for urban women. While also generally inverse for the preferred number of children, the relationship is considerably less pronounced. Data on the preferred number of children for

TABLE 57 Mean Number of Children Ever Born, Living Children, and Marital Fertility Index (I_g'), for Currently Married Women Aged 15-49; and Mean Number of Children Expected, Preferred for Self, and Preferred for Daughter, for Currently Married Women Aged 15-44, Standardized for Age, by Educational Attainment and Place of Residence: Thailand

	Place of Residence and Number of Years of Schooling					
	Rural			Urban		
	0-3	4	5+	0-3	4	5+
Children Ever Born						
LS1 1969/70	4.5	4.2	(3.5)	4.0	3.6	2.6
NS 1979	4.1	3.6	2.2	3.6	3.0	2.4
CPS2 1981	3.8	3.4	2.7	3.3	2.8	1.9
Living Children						
LS1 1969/70	3.7	3.6	(3.4)	3.7	3.3	2.5
NS 1979	3.6	3.2	2.1	3.5	2.8	2.3
CPS2 1981	3.3	3.1	2.5	3.1	2.6	1.9
Expected Number						
LS1 1969/70	4.6	4.4	(4.1)	4.4	4.0	3.7
LS2 1972/73	4.0	3.9	3.7	4.4	3.8	3.1
SOFT 1975	4.2	4.0	3.1	3.9	3.4	3.1
CPS 1978/79[a]	3.9	3.6	3.3	3.5	3.2	2.7
NS 1979	4.1	3.8	2.8	4.0	3.4	2.7
AFPH 1979[b]	4.0	3.7	3.3	3.9	3.4	2.8
CPS2 1981	3.7	3.4	2.9	3.4	2.9	2.3
Preferred Number						
LS1 1969/70	4.1	3.8	(4.0)	3.8	3.7	3.2
LS2 1972/73	4.0	3.9	3.8	3.6	3.5	3.0
SOFT 1975	3.8	3.6	3.2	3.4	3.4	3.1
NS 1979	3.5	3.3	2.7	3.7	2.9	2.7
AFPH 1979[b]	3.3	3.2	2.9	2.9	3.0	2.7
CPS2 1981	3.2	3.0	2.5	3.0	2.6	2.3
Preferred Number for Daughter						
AFPH 1979[b]	2.9	2.8	2.7	2.8	2.8	2.6
I_g' (for 2 years prior to survey)[c]						
LS1 1969/70	.67	.69	(.50)	.52	.50	.39
LS2 1972/73	.62	.58	(.58)	.53	.45	.44
SOFT 1975	.56	.54	.45	.47	.43	(.51)
NS 1979	.48	.39	(.38)	(.31)	.43	(.46)
I_g' (for years prior to survey)						
CPS2 1981	.47	.46	.49	.47	.45	.49

TABLE 57 (continued)

Notes: Expected number of children equals the number of living children plus the additional children desired. The age distribution of currently married women in the whole country as reported in the 1970 census was used as the basis for the age standardization. Results for children ever born and living children in parentheses are based on fewer than 50 cases; I_g' results shown in parentheses are based on an average of fewer than 50 woman years of observation per five-year group.

[a]Urban sample refers to Bangkok metropolitan area.
[b]Results refer to a universe of 20 provinces; the urban sample refers to provincial urban only.
[c]Not directly comparable to I_g' results in Tables 5 or 6 that are based on births during one year prior to the survey.

Sources: Knodel et al. (1980); Kamnuansilpa and Chamratrithirong (1982); and unpublished tabulations.

daughters collected in the AFPH survey show almost no association between family-size preference and education, suggesting that in the absence of rationalization, the association between education and preferred number for self might be even weaker, although it should be noted that even preferred number for self shows a particularly weak relationship in the AFPH results.

Current marital fertility as measured by I_g' is also inversely related to education for rural women in most surveys, but almost no relationship is evident in results from CPS2, the most recent survey. Less consistency in terms of an inverse relationship is indicated for urban women, and again the CPS2 results suggest little association with education. Moreover, preliminary results from NES, a large survey of northeastern women, indicate almost no educational differential in current marital fertility, with I_g' for 1979 equaling .46, .48, and .47 for women in the three successive educational categories.

Perhaps the most important picture emerging from the results on educational differentials is that the recent transformation in reproductive behavior and family-size preferences in Thailand is occurring in all educational categories. Less-educated women have participated in the changes in the last decade at least as much as better educated women.

Educational differentials are available for several of the principal proximate variables. Table 58 presents selected measures of nuptiality by educational attainment based on the 2-percent sample of the 1970 census, while Figure 8 shows the percentage single by age for men and women at different educational levels.

TABLE 58 Selected Measures of Nuptiality by Educational Attainment, 1970: Thailand

Nuptiality Measure	No Schooling	Primary	Secondary	University
Singulate Mean Age at Marriage				
Men	24.5	24.3	26.7	29.5
Women	20.2	21.7	25.4	29.2
Percent Single 40-44				
Men	5.4	2.2	5.4	3.6
Women	3.9	3.5	11.1	31.7
Marital Status Indexes				
I_m (married)	.770	.646	.317	.291
I_s (single)	.148	.305	.661	.689
I_d (divorced)	.016	.011	.004	.002
I_p (separated)	.021	.020	.013	.014
I_w (widowed)	.044	.018	.004	.004

Note: Primary refers to grades 1-7, secondary to grades 8-12.

Source: Adapted from Chamratrithirong (1980).

In most populations, higher educational attainment is associated with later ages at marriage, and Thailand is no exception in this respect (see, e.g., Durch, 1980). For both men and women, the differences in the singulate mean age at marriage are small between those with no schooling and those with primary schooling, but higher levels of education are associated with considerably later ages at marriage. The impact is greater for women than for men. Permanent nonmarriage as measured by the percent single at ages 40-44 show little association with education for men but show a marked increase with greater education for women for levels past primary schooling. As Figure 8 shows, educational differentials in the percent single at all ages are more pronounced for women than for men, and a considerable proportion of women with secondary and particularly with university education never marry.

These same differences are reflected in the marital status indexes I_m and I_s and suggest that nuptiality differences by educational categories can have very substantial impacts on educational differences in cumulative fertility. There is, of course, no guarantee

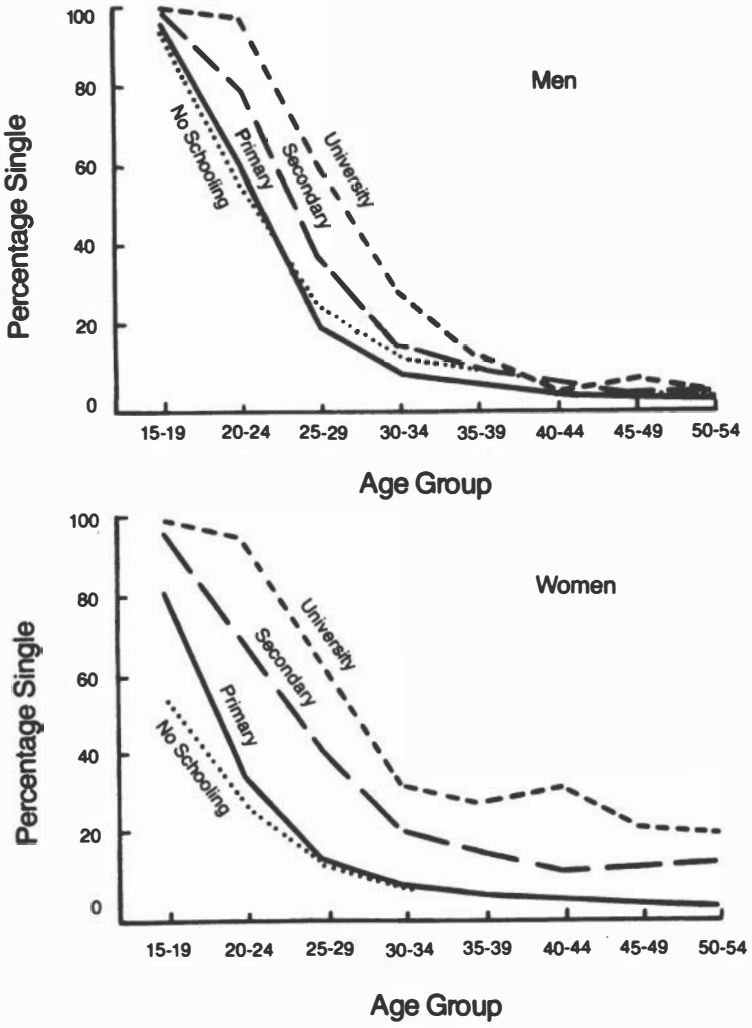


FIGURE 8 Percentage of Men and Women Single by Age, for Four Educational Levels, 1970: Thailand

Source: Chamratrithirong (1980).

that these differentials will persist, particularly as the educational composition of the Thai population changes. It is worth noting, however, that the changes in educational composition of women in reproductive ages could have had only limited impact on the overall nuptiality pattern since only modest increases have occurred in any absolute sense in the percentage of women going beyond primary school, the point at which the impact on marriage seems to make a substantial difference.

The marital status indexes point to a distinct inverse association between education and marital dissolution. This relationship would tend to counterbalance the positive association between age at marriage and education in terms of consequences for educational differentials in cumulative fertility among ever-married women. Educational differences in the proportion of women widowed reflect differences in mortality associated with socioeconomic status. Lower proportions of divorced or separated among the better educated may have several explanations, as Chamratrithirong (1980) has discussed. Since the age at marriage is higher among the better educated, such women are exposed to a shorter period of risk of divorce or separation. In addition, women of higher socioeconomic status may tend to remarry more than women of lower socioeconomic status. Marital stability could be related to financial stability, which presumably could be greater among the better educated. Since the three marital status indexes referring to the different types of marital dissolution are low in an absolute sense regardless of educational attainment, differentials and marital disruption are unlikely to account for much of the educational differentials in fertility.

Analysis of data from SOFT also points to a clear inverse relationship between marital dissolution and education. Based on life table analysis, the probability of first marriages being dissolved within ten years based on the experience of women aged 25-49 is 21 percent for those with no education, 13 percent for women with primary education, and 10 percent for those with middle education (Smith, 1981). Since this analysis explicitly takes marriage duration into account, the differences cannot be a result of differences in the period of exposure. However, widowhood is included as one source of dissolution, so the results might reflect in part differential mortality risks by education.

Data on the relationship of breastfeeding with the mother's number of years of schooling are shown in

Table 59. The measure of breastfeeding is the percent of mothers still breastfeeding their most recent child at the time of the survey among women who had a birth within three years prior to the survey. In several of the data sets, information on current breastfeeding status was available only for nonpregnant women. The results indicate that breastfeeding has been declining among all educational groups with the possible exception of better educated urban women, who were already characterized by very low levels of breastfeeding in the earliest survey. For all surveys, the highest educational group was characterized by distinctly lower proportions still breastfeeding than the other two groups. For several surveys, the most highly educated rural women were characterized by even lower proportions still breastfeeding than their less educated urban counterparts, although it should be stressed that even by 1979 only a very small fraction of rural women in reproductive ages belonged to the highest educational category. To the extent that decreased breastfeeding influences educational differentials in fertility (through ending postpartum infecundability), it operates in a direction opposite to the one that has generally prevailed. All else being equal, the shorter breastfeeding of the better educated should lead to higher rather than lower fertility. Obviously educational differences in other proximate determinants must outweigh the influence of decreased breastfeeding.

Educational differentials in the percent of married women who are currently practicing and who ever practiced contraception are shown in Table 60. Most surveys show a direct relationship between contraceptive prevalence and years of schooling in both rural and urban sectors of the population. Undoubtedly the educational differentials in marital fertility observed in many of the surveys reviewed is largely a result of these differentials in contraceptive use. While the results are not completely consistent in this respect, they generally point to a contraction in the educational differentials in the percent currently practicing over the period spanned by the surveys.

Clearly, the rapid increase in contraceptive prevalence has occurred among all educational groupings of the population and indeed has been, if anything, more rapid among the least educated women. While lesser educated women may have lagged behind briefly during the initial stages of the spread of contraception, the evidence suggests that a catch-up effect has already taken place. The experience of Thailand in comparison with the

TABLE 59 Percent Still Breastfeeding Most Recent Child Among Women with a Birth in the Three Years Prior to Interview, by Educational Attainment and Residence, Standardized for Number of Years Since Last Birth: Thailand

	Education of Women (years)		
	0-3	4	5+
Nonpregnant Women			
Rural			
LS1 1969	74.3	77.8	--
LS2 1972	75.0	72.3	(38.9)
SOFT 1975	70.8	67.6	49.5
NS 1979	59.9	57.4	(14.3)
Urban			
LS1 1970	48.1	47.2	22.1
LS2 1973	41.0	37.9	16.5
SOFT 1975	(36.9)	36.2	14.0
NS 1979	--	(29.0)	(22.6)
All Women			
Rural			
SOFT 1975	66.9	63.6	46.2
NS 1979	57.3	55.9	(14.3)
Urban			
LS2 1973	36.6	34.7	15.6
SOFT 1975	(31.9)	32.1	13.6
NS 1979	--	30.5	(22.1)

Notes: Standardization performed by applying equal weights procedure to results by successive categories of one-year duration each. Results based on 20 to 49 cases are shown in parentheses; results based on fewer than 20 cases are not shown.

Source: Adapted from Knodel and Debavalya (1980).

TABLE 60 Percent Currently Practicing and Percent Ever Practiced Contraception for Currently Married Women Aged 15-44, Standardized for Age, by Educational Attainment and Place of Residence: Thailand

	Place of Residence and Number of Years of Schooling					
	Rural			Urban		
Contraceptive Use and Survey Source	0-3	4	5+	0-3	4	5+
Percent Currently Practicing						
LS1 1969/70	7	13	(17)	28	31	36
LS2 1972/73	13	26	38	34	42	54
SOFT 1975	33	36	45	44	50	53
CPS 1978/79[a]	50	52	52	59	65	65
NS 1979	48	48	57	42	50	64
AFPH 1979[b]	43	48	47	60	58	64
CPS2 1981	52	58	61	64	63	66
Percent Ever Practiced						
LS1 1969/70	9	18	(20)	33	38	46
LS2 1972/73	20	33	(48)	51	53	65
SOFT 1975	43	51	67	66	62	73
CPS 1978/79[a]	67	71	77	83	87	86
NS 1979	55	64	71	77	70	81
AFPH 1979[b]	62	66	83	78	76	80
CPS2 1981	74	78	83	80	83	89

Notes: The age distribution of currently married women for the whole country as reported in the 1970 census was used as the basis of age standardization. Results in parentheses are based on fewer than 50 cases.

[a]Urban sample refers to Bangkok metropolitan area.
[b]Results refer to a universe of 20 provinces; the urban sample refers to provincial urban only.

Sources: Knodel et al. (1980); Kamnuansilpa and Chamratrithirong (1982); and unpublished tabulations.

historical record of Western countries points not only to a much accelerated pace of fertility transition but probably also to more pervasive participation during the early stages, at least with respect to educational groupings.

FAMILY INCOME

Determining family income is considerably more difficult than determining educational attainment. The concept of family income is far more complex and the subject matter more sensitive. Nevertheless, attempts were made in several of the surveys to collect information on recent family income, thus making it possible to examine differentials in reproductive behavior and attitudes along this dimension. The difficulties inherent in measuring income give reasons to be cautious in interpreting the results, especially since in most cases information on income was based on responses to a simple direct question. Moreover, current income is not necessarily an accurate reflection of a family's wealth. In interpreting results, one must keep in mind the reasonably rapid inflation in Thailand over the last decade; the same absolute family income at the beginning of the 1970s was worth considerably less by the end.

In the Longitudinal Study, information on family income was collected only for the rural phase of the second round. Table 61 shows a variety of measures of reproductive behavior and fertility desires for five income categories. Income is expressed in terms of the Thai baht (there were approximately 20 baht to one U.S. dollar during the 1970s). The sample was distributed more or less equally across the five income categories shown.

The results suggest only weak differences in cumulative fertility as measured by children ever born according to family income. Although the largest mean number of children ever born characterized the lowest income group, there is not a consistent inverse relationship among the remaining categories. Apparently, infant and child mortality is higher for the lower income group and thus in terms of the mean number of living children, they are not distinctly higher than several other income groups. Differentials in the expected number of children are even weaker than for cumulative fertility, with almost no differences evident across the income categories. A

TABLE 61 Selected Fertility-Related Variables by Family Income, Standardized by Age Among Rural Women with a Child Under Three Years Old, 1972: Thailand

Fertility-Related Variables	Annual Family Income (in baht)				
	Under 1,000	1,000-1,999	2,000-3,999	4,000-9,999	10,000 and over
Children ever born	4.4	3.8	3.8	4.1	4.0
Living children	3.7	3.3	3.3	3.7	3.6
Expected number	4.2	3.9	3.9	4.0	3.8
Percent pregnant	17	16	19	8	8
Months since last birth[a]	27	29	35	36	40
Percent current use of contraception	9	20	24	36	40
Percent ever use of contraception	14	27	27	43	43
Percent wanting no more children	61	54	56	65	60
Preferred number of children	4.1	3.9	4.0	4.0	3.6
Percent still breastfeeding last born child under 3[b]	79	78	78	68	56

Note: The age distribution of currently married women for the whole country as reported in the 1970 census served as the basis for the age standardization.

[a]Excluding currently pregnant women.
[b]Standardized for number of years since last birth by applying equal weights procedure to results tabulated by successive categories of one-year duration.

Source: LS2.

somewhat different picture is suggested for current fertility, as indicated by either the percent pregnant or the average open interval measured in terms of months since last birth. Percent of women pregnant among the two highest income categories is distinctly lower than for the other three, and a consistent inverse association is indicated between income and open interval. There appears to be a more or less inverse association between income and breastfeeding, again with the two highest income categories showing distinctly lower percentages still breastfeeding their last child under age three (after standardization for age of child). Whatever fertility-enhancement effect the lower breastfeeding might have is apparently more than compensated for by the rather sharp differentials in current use of contraception. A distinctly positive relationship is evident between income and percent of women currently practicing contraception; women in the highest income category are more than four times as likely to be practicing contraception as those in the lowest. Differentials in the percent who ever used contraception are less consistent but nevertheless generally in the same direction.

Finally, the two measures of fertility desires, the percent wanting no more children and the mean preferred number of children, show only weak differences across income categories.

One exception to studies that obtained information on family income through a simple direct question was SOFT, in which a more complex approach was taken. Family income was calculated as the sum of a variety of separate components, including farm income, which in turn was estimated indirectly from farm size, crops grown, and animals raised. In a study of economic factors in family-size decisions in Thailand, Arnold and Pejaranonda (1977) classified couples according to this measure of family income, dividing them into five roughly equal categories. Their study presents results of a multiple classification analysis which relates the preferred number of children as expressed by husbands and the percent of fecund women currently using contraception to family income as well as a variety of other variables. The differentials in preferred number of children and contraceptive prevalence according to family income are summarized in Table 62. Prior to adjustment for other socioeconomic variables, the preferred number of children among married men showed an inverse relationship with family income while contraceptive prevalence among fecund women showed a distinct

TABLE 62 Mean Preferred Number of Children Among Married Men with Wives Under Age 50 and Percent of Fecund Married Women Currently Using Contraception by Family Income, Unadjusted and Adjusted by Multiple Classification Analysis for Selected Socioeconomic Variables, 1975: Thailand

	Preferred Number of Children for Married Men		Percent of Fecund Women Currently Using Contraception	
Family Income	Unadjusted	Adjusted	Unadjusted	Adjusted
Level 1 (lowest)	4.4	4.2	29.8	33.5
Level 2	4.4	4.2	36.3	38.7
Level 3	4.0	3.9	41.9	42.0
Level 4	3.7	3.7	45.7	43.2
Level 5 (highest)	3.5	3.7	46.1	42.2

Notes: Preferred number of children adjusted for husband's and wife's education, place of residence, husband's occupation, wife's employment status, number of living children, and indexes of perceived cost and utility of children. Contraceptive use adjusted for all the above plus wife's age.

Source: Adapted from Arnold and Pejaranonda (1977).

positive relationship, similar to the LS2 findings. Adjustment for a whole variety of socioeconomic variables reduces the differential somewhat, but the associations persist nevertheless.

The two most recent surveys that permit examination of differentials by family income are AFPH and NES, the latter referring to a large sample of rural northeastern women. In addition to inquiring about income, AFPH included a question concerning the respondents' perception of their wealth relative to others which permits us to classify respondents according to their perceived relative wealth as well as to their reported annual income. The AFPH results also permit a comparison of income differentials for the rural and urban populations (although urban is limited to provincial towns).

The AFPH results, presented in Table 63, reveal a general inverse relationship between income and total expected number of children in the rural portion of the sample, but a much less regular relationship is apparent for the urban portion. When classified by perceived relative wealth, the inverse relationship for the rural sample more or less disappears while a distinct inverse relationship emerges for the urban sample. It should be kept in mind that there is greater variation in income among the urban population and this is probably reflected in sharper perceptions of differences in relative wealth. Current fertility as reflected in the percent pregnant shows an irregular relationship with annual family income in both the rural and urban samples. However, a positive relationship with perceived relative wealth is indicated for the rural sample while a distinctly negative one is indicated for the urban sample. The positive relationship between current contraceptive use and annual income observed in the earlier surveys is also evident in the AFPH results, although the differentials appear less pronounced and are rather irregular for the urban sample. With regard to perceived relative wealth, there is virtually no relationship with the percent currently using contraceptives for the rural sample, although a direct relationship is evident for the urban sample. Curiously, an association of ever use with relative wealth is virtually absent for the urban sample. Inverse relationships between the preferred number of children for self and both annual family income and perceived relative wealth are evident, although the differences are not large. These differences contract considerably for the rural sample and virtually disappear for the urban sample when the preferred number for a daughter is considered.

TABLE 63 Selected Fertility-Related Variables, by Family Income, Perceived Relative Wealth, and Place of Residence, Standardized for Age, Currently Married Women Aged 15-44, 1979: Thailand

	Total Expected Children		Percent Pregnant		Percent Current Use Contraception		Percent Ever Use Contraception		Preferred Number of Children			
									For Self		For Daughter	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Annual Family Income (in baht)												
Under 5,000	3.97	3.37	11.2	12.0	43.3	50.1	62.2	70.0	3.42	3.15	3.00	2.7
5,000 - 9,000	3.98		11.1		43.7		58.6		3.32		2.90	
10,000 - 14,000	3.80	3.83	8.6	6.2	48.7	41.1	69.3	61.6	3.16	2.95	2.83	2.7
15,000 - 24,000	3.55	3.37	10.0	7.2	47.2	64.6	66.2	80.7	3.16	2.94	2.77	2.6
25,000 - 34,000	3.74	3.43	10.0	10.4	48.1	61.9	64.1	83.4	3.14	2.86	2.71	2.8
35,000+	3.45	3.18	6.8	8.4	55.1	61.3	75.8	78.1	2.96	2.89	2.78	2.7
Perceived Relative Wealth												
Poorer	3.83	3.57	10.3	7.2	46.5	56.8	65.5	74.5	3.28	2.96	2.85	2.6
Average	3.71	3.26	9.8	9.5	47.4	60.3	65.2	77.8	3.19	2.95	2.84	2.7
Wealthier	3.73	3.10	9.2	13.2	49.6	64.0	71.1	75.3	3.10	2.72	2.71	2.6

Note: The age distribution of currently married women for the whole country as reported in the 1970 census was used as the basis of the age standardization.

Source: AFPH.

Results for the NES, presented in Table 64, are striking with respect to the weak differences apparent across income categories for most of the variables. The sharpest differentials seem to be the inverse association between current marital fertility as measured by I_g' and income. No similar inverse relationship is apparent for the percent currently pregnant, although this is undoubtedly an inferior measure of current fertility. Differences in cumulative fertility as measured by children ever born are minimal as are differences in the preferred number of children and the percent wanting no more children. Indeed, the data on fertility desires are remarkable in showing virtually no difference at all across income groups. While there is some evidence of a direct association between contraceptive use and family income, the differentials are very small and contraceptive use rates are rather high even for the lowest income group.

The data on differentials in reproductive behavior and attitudes by income for the four surveys reviewed suggest that income differentials are less marked than educational differentials. The most consistent pattern found was a direct association between contraceptive use and income, although the evidence from the two most recent surveys and particularly the NES suggest that these differences have contracted considerably. Given problems with measuring income as well as comparability in income categories among the different surveys, these findings can only be considered suggestive. Moreover, the NES results refer only to the northeast. Some confirmation is provided by a recent survey conducted in eight rural districts in the northeast, which also found a noticeably weak association between contraceptive use and income class (Grandstaff, 1980). Perhaps most importantly, the data are fairly clear in indicating that all income categories have participated substantially in the reproductive changes that have occurred over the last decade. Hence, both with respect to education and income, Thailand's fertility transition can be considered quite pervasive.

RELIGION

Over 90 percent of the Thai population is considered Buddhist and 5 percent adhere to Islam, the second largest religion. Nevertheless, religious differentials in fertility and related behavior are of interest because

TABLE 64 Selected Fertility-Related Variables by Family Income, Currently Married Women Aged 15-44, Standardized for Age, Rural Northeast, 1980: Thailand

Fertility-Related Variables	Annual Family Income (in baht)					
	Under 4,500	4,500-9,499	9,500-14,499	14,500-24,499	24,500 34,499	34,500 and over
Children ever born[a]	3.7	3.7	3.7	3.8	3.7	3.5
I_g (for 1979)	.55	.47	.45	.43	.43	.40
Percent currently pregnant	9.9	9.0	11.4	9.4	9.0	9.5
Percent current use of contraception	48	49	50	56	52	55
Percent ever use of contraception	59	59	61	67	64	65
Percent wanting no more children	55	56	57	57	57	55
Preferred number of children	3.5	3.4	3.4	3.4	3.4	3.9

Note: The age distribution of ever-married or currently married women, as appropriate, for the whole country as reported in the 1970 census was used as the basis for the age standardization.

[a]Including stillbirths.
[b]Excluding preference for no children due to coding problems in data set.

Source: NES.

cultural differences between Buddhists and Moslems are relatively sharp within the generally homogeneous Thai society. Information on religious reproductive differentials is limited because of the low proportion of Moslems in the population and the consequent small numbers that are included in any national sample survey. Moreover, the Longitudinal Study (LS1 and LS2) purposely excluded the four heavily Moslem provinces in the south and the two Contraceptive Prevalence Surveys (CPS1 and CPS2) do not include information on the respondent's religion, thus effectively precluding analysis of religious differentials from these surveys. Nevertheless, the limited data available from SOFT and from other specialized surveys suggest that Moslems have participated considerably less in the recent reproductive changes that have taken place and represent probably at least one exception to the pervasiveness that otherwise characterizes Thailand's fertility transition.[2] As a result, the somewhat complex pattern of religious differentials in fertility that existed formerly appears to have changed considerably in a relatively brief period of time.

In one of the earlier studies of religious differentials in fertility in Thailand, Goldstein (1970) analyzed the 1-percent sample tabulation of the 1960 census and found substantial differentials between Buddhists and Moslems, with the latter characterized by distinctly lower numbers of children ever born. This finding held for each of the broad age groups analyzed but was considerably more pronounced at older ages. Given that Moslems marry at a considerably earlier age than Buddhists, the lower cumulative fertility is particularly interesting. Goldstein speculated that more frequent divorce and remarriage may account for the lower Moslem fertility rates. He also suggested that poor health may play a part.

Data from the 1970 Rural Employment Survey in southern Thailand, which included questions on fertility and contraception, also indicated that Moslem women had a substantially lower average number of children ever born than Buddhist women by the end of the reproductive span. At younger ages, however, the average number of children ever born was higher for Moslem women, with the crossover in differentials occurring around age 35 (Jones and Soonthornthum, 1971). Information on contraceptive use indicated that prevalence was low for both groups. The authors concurred with Goldstein's view that one possible

source of the religious differentials in completed fertility at older ages was probably higher rates of divorce and separation among Moslems. Unfortunately, their data set lacked adequate information to explore this hypothesis.

Although the number of Moslems included in SOFT was not large, the sample did include several districts in the heavily Moslem provinces of the south and thus there are sufficient cases available to permit at least a suggestive analysis of religious differentials in fertility and to reveal proximate determinants. Data on cumulative fertility and marriage patterns based on SOFT are summarized in Table 65. Since well over two thirds of the Moslem women interviewed were from the southern region, comparisons between Buddhists and Moslems at the national level can be distorted by regional differences. Therefore, results are shown separately for the southern region, enabling comparisons between southern Buddhists and Moslems. The findings on children ever born are consistent with those based on the special 1970 KAP survey, indicating somewhat higher cumulative fertility for Moslem women under age 30 but lower numbers of children ever born for older Moslem women compared to Buddhists. The higher Moslem fertility at younger ages is not surprising in light of the substantially earlier age at first marriage among Moslems. The religious differentials in age at first marriage are even more pronounced when the comparison is limited to the southern region. Although these data on age at first marriage are affected by a truncation bias (as discussed in Chapter 3), and since this bias affects both religious groups, it is unlikely to bias the comparisons very much. While Moslem women marry at an earlier age, they also experience considerably more divorce or separation, as indicated both by the higher percent who are currently divorced or separated and the higher percent who are currently married but who have had more than one husband. Again, these religious differentials are even more pronounced when comparison is limited to the southern region. The higher prevalence of marital dissolution among Moslem women acts in a contrary direction to the younger age at marriage as an influence on cumulative fertility and is a potential explanation for the lower numbers of children ever born found for Moslem women at the older reproductive ages.

Smith's (1981) application of life table techniques to data from SOFT in order to estimate marital dissolution

TABLE 65 Mean Number of Children Ever Born, Mean Age at First Marriage, Percent Currently Divorced or Separated, and Percent Married More than Once, by Religion and Age, Ever-Married Women, 1975: Thailand

Geographical Area and Age Group	Children Ever Born		Age at First Marriage		Percent Divorced or Separated		Percent Married More than Once	
	Buddhist	Moslem	Buddhist	Moslem	Buddhist	Moslem	Buddhist	Moslem
National								
Under 30	1.90	2.41	18.9	16.7	4.6	8.0	5.5	12.1
30-39	4.42	4.25	20.3	17.1	4.6	2.3	13.5	40.8
40+	6.41	5.88	20.2	17.9	4.7	11.7	16.6	41.0
All ages	3.93	3.73	19.7	17.1	4.6	7.8	11.1	25.9
Southern Region								
Under 30	2.15	2.32	19.1	15.9	2.8	11.3	2.5	17.1
30-39	4.54	4.16	21.0	16.2	2.1	2.8	11.0	49.4
40+	6.53	5.74	20.7	17.1	4.0	13.4	19.7	51.6
All ages	4.29	3.66	20.2	16.3	2.9	9.9	10.6	33.8

Source: SOFT.

rates also indicates greater dissolution among Moslems. His analysis controls for educational differentials among the two religious groups by limiting the comparison to women with no more than a primary education. His estimates indicate that 14 percent of first marriages for Buddhists and 32 percent for Moslems dissolve within the first ten years.

Additional evidence on differences in nuptiality patterns by religion are available from an analysis of the 2-percent sample of the 1970 census by Chamratrithirong (1980). His results indicate a singulate mean age at marriage for Moslem women of 19.6 compared to 22 for Buddhist women. Moreover, the percent never married among women aged 40-44 was also lower for Moslem women: no less than 1 percent compared to 4 percent for Buddhists of the same age.

There is some evidence to suggest that a shift may have occurred in Buddhist-Moslem fertility differentials in the course of Thailand's recent fertility transition. Based on a survey conducted in 1980, a study of religious fertility differences in the Jana district of Songkla province in southern Thailand found higher average numbers of children ever born among Moslem women, not only at most younger ages but also at older ages (Porapakkham and Serikajornkitjarean, 1981). Moreover, this study found distinctly lower current marital fertility for Buddhist compared to Moslem women: the I_g' was .35 for Buddhist women and .50 for Moslem women based on births in the year prior to the survey. Measures of current marital fertility by religion are not available for previous studies, but data from SOFT indicate that within the southern region there was no difference in the self-reported rate of pregnancy in 1975; 12 percent of both southern Buddhist and southern Moslem women reported themselves as pregnant at the time of the interview.

There are, of course, problems of comparability between a survey which is based on only one district and other surveys which have drawn from broader populations but are based on small numbers of cases. For example, an I_g' of .42 for both religious groups combined for the Jana district is noticeably lower than the rate for the southern region based on any of the surveys, including CPS2 which took place a year later (see Table 6). Sampling fluctuations and differences in methodology are also potential sources of discrepancies when making comparisons. However, information on religious differentials in contraceptive prevalence found in several surveys over

the last decade and summarized in Table 66 indicates that a substantial gap in contraceptive practice has developed between Buddhists and Moslems.

This gap is of considerable importance given the leading role of contraceptive use among the proximate determinants responsible for Thailand's fertility decline (see Chapter 6). At the start of the 1970s, contraception was practiced by relatively few rural women in the south regardless of religion. While Buddhist couples in the south may lag somewhat behind couples in other

TABLE 66 Percent Currently Practicing Contraception Among Currently Married Women, by Religion, from Selected Surveys: Thailand

Survey and Geographical Area	Buddhist	Moslem
Rural Employment Survey, 1970		
Southern region	9.4	4.2
SOFT, 1975		
All Thailand	41.1	11.9
Southern region	25.8	7.2
Thai Moslem Fertility Survey, 1976		
Five southernmost provinces	--	13.6
Jana District Survey, 1980		
Jana District in southern Thailand		
All methods	46.7	23.0
Excluding withdrawal	31.7	9.0

Notes: Results from SOFT refer to currently married women under age 45; all other results refer to currently married women under age 50. Results from the Rural Employment Survey are reported by the husband and refer to nonpregnant women only. Results for the Thai Moslem Fertility Survey are the average of those reported by wives and husbands.

Sources: Jones and Soonthornthum (1971); Thailand, National Economic and Social Development Board (1978); Porapakkham and Serikajornkitjarean (1981); and unpublished tabulations.

regions in the adoption of family planning, as indicated by results from SOFT, contraceptive practice among them still increased considerably and apparently to a considerably greater extent that for Moslem women. The 1980 results for the Jana district indicate that Moslem women are not only much less likely to be practicing contraception but that a larger share of those who do so report using some nonmodern method, particularly withdrawal, rather than the modern methods practiced by the Buddhists. Examination of the methods reported in SOFT help confirm this finding: close to half of the small number of Moslem users reported some nonmodern method compared to only a very small proportion of all users. While direct evidence on effectiveness of different methods in Thailand is not available, experience from other countries suggests that nonmodern methods such as withdrawal are probably less effective that most modern methods.

Given the low proporation of Moslem women practicing contraception and particularly modern methods, we must look to other proximate determinants as explanatory factors underlying their relatively low fertility in the past. Clearly, marriage patterns and in particular high rates of marital dissolution have played a part. Data from SOFT suggest that religious differentials in breastfeeding patterns may also be of some importance. Table 67 summarizes data on a variety of breastfeeding indexes by religion. While Buddhist and Moslem women resemble each other on a national level, the southern region Moslem women clearly breastfeed their children longer than Buddhist women do. If such differences have been true in the past, this could help account for the lower cumulative fertility characterizing older Moslem women that has been found in a number of studies.

Given the relatively scanty information that is currently available on religious differentials in reproductive behavior, firm conclusions on the extent of the differentials and the proximate determinants underlying them would be premature. However, the results suggest that important differences in proximate determinants do underlie the observed religious fertility differentials. Moreover, it is likely that both the extent and nature of the religious differentials in fertility as well as in the proximate determinants may be changing as Thailand's fertility transition proceeds. The data suggest for example, that religious differentials in contraceptive use may actually be increasing and thus, unlike educational or family income differentials, religious differ-

TABLE 67 Selected Indexes of Breastfeeding by Religion: Thailand

Selected Indexes	National		Southern Region	
	Buddhist	Moslem	Buddhist	Moslem
Estimated Mean Age at Weaning From Percent Still Breastfeeding[a]	18.8	19.0	18.8	22.0
Reported Mean Age at Weaning of Next-to-Last-Born Child	17.2	18.9	17.1	22.0
Percent Reporting Breastfeeding Last-Born Child More than 3 Months[b]	85	80	81	
Percent Reporting Breastfeeding Last-Born Child More than 12 Months[c]	70	71	59	83
Adjusted Percent Still Breastfeeding Last-Born Child Under 3 Years of Age[d]	63	62	64	75

[a]For technique of calculation, see Knodel and Debavalya (1980).
[b]Women whose last-born child was less than 3 months old and was still being breastfed were assumed to breastfeed for at least 3 months.
[c]Based on women whose last birth occurred at least 12 months ago.
[d]Adjusted for number of years since most recent birth by Multiple Classification Analysis (MCA). Women who reported a duration of breastfeeding longer than the open birth interval were coded as still breastfeeding, even though they were not directly reported as such.

Source: SOFT.

entials may become more rather than less prominent in the future.

In short, there seems to be clear evidence that reproductive change has been quite pervasive in Thailand in terms of at least two fundamental social and economic dimensions--education and income. The same is not true, however, in terms of a basic cultural dimension, as represented by religion. The overall demographic impact of the lack of full participation of Moslems in the process of fertility transition is minimal given their small share of the total population. The implications for an understanding of this process, however, may be considerably greater. A search for explanations of the decline of Thai fertility beyond the proximate determinants framework would undoubtedly profit from a fuller understanding of the contrasting paths taken so far by Buddhists and Moslems.

NOTES

[1]In each study, women were classified into four educational categories: no schooling, primary education, secondary education, and university education. The categories of primary and secondary education are not the same. In the 1960 study, primary education included women with 1-4 years of schooling; in 1970, primary education included women with 1-7 years of schooling with complementary differences reflected in the secondary education category. Nevertheless, the results seem to point clearly to an increasing differential by educational attainment. For example, the mean number of children ever born to ever-married women aged 20-44 standardized for age using the 1970 age distribution for all women as the standard, shows the following differentials: If the number of children ever born to women with no schooling is indexed as 100, those with primary, secondary, and university education are, respectively, 99, 82, and 60 in 1960; and 95, 58, and 44 in 1970.

[2]Sharp differentials may also characterize other ethnic minorities, but their small numbers and exclusion from survey coverage generally prevent analysis. Hill tribes in particular may be characterized by considerably higher fertility at present than most of the Thai population, but relatively little reliable information is available for them. Moreover, they are less integrated into the mainstream of Thai society and polity than are the Moslems.

CHAPTER 9

SUMMARY AND CONCLUSIONS

Thailand is among a growing number of developing countries that have moved in recent years from an early stage of demographic transition characterized by falling mortality in the presence of high, relatively stable fertility to a later stage in which fertility has also started to decline. In Thailand this progression has been both recent and rapid. Although reliable statistics on mortality and fertility for earlier periods are lacking, the evidence available suggests that mortality has been declining since the early decades of this century with a probable interruption associated with the events of the Second World War. It is also difficult to date the onset of the fall in fertility with precision. Most evidence indicates that the fertility decline started to gain momentum only during the 1960s and, for the rural population, probably dates largely from the latter part of that decade.

A decomposition of changes in the crude birth rate between the mid-1960s and mid-1970s suggests that changes in the age structure and in the proportion married among women in the reproductive ages probably acted in counter-balancing ways and that neither was an important contributor to the changes in the crude birth rate. A modest increase in the proportions remaining single among women in the younger reproductive ages seems probable and thus helped to lower the birth rate; minor changes in the age structure probably had the opposite influence. Thus the recent decline of fertility in Thailand is predominantly a matter of reduced childbearing within marriage.

Between the late 1960s and the early 1980s, survey evidence indicates that marital fertility fell by almost 40 percent, representing one of the most rapid fertility transitions in the developing world. This reduction in

marital fertility is supported by data showing decreases in the percentage of women who are currently pregnant and increases in the average length of the open birth interval. Reductions in the expected number of children during the last decade both reflect the continuing fertility decline and, especially among younger married women, imply continuation of the recent fertility trends, at least for the near future. By 1981, the average expected family size among married women under age 25 had fallen to levels closer to two children than to three children and is only about half as large as the average number of living children among women currently reaching the end of their childbearing years. Moreover, it is approximately one child or so less than implied by the current total fertility rate.

One of the most striking features of Thailand's recent fertility decline has been its pervasiveness. Almost all major divisions of Thai society have participated. During the last decade or so, fertility decline appears to be even more pronounced in rural than in urban areas, thus narrowing the former substantial rural-urban differential in fertility levels. While regional differences have been apparent in both the timing and extent of decline, all areas of Thailand had at least started to participate in the fertility transition by the early 1980's. Moreover, fertility differentials by educational attainment and family income are minimal, reflecting the full participation of the least educated women and the poorest couples in the move toward smaller families. One group, however, that appears to be relatively resistant to the changing reproductive patterns is the small Moslem minority, many of whom live in southern Thailand, the most laggard region in terms of fertility decline. Since Moslems constitute only a very small proportion of the total population, their impact on national trends is minimal. The fact that Thailand's reproductive revolution encompasses such a broad social and economic spectrum may be related to the relative cultural homogeneity of Thai society. The exception of the Thai Moslems tend to confirm the importance of cultural rather than socioeconomic barriers to reproductive change in the case of Thailand. A fuller understanding of the source of the religious differentials may help clarify those features of the dominant Buddhist population that have made it so receptive to reducing fertility. This is an area of investigation that deserves more attention.

The focus of much of this study has been the proximate determinants of fertility: those variables that directly link childbearing to all other influences, whether socioeconomic, cultural, or environmental. In our review of the proximate determinants we have divided them into three sets: factors influencing exposure to intercourse, natural marital fertility factors, and deliberate marital fertility control factors.

In Thailand, exposure to intercourse is largely a matter of family formation and dissolution, since most reproduction occurs within the context of marriage. Only scattered evidence is available on the extent of premarital sexual activity and illegitimacy. In rural areas, at least, premarital intercourse can lead to pressure to marry, especially when discovered by the young woman's parents. Methodological problems, however, prevent accurate estimates of the extent of premarital pregnancy being drawn from survey data currently available. Even less is known about the extent of illegitimacy, but it seems safe to conclude that extramarital births are not an important contributor to fertility overall.

Entry into marriage occurs, on average, in the early twenties for women and two or three years later for men. Age of marriage apparently has been increasing slowly since the Second World War, although not all information is consistent in this respect. For both men and women, marriage is close to universal, with only a few percent remaining single throughout the reproductive age span. At the same time, marital dissolution as well as remarriage are fairly common. Thus, a substantial minority of both men and women are married to someone other than their first spouse by the time they reach the end of the reproductive ages. Because remarriage is common and rapid, only a small amount of exposure time to childbearing is lost by women as a result of marital dissolution during the reproductive span. Some exposure time is also lost through the separation of spouses due to temporary migration, but again this is unlikely to be an important influence on fertility except perhaps in some special local circumstances.

Exposure to sexual intercourse is relevant to fertility, of course, only during the ages when men and women are biologically capable of reproducing. Thus some attention has been given in the present study to determine the biological age limits of reproduction. A review of studies with information on the onset of the menarche suggests that it is probably later in Thailand than in

most of the more developed countries. At least until recently the mean age has been perhaps as late as between 15 and 16 for large segments of the population. There is some limited evidence suggesting that the average age of menarche has declined in recent decades and also that an inverse association exists between socioeconomic status and age at menarche.

Less information is available on menopause in Thailand. One study of questionable quality suggests that it increased over the last few decades. Prior to the widespread practice of contraception, the mean age at last birth among women past the childbearing age was in the late thirties, which is within the usual range for natural fertility populations.

Other factors examined that could affect marital fertility independent of deliberate efforts at birth control were primary sterility, coital frequency and lactational infecundability. Primary sterility appears to be quite low: only a few percent of ever-married women at the end of the reproductive ages reported themselves as childless.

A variety of studies have collected information on coital frequency, but often the samples are quite specialized and the questions and methodology not comparable. As might be expected, these studies indicate an inverse association with age. The mean frequency of intercourse indicated by these studies ranges from slightly over one to close to three times per week.

Breastfeeding in Thailand is practiced close to universally, especially in rural areas. During the last decade or so, a moderate decline in the average duration has taken place, although still more than half of Thai women breastfeed for over one year. Supplemental food is introduced at an early age and probably reduces the potential inhibiting effect of the relatively long durations of breastfeeding on fertility. The median duration of postpartum amenorrhea, and hence the post-partum nonsusceptible period, is currently estimated at just under five months. Presumably, the decline in the duration of breastfeeding has operated against the prevailing trends toward lower marital fertility.

The most important proximate determinants responsible for the recent decline in Thai fertility have been those associated with deliberate marital fertility control, particularly contraception. There exists substantial information to document the relative absence of knowledge of effective birth control methods in the past, with the

possible exception of traditional techniques of abortion. However, contraceptive knowledge has increased rapidly in recent years to a point where it is now close to universal among married women. The practice of contraception has increased dramatically as well. At the end of the 1960s, less than 15 percent of married women in reproductive ages reported using some method of contraception; by 1981, this had increased to close to 60 percent. As with fertility decline, the increase in contraceptive use has been pervasive. Rural-urban, educational, or income differentials in contraceptive use are small at present. Moslem women are among the few identifiable groups that have lagged noticeably behind in their adoption of modern methods of birth control.

Only limited information is available on the practice of induced abortion. The scattered evidence that does exist suggests that it is relatively common despite the fact that many Thais express an overt disapproval of abortion, which they view as contrary to the precepts of Buddhism. The very scarce evidence also suggests that the practice of abortion has increased during much of the same period that contraceptive use has been on the rise. Most likely, both abortion and contraception have been used by Thais in meeting their increased desires to limit family size.

We have applied an analytical accounting scheme developed by John Bongaarts to data for Thailand in order to estimate the contribution of four principal proximate variables--proportions married, contraception, abortion, and lactational infecundability--to the level and change in Thai fertility during the recent period of fertility decline. The results indicate that the most important inhibitor of potential fertility during the late 1960s was the marital structure of the population. Lactational infecundability was the second most important factor, and contraception and induced abortion were relatively unimportant. By the end of the 1970s, however, contraception had clearly emerged as the most important inhibitor of potential fertility, followed by the marital structure, with more modest contributions being made by lactational infecundability and induced abortion. A decomposition of the fertility decline during the intervening decade indicated that reduced breastfeeding would have led to a 20-percent increase in total fertility had changes in the other proximate determinants not counteracted it. In contrast, changes in the proportion of women married and in induced abortion has contributed

modestly to the reduction in total fertility. By far the major factor accounting for the fertility decline has been the rise in contraceptive practice. Its contribution to fertility change during this period has been far greater than all other proximate determinants combined.

Why the fertility transition occurs where and when it does is a question that has intrigued social scientists and policy makers for decades. In the present study, we have made no systematic attempts to analyze the causes underlying the fertility decline in Thailand outside of the proximate determinants framework. We have pointed to evidence suggesting that the National Family Planning Program sponsored by the government has probably facilitated the rapid changes that have taken place. The development of an active program corresponds closely with the timing of the fertility decline in rural areas, a vast majority of Thai women report receiving their contraceptive supplies or services through the program and the analysis of service statistics indicates that the number of estimated births averted through the program can account for most of the observed fertility decline during the period under observation.

Regardless of how much of an impact the program has had on facilitating the fertility decline, a broader question arises as to why such a large proportion of Thai couples have been so receptive to adopting contraception and reducing their fertility in such a short period of time. The answer does not seem to be on the level of socioeconomic development, at least as conventionally defined, since even now the Thai population is overwhelmingly rural and agricultural. The full participation of couples with widely different socioeconomic backgrounds also suggests that the link to socioeconomic variables may be relatively weak. We suspect the pace of change is related to the cultural context in which it is occurring and to the rapid expansion of the communication and transportation network that now permeates virtually the entire country.

The rapid expansion of communication and mass transportation in recent decades is dramatic. Transistor radios are virtually a universal possession and televisions are becoming increasingly common even in the countryside. Minibuses and the extended road systems have also played a significant part in reducing the isolation of village life. Rural and urban Thais, the lesser and the better educated, the poor and the rich are all now exposed to a wide range of modern fashions,

consumer goods, and lifestyles. In response, aspirations, tastes, and attitudes have probably changed in a way that is incompatible with uncontrolled, high fertility. Coupled with an increased awareness that childbearing can be a matter of deliberate choice and with increasing local availability of contraception and perhaps abortion, these changes have led to rapid fertility decline. This occurred without large portions of the population moving to urban areas or working in the modern sector. Moreover, those shifts in socioeconomic structure that did occur surely further reinforced the newly emerging reproductive attitudes and behavior.

We also suspect the pace of decline has been facilitated by certain aspects of the Thai cultural context, in particular the Buddhist outlook on life and the position of women in Thai society. Buddhism as practiced in Thailand emphasizes that each individual is responsible for his or her own salvation and undoubtedly contributes to the general tolerance often associated with Thai culture. Religious opposition to contraception is virtually nonexistent. Attitudinal data clearly point to a widespread acceptance of the concept of birth control and family limitation. The permissiveness of Buddhist culture may well contribute to the relative ease with which modern tastes, attitudes, and behavior, including the modernization of reproductive patterns, are taking hold. Moreover, women in Thailand have traditionally experienced relative social and economic freedom. As a result, they are linked along with Thai men to the modern communication networks. Thus in various and increasing ways, even women in the rural hinterlands are exposed to the ideas and lifestyles that characterize urban centers and the world beyond. Since most of the contraceptive practices that have been responsible for the reduction of fertility in Thailand are female methods, and since the physical burden of childbearing and much of the burden of childrearing is borne by women, their exposure to the modernizing forces that are at work can and probably did have a strong impact on fertility.

There is substantial evidence to suggest that the fertility decline in Thailand is still in process. Declining family size preferences and expectations reinforce the impression that Thailand's fertility transition will continue for at least some years to come. The modal desired family size is now two children; the majority indicate a preference for a two-child family. Since very few Thais indicate a desired family

size of less than two, this may well set a limit on the extent to which fertility will decline in the intermediate future. In addition, the dominant preference for at least one child of each sex may also contribute to establishing a lower limit to the present fertility transition. Nevertheless, there is still considerable room for fertility to fall before these constraints will become major influences.

APPENDIX

DESCRIPTION OF SURVEYS AND SAMPLES

Much of the analysis of the present study relies on results from a series of national sample surveys conducted between 1969 and 1982. In this appendix, a brief description is provided for the surveys that served most frequently as data sources.

The National Longitudinal Study of Social, Economic, and Demographic Change (LS1 and LS2)

The Longitudinal Study, as it is usually referred to, was conducted by the Institute of Population Studies, Chulalongkorn University. It actually consisted of a total of four separate surveys done in two rounds. Interviews were conducted in a sample of rural households in April and May, 1969 and in a sample of urban households a year later. These two surveys make up the first round of the study and are referred to jointly in the present study as LS1. The second round of the study consisted of reinterviews as well as additional new interviews for the rural sample in April and May, 1972 and for the urban sample a year later. Together they comprise LS2. Both ever-married women and household heads (predominantly male) were interviewed in both rounds.

Sampling procedures and characteristics of the sample have been described in detail elsewhere (Prachuabmoh et al., 1973; Prachuabmoh et al., 1972; Institute of Population Studies, 1971). In both rounds of the Longitudinal Study, the urban population was defined as living within officially designated municipal areas and the rural population was defined as living outside these areas. The rural sample included 45 villages in 15 districts. The urban survey included 32 sample blocks in Bangkok-

Thonburi (the capital and only metropolitan area) and 24 sample blocks in provincial towns. This reflects the fact that well over half of the urban population resides in the capital. The villages and city blocks covered were identical for both rounds with the exception of three villages that had to be dropped from the rural sample because of antigovernment activities. In order to preserve the cross-sectional nature of the second round, these villages were replaced by three other villages in another district in the same province. For all other villages or blocks, houses selected in the first round sample were retained in the second round. In addition, a selection of new respondents was also interviewed to compensate for loss to follow-up and growth in the number of households between the two rounds. Thus the second round samples were designed not only to allow for longitudinal analysis but also to preserve the cross-sectional nature of the samples.

Results for the country as a whole can be approximated by combining the results of the rural and urban phases of each round. Since different sampling fractions were used to select the rural and urban samples, it is necessary to appropriately weigh the results of each sample when combining them. This is accomplished by assigning the urban sample a weight of one and the rural sample a weight of seven. No account is taken of the fact that for each round the rural and urban phases occurred one year apart, but this should be borne in mind when interpreting the results.

Survey of Fertility in Thailand (SOFT)

In 1975 the Survey of Fertility in Thailand (SOFT) was conducted under the auspices of the World Fertility Survey. Responsibility for the survey was shared jointly by the Institute of Population Studies at Chulalongkorn University and the National Statistical Office. Both ever-married women and household heads (mainly male) were interviewed. The bulk of the interviewing of SOFT took place during April and May, 1975. The sample consisted of over 4,000 households in both rural (nonmunicipal) and urban (municipal) areas selected from 267 clusters (234 villages in 78 districts of 34 provinces, 4 rural districts that are part of the Bangkok metropolis, and 29 urban blocks, 14 of which were in Bangkok). The result was approximately an equal probability national sample.

In the processing of results from SOFT for the present report, sample clusters were weighted to compensate for small original deviations from equal probability and also for differential nonresponse. A detailed description of the sample design and survey is available from the first country report (Institute of Population Studies and National Statistical Office, 1977).

The Contraceptive Prevalence Surveys (CPS1 and CPS2)

The National Institute of Development Administration (NIDA), in collaboration with the Family Health Division of the Ministry of Public Health in Thailand, conducted two Contraceptive Prevalence Surveys under contract with Westinghouse Health Systems. Fieldwork for the first survey, CPS1, took place November, 1978 through January, 1979. A detailed description of the sample and methods is provided in the final report of the results (Suvanajata and Kamnuansilpa, 1979). The simple, straightforward questionnaire used was designed to provide information that would assist family planning program administrators in determining the progress of family planning efforts. It thus differed in purpose and to some extent in content from the other surveys due to its more "applied" orientation. In addition, unlike the other surveys, single as well as ever-married women were interviewed. The total sample consisted of 4,025 women (including 1,032 single women). The rural portion of the sample was selected by procedures parallel to those used to draw the SOFT sample. A major concern in drawing the rural sample was to increase conparability with SOFT. Thus the provinces selected for the CPS sample were drawn from the list of 34 provinces included in the SOFT rural sample (excluding Bangkok). From each of the selected provinces, one district was drawn from those included in SOFT and the other was independently and randomly selected from the districts not included in SOFT. The final rural sample consisted of women from 136 villages located in 34 districts of 17 provinces.

The urban portion of the CPS sample was drawn entirely from the Bangkok metropolitan area. It thus differs in two ways from the urban samples of the other surveys. First, it excludes provincial urban areas from the sample. Second, it treats the entire Bangkok metropolitan area as urban while in the other surveys parts of this area are considered rural and are included in the rural portion of

their samples (since officially, some parts of the Bangkok metropolitan area are classified as nonmunicipal areas). The proportion of the total CPS sample that comes from the Bangkok metropolitan area is approximately equal to the proportion of Thailand's population that live in areas officially classified as urban (including provincial urban areas). Examination of results suggests that the use of a sample from the Bangkok metropolitan area in CPS to represent the entire urban population of Thailand has little effect on the representativeness of the sample on the national level. Comparison of results from the urban sample of CPS with those from the urban samples of the other surveys, however, is more hazardous and potential incomparability should be borne in mind when interpreting findings.

The second Contraceptive Prevalence Survey (CPS2) was conducted in 1981 from March through June with interviewing concentrated in April and May. The sampling procedures employed in CPS2 were designed to yield a self-weighting nationally and regionally representative sample. As with CPS1, the questionnaire had a more "applied" orientation so that the information collected would be more directly useful for the National Family Planning Program. Unlike CPS1, the sample of CPS2 covered only ever-married women. A detailed description of the sample and methods is provided in the country report (Kamnuansilpa and Chamratrithirong, 1982).

The total sample of CPS2 comprised 7,038 ever-married women aged 15-49. Multistage sample techniques were employed to select both rural and urban sample phases. The procedures used to select the rural portion of CPS2 sample paralleled those in CPS1 (which in turn was drawn from the list of 34 sample provinces in SOFT). In addition to the 17 provinces covered in CPS1, seven more provinces were randomly selected with probability proportional to size from the remaining provinces. Two districts were selected from each of the sample provinces. One of the two districts in each of the 17 provinces covered in CPS1 was randomly selected from the two districts covered in the first round, while the other was randomly selected from the remaining districts. Next, in each selected district, two sub-districts were drawn. Again, in the provinces which were also selected in CPS1, one of the two sub-districts was the same as the first round. In the new provinces, each sub-district was new. In the next step, two villages were randomly selected from each sub-district drawn in the previous stage. In

the sub-district which was selected in the first round, the two villages were the same as in the first round. The final rural sample of CPS2 consisted of 5,823 ever-married women from 192 villages of 96 sub-districts, 48 districts, and 24 provinces.

The urban sample of CPS2 was drawn from the Bangkok metropolitan area and provincial municipal areas separately. Thus, the urban portion of CPS2 unlike that of CPS1, is representative of all of urban Thailand and not just the Bangkok metropolitan area. Interviewing yielded a total of 765 respondents in the Bangkok metropolitan area and 450 in provincal urban areas.

The National Survey of Family Planning Practices, Fertility and Mortality (NS)

The National Survey was conducted in 1979 by the Institute of Population Studies, Chulalongkorn University, with interviewing concentrated in April and May. A description of the sample and methods is available in the summary report (Institute of Population Studies, 1981). The definition of rural and urban in the NS was in terms of municipal and nonmunicipal areas. The sample was somewhat unusual in design as it attempted to draw part of its respondents from the villages or city blocks included in the earlier LS2 samples and part of the respondents from new sample areas. In those LS2 sample areas selected, an attempt was made to reinterview former respondents from the previous survey. Some, but not all, of the villages and blocks, that had been part of the LS2 sample, as well as a number of new villages and blocks, were included. In the LS villages, lists of LS2 households were used in order to locate households with previous respondents. The sample design was such that in most LS villages all of the LS2 households should have been interviewed but attrition through death and migration had reduced the number, and these households were replaced through the sampling of reserve LS villages in different districts or provinces. The NS sample design also called for interviewing a number of new households in some of the LS villages, plus the new households interviewed in the new sample areas selected for the NS. In the urban LS areas the sampling fraction was much smaller than that used in LS2, with the result that only a relatively small proportion of the former LS households was selected for reinterview. For this reason, there was no need to select

new households in the urban LS areas and the small number recorded in this category was comprised of new households living in houses formerly occupied by LS2 households.

As a substantial portion of the sample is made up of households purposely selected because they took part in LS2, the NS sample does not provide a representative cross-section of the current national population. One result of the sampling procedure is a skewed age distribution, as members of LS2 households tended to be older than the average. Thus, among ever-married women in the reproductive ages, those at older reproductive ages are somewhat overrepresented relative to younger women.

The total NS sample consisted of 2,579 households: 2,144 in rural areas and 435 in urban areas. The sample covers 60 rural villages in 21 districts of 18 provinces (8 villages, while officially rural, are within the boundaries of the Bangkok metropolis). The urban portion of the sample derives from 56 blocks of which 32 are located in Bangkok and the remainder in 13 provincial towns. The rural and urban portions of the sample were self-weighting. Both household heads and ever-married women were interviewed.

The Accelerated Family Planning and Health Project Baseline Survey (AFPH)

Unlike the other surveys described so far, the AFPH survey was undertaken in conjunction with an action project and intended specifically to provide baseline information to be used as part of an effort to evaluate the impact of the project. Results are to be compared with those from a second survey in order to make a "before and after" type comparison. The project being evaluated is the Accelerated Family Planning and Health Project sponsored by the World Bank. The project is designed to accelerate the expansion of family planning and rural health services in 20 selected provinces that are characterized by low-to-moderate family planning acceptance, high population densities, and poor health facililty coverage and thus believed to require special attention.

Since the sample was drawn only from these 20 provinces, it clearly is not representative of all of provincial Thailand. Nevertheless, a sufficient number of provinces were covered to make it of interest. To help gauge how the 20 provinces differed from the total number of provinces, the table below presents a

comparison of the unweighted average of a selected number of indicators for the 20 provinces and for all provinces excluding Bangkok.

Mean of the Selected Provincial Measures	20 Provinces	All Provinces Except Bangkok
Percent of population in metropolitan areas, 1979	6.5	8.7
Electric consumption per capita	15.1	15.2
Percent of women aged 15-29 with 5+ years of school, 1970	7.7	10.8
Female literacy rate, 1970	74.2	72.4
Gross provincial product per capita, 1975-79 at 1972 constant prices (in baht)	3,980	5,463
Estimated continuing contraceptive users from National Program per 100 married women in reproductive ages, 1978-80	39.7	44.5
Percent of households with a radio, mid-1970s	66.6	65.7
Percent of households with a TV, mid-1970s	2.3	3.6

Currently married women in the reproductive ages (almost exclusively under 45) were interviewed in urban and rural areas of all 20 provinces. Fieldwork took place in October and November, 1979. A total of 750 urban women and 2,239 rural women were included. Since different sampling fractions were used to select the urban and rural samples, results presented for the total sample in this study have been weighted appropriately.

CONCLUDING COMMENTS ON SAMPLES

Because of the unusual age distribution of the NS sample and, to a lesser extent, because of differences in the age distribution of women in reproductive ages included in the other samples (see Debavalya and Knodel, 1978), it is useful to control for age when comparing results across surveys. This is done in the present study through age-standardization, using the age distribution of women as reported in the 1970 census for the whole country as the standard.

Several additional points regarding the samples should be stressed, as they bear on the comparability of results across surveys. In LS1, LS2, and NS, some districts were excluded from the sampling universe for various reasons. The excluded areas encompassed the four predominantly Moslem provinces of the south of Thailand and some districts in politically sensitive areas when it was judged that the safety of the interview teams might be in jeopardy. The areas excluded contain around 20 percent of the rural population and around 5 percent of the urban population. Their exclusion may affect some of the study results and their compatibility with the results from SOFT, CPS1, and CPS2, because the excluded rural areas are generally more isolated than the included areas and thus less exposed to the forces of modernization currently at work in Thailand. An even more serious problem exists for comparisons between the AFPH results and those of other surveys for the reasons discussed above.

A second point concerns sample size. Since the data from the surveys are derived from samples, the results necessarily incorporate some degree of sampling error and only approximate national parameters. Particular note should be taken of the fact that the size of the urban parts of the SOFT, CPS, and NS samples are considerably smaller than either the rural parts of those surveys or the rural and urban samples of the LS. In the latter, a

much larger sampling fraction was used for the urban sample than for the rural sample to compensate for the fact that less than 20 percent of the Thai population lives in municipal areas. There was no similar compensation in the other samples.

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