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**Stalls in the Fertility Decline  
in Costa Rica, Korea, and Sri Lanka**

Murray Gendell

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Murray Gendell

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## FOREWORD

This paper is one in a special series of World Bank Staff Working Papers on population change and development. Prepared as background papers for the World Development Report 1984, they provide more detailed treatment and documentation of the issues dealt with in Part II of the Report. The papers cover a range of topics, including the effects of population growth and change on economic development, the determinants of fertility and mortality, the links between population growth and internal and international migration, and the management, financing, and effectiveness of family planning programs. They include several country and regional studies of fertility change and population policy.

The background papers draw on a large number of published and unpublished studies of individual researchers, on Bank policy analysis and research, and on reports of other organizations working on population and development programs and issues. The papers are the work of individuals and the views and interpretations expressed in them do not necessarily coincide with the views and interpretations of the Report itself.

I hope these detailed studies will supplement the World Development Report 1984 in furthering understanding of population and development issues among students and practitioners of development.

Nancy Birdsall  
Staff Director  
World Development Report 1984

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## Abstract

This study seeks to answer two questions. Are there developing countries in which the decline in fertility was rapid but then decelerated greatly or stopped altogether for a period of at least five years at a level well above replacement? If there are, what are the reasons for such a stalling of the decline? The number of developing countries is limited in which such a stall has occurred, and for which the kind of data, of good quality, needed to answer the second question are available.

In the three countries studied, the total fertility rate began a sustained rapid decline during the 1960s. (In Sri Lanka the decline may have begun during the 1950s.) In all three the declines began to stall around 1975. The Republic of Korea, the only one of the three countries studied in which two stalls occurred, experienced an earlier stall during the period 1967-72 inclusive. Moreover, while the total fertility rate levelled off during the late 1970s in Costa Rica and Sri Lanka, it continued to fall in Korea, but at a much slower pace than during the previous declines. The stalls of the late 1970s had not ended as of 1980-82, the most recent year for which data are available.

The explanations of the stalls are partial, and they differ from one country to the next. In Costa Rica, marital fertility and contraceptive use levelled off, apparently as a result of a convergence between (1) desired and actual fertility and (2) a weakening of the family planning program, as the initial enthusiasm and political support waned.

In Korea, at least some of the reasons for the near levelling off of the total fertility rate during the late 1960s seem to be evident. But the explanation for the acceleration after 1975 is not. During the earlier period, an increase in marriage among women 30-49 years old, as well as an increase in marital fertility of those under age 30, offset declines in marriage among women 15-29 years old and in the marital fertility of women age 30-49. The rise in the marital fertility of younger women is accounted for by a sharp decrease in the first three birth intervals, resulting from increases in premaritally conceived first births (associated with a shift from arranged to romantic marriages), declines in the duration of breastfeeding, and an apparently growing desire to terminate childbearing early. The increase in contraceptive use decelerated markedly during the late 1960s.

During the late 1970s in Korea, the marital fertility of women 25-29 years old increased a bit, reversing the moderate decline of the early 1970s. Among wives 30-34 years old, fertility continued to fall during the late 1970s, but at less than half the rate of the early 1970s. By the late 1970s, childbearing had become so concentrated that almost half the total fertility rate was accounted for by the birth rate of women aged 25-29, and about two-thirds by women aged 25-34. The increase in contraceptive use decelerated during the late 1970s and early 1980s (especially the latter period), after the acceleration of the early 1970s. But the reasons for these changes have not been identified.

The explanation for the fertility stall during the late 1970s in Sri Lanka is also quite limited. There was a large increase in contraceptive use between 1975 and 1982. At least some of the fertility-depressing effect of this increase presumably was offset by an increase in marriage, which seems to have begun prior to 1978, when economic conditions improved considerably, apparently strengthening the rising trend of marriage. There may also have been a reduction in the long duration of breastfeeding which had been practiced in Sri Lanka (thereby tending to increase fertility), but the evidence is too meager for one to be confident that such a decline actually occurred.

#### Acknowledgements

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## INTRODUCTION

This study seeks to answer two questions. Are there less developed countries in which the decline in fertility was rapid but then decelerated greatly or stopped completely for a while well above the long-run replacement level? If there are, what are the reasons for the stalling of the decline? Given the urgency today of reducing fertility rapidly in many developing countries (LDCs), the stalling of a rapid decline evokes concern. Knowledge of the causes of stalls may help end the stalls that have occurred and reduce the risk of their occurrence in countries which have not experienced them. Such knowledge is not readily available, partly because stalled fertility has become an issue only recently. This study, then, is an early effort to close this gap in our knowledge of fertility dynamics.

Analyses of stalled fertility may proceed by case studies or by comparison. It would be desirable to use both approaches. Limited resources, however, precluded doing both in this instance. It was decided, therefore, to do case studies. The knowledge gained from them, it was felt, may be helpful in designing a subsequent comparative analysis. The case studies have been done through a synthesis of information provided in the existing literature.

In dealing with the first question--whether rapid fertility decline has stalled in any less developed country--it was necessary to specify an operational definition of a "stall." The following criteria were chosen:

1. Only those LDCs should be considered in which the total fertility rate (TFR), a measure of fertility that, unlike the crude birth rate (CBR) is independent of the influence of a population's age-sex structure, fell from a high level (TFR > 5.0) by at least 20 percent.

2. The decline should have been rapid, defined as a fall in the TFR averaging at least 0.15, preferably 0.20, of a point per year for a period of at least five years. Thus, a drop in the TFR averaging 0.2 of a point per year for 10 years would reduce the TFR from, say, an average of 6.5 children per woman to 4.5. The analysis of stalled fertility was limited to cases in which fertility decline prior to the stall was rapid because the change from decline to stall was more abrupt in such instances than in cases of a slower decline, and the greater abruptness of the change, it was assumed, would make it easier to detect the reasons for the stall.

3. As for the stall itself, it was hoped that there would be cases in which a rapid decline was followed by a period of no decline at all. If not, cases of substantial deceleration (i.e., a rate of decline no more than half, and preferably much less, of the rate during the preceding period of rapid decline) would be examined. How long should the period of deceleration or levelling off last? There was little on which to base a decision, but it was decided to limit, if feasible, the analysis to cases in which the stall lasted at least five years (with perhaps four acceptable), even if the stall subsequently ended.

4. Cases in which the fall in fertility had brought the TFR close to the long-run replacement level would be excluded. Depending on the mortality level, the replacement level of the TFR is likely to be in the range 2.0-2.5. At this level, one would normally expect little further decline in fertility. Moreover, replacement level fertility is usually the goal of efforts to reduce fertility. Hence, there is more urgency in identifying the reasons for a fertility stall in countries with a TFR well above replacement than in those where it is at or close to replacement.

Applying these criteria, a number of candidates were identified. Not all of these were suitable, however, for either the amount, kind, or

quality of information available to us was too limited. In addition to annual data on the trend in fertility (the CBR and the TFR), data were also needed regarding marriage patterns, marital fertility, family planning programs, family-size desires, and contraceptive use. Additional information about abortion and breastfeeding would be quite helpful, but given their scarcity, their availability was not made a necessary condition.

#### Analytic Framework

There is no generally accepted theory of fertility dynamics. There are, instead, a large number of hypotheses about a variety of ostensible determinants. In addition, there are many models or frameworks of fertility determinants depicting their relations to each other and to fertility. These encompass biological, social, economic, cultural, and psychological factors, though usually not all in the same model. This situation makes it difficult to decide how to organize a study of fertility change. There has, however, come to be increasing acceptance of a scheme that encompasses what are regarded as the most important "proximate" determinants (Bongaarts 1983). This scheme is based on the process of reproductive physiology, with its sequence of conception, gestation, and parturition. Schemes identifying classes of factors that influence the degree of exposure to the risk of conception, the probability of conception, and the continuation of gestation have been developed. Bongaarts (1983) has presented empirical evidence that most of the variation in levels of fertility among populations can be accounted for by four variables: the proportion married, contraception, induced abortion, and postpartum infecundability. ("Fecundability" is defined here as the probability of conception.) Aside from a very short period after birth during which ovulation does not occur, the main factor reducing the probability of conception in the absence of contraception is breastfeeding.

If these four proximate determinants are the most important ones, as the available evidence indicates, then other factors must exert their influence mainly via their impact on them. Thus, once the impact that the four major proximate determinants have had on the decline in fertility has been identified, efforts to measure the influence of such factors as social and economic change can be made by taking social and economic factors as the independent variables and the four proximate determinants as the dependent variables. No systematic attempt has been made to do this in this study, again because of the constraints of time and resources. Nevertheless, when information has been readily available about the significant impact of such factors, it has been included in this report.

Thus, the core of the analytic framework used in this study consists of the four major proximate determinants. It should be noted, however, that since an important determinant of the proportion marrying, especially during the early years of a woman's reproductive period, is the age at marriage, data on the latter are included in the analysis. Also, to help assess the influence of variations in age at marriage and the proportion marrying, marital fertility is compared with the fertility of all women. Similarly, because of their presumed close connection with the use of contraception and abortion, and their frequent availability in fertility surveys, data on preferences regarding the number and sex of children and on the availability of birth control services and materials have been included.

Finally, in measuring the decline in fertility, data on the CBR, as well as the TFR, have been reported. Though the TFR is analytically a better measure of fertility, the CBR is important because of its direct relevance for the rate of population growth. The TFR is a better measure because it is not influenced by changes in the proportion in the population of women of reproductive age, whereas the CBR is. Consequently, the CBR may change at a

different rate than the TFR. When the CBR declines more rapidly than the TFR, it implies that the proportion of women of reproductive age has been declining. On the other hand, when this proportion increases, the CBR declines more slowly than the TFR. The age structure effect on the CBR is limited, but within its limits it can and does cause significant changes. It is helpful, therefore, to pay attention to the impact of changes in the proportion of reproductive-age women in the population, as well as to the other factors noted above.

The three countries chosen for this study are Costa Rica, the Republic of Korea, and Sri Lanka. They meet the criteria for a stall; the quantity and quality of the requisite data about them are reasonably good; and they have diverse cultures and social systems. Within the constraint imposed by the criterion concerning the pace of decline, there are significant variations in the rates of their fertility decline. In sum, they appear to offer a good opportunity for a productive exploratory analysis of stalls in fertility declines.

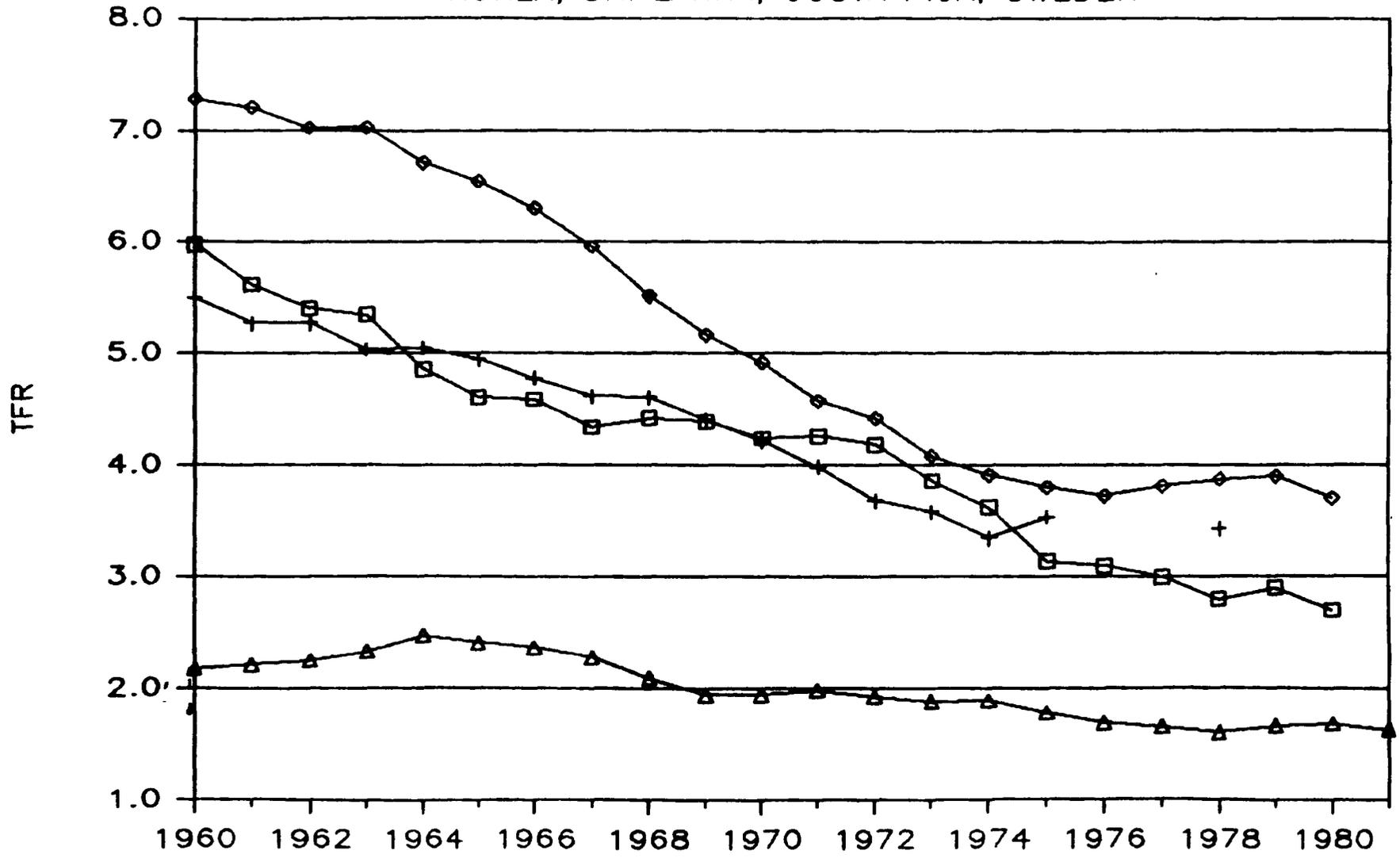
The variations among the three countries in the extent and pace of the fertility decline (as measured by the TFR, which is the sum of the age-specific birth rates) may be seen in Figure 1. The TFR was much higher (over 7 children per woman, on average) in Costa Rica in 1960 than in Korea (6.0) and Sri Lanka (5.5). The drop in Costa Rica was swifter than in the other two countries, and by the early 1970s the three TFRs differed by less than 0.5. By then, the first stall in Korea, which had occurred from 1967 through 1972 at a TFR of about 4.3, had ended, and another period of rapid decline, similar to that of the early 1960s, took place. By 1976, however, the pace of that fall had slowed greatly, and a small, gradual decline ensued through 1980. In each of Costa Rica and Sri Lanka, however, only one stall occurred, beginning about 1974 and lasting through the remainder of the

decade. In Costa Rica, the TFR stalled at about 3.8, while in Sri Lanka, it seems to have done so at about 3.5.

The trend of the TFR in Sweden during the same period has been included in the figure in order to show how great the difference was between the fertility of these three countries and that of a low-fertility country. The comparison also helps bring out how much the gap between them has been narrowed and how much remains. It should be noted, however, that the Swedish TFR fell below the long-run population replacement level by the late 1960s and that it continued to fall (even if slowly) during the 1970s. Hence, its level in the late 1970s should not be viewed as a feasible target for these three developing countries (or any developing country). More realistic would be the replacement level, which would be about where Sweden's TFR was during most of the 1960s.

# TOTAL FERTILITY RATE

## KOREA, SRI LANKA, COSTA RICA, SWEDEN



] KOREA                      + SRI LANKA                      ◇ COSTA RICA                      △ SWEDEN

COSTA RICA

I. Fertility trend

Fertility fell rapidly from 1960 to the mid 1970s, but then levelled off (TFR) or even increased a little (CBR) through 1980 (Table 1). The CBR fell about 40 percent between 1960 and 1973, from 48 per 1,000 to 29-30. It remained at 30 through 1976; then it may have risen a bit to 32 by 1980. The trend in the TFR was similar, but the decline between 1960 and 1976 was somewhat more rapid. It fell by almost 50 percent between 1960 and 1976 from 7.3 to 3.7. From 1976 through 1980 it fluctuated between 3.7 and 3.9.

II. Explanation of the trend

A. Changes in the crude birth rate

The more rapid decline in the TFR than in the CBR indicates that there were changes in the age-sex structure which tended to slow down the fall in the CBR. During the early 1960s, the proportion of women aged 15-49 as a percentage of the total population is estimated to have been about 21 percent. By 1975, it is estimated, it rose to 23.5 percent, and by 1981, according to the 1981 census data, it was 25.6 percent. Rosero (unpublished paper, no date) notes that the change in the age structure from 1960 to 1965 contributed 18 percent (-1.1/-6.2) to the decline in the CBR that occurred then (Table 2). But between 1965 and 1978, the CBR would have declined by 16.3 points instead of 10.0, reaching a level of 25.8 instead of 32.1, if there had been no change in age composition.

Table 1 Crude Birth Rate and the Total Fertility Rate, Costa Rica, 1960-80

YEAR	CBR (a)	CBR (b)	TFR (c)
1960	--	48.3	7.29
1961	--	46.7	7.21
1962	45.4	45.1	7.02
1963	45.3	45.0	7.03
1964	43.0	42.9	6.71
1965	42.3	42.1	6.54
1966	40.9	40.6	6.30
1967	39.0	38.6	5.96
1968	36.2	36.2	5.52
1969	34.4	34.4	5.17
1970	33.4	33.3	4.92
1971	31.3	31.7	4.58
1972	31.2	31.5	4.42
1973	28.5	29.9	4.08
1974	29.5	29.6	3.91
1975	29.5	29.6	3.80
1976	29.8	29.8	3.72
1977	31.1	31.1	3.81
1978	29.9	32.1	3.87
1979	30.2	32 (d)	3.9 (d)
1980	29.4	32 (d)	3.7 (d)

Sources: (a) U.N., 1983: Table 21; (b and c) Gallagher, 1980: Tables II and III; (d) Rosero, 1981: Table 2.

Table 2 Effects of Changes in Age Structure of the Population and in Nuptiality on the Trend in the Birth Rate, 1960-1978

Index	Year				
	1960	1965	1970	1975	1978
<u>Births per 1,000 inhabitants</u>					
<u>Birth rates</u>					
Observed	48.3	42.1	33.3	29.6	32.1
Theoretical <u>a/</u> assuming the constancy of:					
Composition by age	48.3	43.1	32.8	26.2	26.8
Nuptiality (rates of first births)	48.3	43.2	34.4	29.6	32.2
<u>Period</u>					
	1960-65	1965-70	1970-75	1975-78	1965-78
<u>Changes in birth rates</u>					
Observed	-6.2	-8.8	-3.7	+2.5	<u>-10.0</u>
Attributable to changes in:					
Composition by age	-1.1	+1.5	+2.9	+1.9	<u>+ 6.3</u>
Nuptiality	-1.1	0.0	+1.1	-0.1	<u>+ 1.0</u>

a/ Structures maintained are those reported in 1960.

Source: Rosero, n.d.: Table 2.

Since the changes in age structure contributed to the fertility decline only modestly during the early 1960s and worked against the decline thereafter, it follows that the age-specific birth rates must have fallen by a large amount--large enough to offset the inflating effect of the increased proportion of women of reproductive age and still produce a large drop in the crude birth rate.

During the first half of the 1960s, the age-specific birth rates (ASBR) fell much more rapidly among women under age 35 than among women 35 or more (Table 3). During the late 1960s, however, older women reduced their fertility at a rate about equal to that of younger women. Moreover, whereas the TFR dropped by 10 percent between 1960 and 1965, it fell by 25 percent during the late 1960s. During the first half of the 1970s, the pace of decline continued to increase among older women, but slowed among younger ones. Indeed, among teenagers, the ASBRs rose a bit. Finally, the late 1970s saw the ASBRs going up (even if only slightly) among women under age 35 (except for those 20-24), while they continued to fall among women 35 and over. The TFR fell almost as rapidly (23 percent) in the period 1970-75 as in the preceding five-year period (25 percent). As noted above, however, there was virtually no change during the late 1970s.

Over the two decades, the TFR fell by 49 percent, with the decline in the ASBRs varying inversely with age around this average decline. The drop among teenagers (12 percent), however, was much smaller than among women over age 19. As a result of this pattern of change, births occurred increasingly at an early age. Whereas, for instance, one-third of births in 1960 was to women under age 25, by 1980 42 percent took place among women of this age.

**Table 3 Age Specific Fertility Rates**  
**Costa Rica: 1960-1980**

Age	Births per 1,000 women				
	1960	1965	1970	1975	1980
15-19	122	111	102	104	108
20-24	357	305	239	207	203
25-29	354	318	231	178	184
30-34	297	256	188	130	133
35-39	223	215	144	92	82
40-44	89	88	69	40	31
45-49	16	16	12	8	5
TFR	7.29	6.54	4.92	3.80	3.73

Age	Percentage change				
	1960-65	1965-70	1970-75	1975-80	1960-80
15-19	-9	-8	2	4	-11
20-24	-15	-22	-13	-2	-43
25-29	-10	-28	-23	3	-48
30-34	-14	-27	-31	2	-55
35-39	-4	-33	-36	-11	-63
40-44	-1	-22	-42	-22	-65
45-49	0	-25	-33	-38	-69
TFR	-10	-25	-23	-1	-49

Source: Rosero, et al., n.d.: Table 1.3.

B. Changes in the age-specific birth rates

These changes are determined by changes in the average age at marriage or union and in marital fertility. Annual rates of nuptiality fell considerably during most of the 1960s, but then the trend reversed itself beginning late in the decade. Teenagers apparently postponed marriage during the 1960s, but married at an older age during the 1970s. As a result, changes in nuptiality contributed 18 percent (-1.1/-6.2) to the decline in the CBR from 1960 to 1965 (Table 2). Between 1965 and 1978, however, if there had been no change in nuptiality, the CBR would have fallen by 11 points instead of 10. Obviously, nuptiality changes have had little effect on the decline in the CBR and (by implication) on the TFR in the later period.

Similarly, the data from the 1976 National Fertility Survey (NFS) indicate little change in the median age at first union (World Fertility Survey, 1980). It was 20.8 for the period 1955-65 and 21.0 for 1966-76. The 1976 survey data on median age at first union by current age of the respondents are:

<u>Current age</u>	<u>Year when age 20-24</u>	<u>Median age at first union</u>
25-29	1971	21.7
30-34	1966	21.2
35-39	1961	21.0
40-44	1956	21.1
45-49	1951	21.7

These data are consistent with the increase in fertility during the 1950s followed by the decline during the 1960s.

The factor that was overwhelmingly responsible for the decline in fertility was the drop in marital fertility, resulting from a rapid increase

in the use of contraception, particularly the newly introduced, more efficient methods. Let us look first at the fall in marital fertility.

Stycos (1978) notes that of the 30 percent drop in the general fertility rate between 1965 and 1972, the period during which fertility declined most rapidly, 87 percent resulted from the fall in the fertility of legally married women, and 44 percent of this was to women in their late 1920s. He concludes that "the fertility decline in Costa Rica was initiated, and to a considerable extent realized, by young married women" (Stycos, 1978:20).

During the late 1970s, however, marital fertility levelled off. Rosero (1981:36) presents data on the total fertility rate of ever-married women from the 1976 NFS (referring to 1974-75) and the 1981 CPS (referring to 1979-80):

	TFR	
	<u>NFS 1976</u> <u>(1974-75)</u>	<u>CPS 1981</u> <u>(1979-80)</u>
All women	3.5	3.6
Ever-married women	3.9	3.8

The differences of 0.1 between the 1976 and the 1981 data could be accounted for by sampling or other error; hence, they should not be regarded as a real change.

According to vital statistics data, the level of the TFR for all women was essentially the same at both dates, 3.8 in 1975 and 3.7 in 1980. Though the survey TFRs are lower, they confirm the levelling off during the late 1970s indicated by the vital statistics data. That marital fertility, as well as the fertility of all women, was level indicates that the levelling off of the TFR was not influenced by changes in nuptiality.

C. Changes in marital fertility

These changes may be explained by changes in family size preferences; knowledge of contraceptive methods; acceptability of family planning; breastfeeding; and use of contraception, abortion, or sterilization.

Multivariate analysis of CPS 81 data regarding the use of contraception found it related weakly to socioeconomic status (residence, class, education) or accessibility of contraceptives (because sources of supply are almost always nearby). The factors that were most strongly related were reproductive preferences and intentions, the acceptability of family planning, and the knowledge of contraceptive methods (Rosero 1981:87). We look first at preferences.

1. Family size preferences

Prior to the 1976 NFS, data on preferences were collected in a 1964 survey of women aged 20-50 living in the urban portion of the Metropolitan Area of San Jose (Costa Rica's capital and largest city) and in a 1969 survey of women aged 15-49 living in rural and semi-urban places (i.e., cities and towns with less than 20,000 inhabitants) of the country (Rosero, et al., no date:17). Comparing each of these two sets of data with the comparable data from the 1976 survey, the striking finding is that little change seems to have occurred. The mean number of children desired by urban women in unions was 4.1 in 1964 and 3.9 in 1976. Similarly, the analogous figures from the "rural" surveys were 4.9 in 1964 and 4.7 in 1976 (Rosero, et al., n.d.:47).

If the 1976 and the earlier data were perfectly comparable, they would indicate a slight decline. If error and noncomparability tended to inflate the 1976 data relative to those collected in the 1960s, they would be underestimating the decline. But for all we know, there may have been an opposite bias, tending to exaggerate the apparent decline. In the latter

case, if the bias were more than moderate, there would have been an increase rather than a decrease in the number of children preferred, which seems unlikely. It follows that, unless there was a large bias tending to reduce the apparent decline, the available data show several notable things: (1) the desired family size seems to have been between four and five during the late 1960s; (2) it was apparently higher in rural than in urban areas, but by perhaps no more than 20-25 percent; and (3) little, if any, decline between the late 1960s and 1976 seems to have taken place.

Given the high level of the TFR (and, by inference, the total marital fertility rate) during the 1960s--a level higher than that of the reported desired family size--Costa Rican women, especially in the rural areas, must have had a lot of incentive to control their fertility. As we shall see, as effective contraception was made increasingly available, these women put it to use, accelerating the decline in fertility. By 1976, the TFR of all women was well below four (3.5) and that of ever-married women was close to four (3.9) (Rosero 1981:36). Thus, the number of children that women in unions were having by then had converged to about the number they said they wanted. Desired family size scarcely changed between 1976 and 1981 (Rosero, 1981: Table 24). It would seem, therefore, that Costa Rican women in unions had little further incentive by the late 1970s to reduce their fertility any more than they had done already. This situation helps explain the levelling off of marital fertility during the late 1970s. Whether it accounts for all of the stall is more difficult to ascertain.

## 2. Acceptability and knowledge of family planning

Turning from reproductive preferences to the acceptability and knowledge of family planning, national data are available again only for the late 1970s or early 1980s. Looking first at acceptability, 81 percent of

women of reproductive age in unions in 1981, in response to a direct question about acceptability, were in favor of married couples using methods to avoid pregnancies, while only 7 percent were opposed. Eleven percent said that it depended on the particular circumstances of each family (Rosero 1981:56). Indirect evidence indicates that acceptability was not much lower during the late 1960s (Rosero et al., n.d.:74).

As for knowledge, 96 percent of urban women in unions in 1964 knew of some method, and 86 percent of rural women in unions in 1969 had such knowledge. By 1976, such knowledge had become universal. However, the average number of methods known increased considerably between the 1960s and 1976, from 3.5 to 6.4 among urban women and from 2.8 to 5.6 among rural women. In addition, from the Contraceptive Prevalence Surveys of 1978 and 1981, it was learned that 93 percent knew where to obtain at least one method in 1978, with a further increase to 98 percent in 1981.

Knowledge of specific methods increased considerably between the 1960s and 1976, especially in the rural areas (Rosero et al., n.d.: Table 6.9). With respect to sterilization, for instance, the increase in the urban sector was from 73 percent in 1964 to 97 percent in 1976. In the rural sector, the increase over a briefer period (1969 to 1976) was substantially greater, from 47 to 92 percent. Well over 90 percent of the 1981 respondents said they had heard of each of the pill, IUD, condom, and female sterilization, and over 90 percent knew where to obtain the pill and sterilization, 87 percent the condom, and 81 percent the IUD (Rosero 1981: Table 27). Thus, by the late 1970s there was a very high level of knowledge and acceptability.

### 3. Breastfeeding

The percentage of children born in the three years preceding the 1976 NFS who were breast-fed was 75 percent, the next to lowest figure in a comparative analysis of World Fertility Survey (WFS) data from 19 countries. In eight of the ten Asian countries in the study, over 90 percent of these children were nursed. Similarly, the average duration in months of breastfeeding for children born within the three years preceding the WFS ranged from a high of 26 months for Bangladesh to a low of five months for Costa Rica and Guyana (Kent 1981:14 and 17).

On the basis of the average duration of the interval since the birth of the last child, Rosero (1981:40-41) calculated a modest increase in the duration of breastfeeding from 5.6 months observed in the 1976 NFS to 7.2 months in the 1981 CPS. He adds that this increase probably took place because of the "strong" campaign conducted by public health agencies during these years to promote breastfeeding, thereby reversing the apparent decline inferred from the shorter duration of breastfeeding among women under age 40 (5.8-5.9 months) than among women age 40-49 (7.9 months) found in the 1976 survey (Rosero et al., n.d.:65). Rosero also calculated that a one-month increase in the duration of lactation increases post-partum infecundity by one-third of a month (Rosero 1981:40). Hence, the observed increase of 1.6 months in the average duration of breastfeeding means there was an increase of about one-half of a month in post-partum infecundity. In sum, lactation does not seem to have been a significant factor affecting fertility during the late 1970s or earlier.

### 4. Contraception, sterilization, and abortion

In addition to contraception, sterilization has been a significant means of birth control in Costa Rica. Abortion, however, appears to have been a negligible factor.

Beginning with contraception, it is pertinent to note, as context for the analysis of changes in contraceptive prevalence, that the fertility of rural women during the 1960s exceeded that of urban women, on average, by approximately 3-4 children. By the late 1970s, however, the differential was reduced to about one child (Rosero 1981:39, and Rosero et al., n.d.:26). In conjunction with the data on desired family size presented above, which showed that rural women wanted only about one child more than urban women (perhaps as many as two if allowance is made for the later date of the rural than the urban survey and if it is assumed that desired size was declining during the 1960s), these data suggest a stronger motivation to reduce fertility among rural than among urban women.

Let us begin the analysis by looking at women in the urban part of the San Jose metro area in 1964 (Tables 4 and 5). The level of contraceptive prevalence (49 percent) is strikingly high for that date. Since the National Family Planning Program was not established until 1968, it indicates a substantial development of private and commercial sources of services and supplies. There was a heavy reliance on traditional non-appliance methods (rhythm, withdrawal, douche, etc.), which were used by half of the contraceptors. The condom was virtually the only appliance method, but it was by far the favorite single method, used by one-third of all contraceptors. More than 10 percent of the women had by then resorted to female sterilization.

Prevalence was much greater among women who had completed primary school than among those who had not. Over 70 percent of contraceptive use was for ending reproduction, with the remainder for spacing births. This is consistent with the observation that actual fertility exceeded desired family size. Clearly, the motivation to control fertility was strong in urban San

Table 4 Percentage of women of reproductive age living in unions who were currently using a contraceptive, by residence, purpose of use, and education, Costa Rica, 1964, 1969, and 1976

Education and Purpose of Use	Urban			Rural		
	1964	1976	Increase	1969	1976	Increase
<u>All women</u>						
<u>All users</u>	49	73	24	24	64	40
For ending reproduction	35	41	6	15	39	24
For spacing births	14	32	18	9	25	16
<u>Women who did not complete primary school</u>						
<u>All users</u>	38	69	31	20	61	41
For ending reproduction	30	46	16	13	43	30
For spacing births	8	23	15	7	18	11
<u>Women who did complete primary school</u>						
<u>All users</u>	57	75	18	42	69	27
For ending reproduction	38	39	1	25	30	5
For spacing births	19	36	17	17	39	22

Source: Rosero et al., n.d.: Table 6.3

Table 5 Percent of women of reproductive age living in unions who were currently using a contraceptive, by type of contraceptive, by residence Costa Rica, 1964, 1969, 1976, and 1981

Type of contraceptive	Urban		Rural		National	
	1964	1976	1969	1976	1976	1981
Pill	1.1	20.6	7.7	23.5	22.5	20.6
IUD	n.a.	5.7	2.1	4.9	5.2	5.7
Injection	n.a.	1.0	n.a.	2.7	2.0	2.2
Condom	15.8	13.6	1.6	5.4	8.8	8.4
Vaginal methods	1.9	2.8	0.1	0.7	2.0	1.2
Female sterilization	5.6	15.9	4.8	15.8	15.9	17.3
Vasectomy	n.a.	1.5	0.2	0.6	1.0	0.5
Rhythm	7.3	6.9	3.9	3.9	5.1	6.2
Withdrawal	9.0	4.5	2.7	4.9	4.6	2.8
Other "natural" methods	8.1	0.6	1.1	1.6	0.9	0.3
Total Using	48.8	73.1	24.2	64.0	68.0	65.2

Sources: Urban and rural data: Rosero et al., n.d., Table 6.5  
National data: Rosero 1981, Table 3.5.

Jose in 1964, particularly among the better-educated women. Attractive and effective means of doing so, however, were scarcely available.

The prevalence of contraceptive use was not nearly as great among rural and semi-urban women as among women living in urban San Jose. The 1969 survey of the former group found that only one-quarter of the respondents were currently using a contraceptive, which was half of the level of prevalence in the latter group. (The difference may, indeed, have been greater since the rural survey was conducted five years after the urban survey, during which time prevalence may have increased.) The educational differential was greater among rural (42/20) than among urban women (57/38). There was also relatively less use of contraceptives for ending reproduction in the rural (62 percent of users) than in the urban sector (71 percent of users). In addition, the distribution of methods used was different. The percentage using the new, more effective methods, especially the pill, was considerably greater among rural than among urban women. The later date of the rural survey is very likely the reason for this difference since the importation of the pill and the IUD increased rapidly between 1964 and 1969 (Rosero et al., n.d.:66). On the other hand, much smaller percentages of rural than urban women reported using the natural methods and the condom.

To what extent was the lower contraceptive prevalence in the rural than in the urban sector the result of a weaker motivation to control fertility or of more limited knowledge of and access to contraceptives? The data needed to answer this question definitively do not seem to be available. However, the stress in the literature on the great importance of the establishment of the National Family Planning Program (NFPP) in getting rural women to use contraception implies that prior to the NFPP the availability of contraceptives was very limited for rural women. Since the

NFPP was established in 1968, there could hardly have been much improvement in availability by the time of the 1969 survey.

Furthermore, with rural women saying in 1969 that they wanted on average about five children but were estimated to have around seven then, there would seem to have been a strong motivation to control fertility. This should be expressed by the use of contraception to stop having more children rather than to space births. The data show that most rural contraceptors in 1969 did report using contraceptives for the purpose of ending reproduction. What is puzzling, however, is why the rural percentage reporting use for that purpose is less than the urban percentage, since the difference between actual and desired fertility seems to have been much larger among rural than among urban women. As we just noted, the rural difference was about two children. In the 1964 urban survey, however, the respondents' desired family size averaged a bit over four children, even while the estimated TFR was about 4.5 around 1964. (The appropriate measure here should be the total marital fertility rate rather than the TFR, because the respondents reporting desired family size were women in unions. The requisite upward adjustment of the TFR, however, would increase the difference between actual and reported desired size among both urban and rural women, probably with little alteration of the rural-urban differential in the gap between actual and desired fertility.)

It seems reasonable to conclude, therefore, that at about the time the NFPP was established by the government, rural women were motivated to reduce their fertility (though perhaps not as strongly as urban women), but had only just begun to have effective means for doing so made available to them.

The government did not then (or subsequently) adopt a policy of reducing the birth rate. The aims of the NFPP were to improve maternal and

child health and to offer at little or no cost information, instruction, and the means for the practice of responsible parenthood. To achieve these aims, family planning units were set up in the service centers of the Ministry of Health and the Social Security system, the coverage of which was virtually universal (Rosero 1981:13 and n.d.:25). Given the considerable motivation to reduce fertility, it is not surprising that the annual number of new clients increased rapidly between 1968 and 1972, before slowing down and then peaking in 1975-76 (Rosero 1981: Table 3). The trend in the private sector is not known.

By 1976, contraceptive prevalence reached a very high level, one surpassed by few developing countries. Indeed, it was comparable to that observed in the United States and in Western Europe (Lightbourne et al., 1982:32-33). Of the women exposed to the risk of conception (i.e., in unions, fecund and not pregnant) in 1976, 78 percent were using some method of contraception. The rate was substantially lower only among women 45-49 years old (64 percent) or with no living children (39 percent) (World Fertility Survey, 1980:10). The increase was greater in the rural than in the urban sector and among the lesser-educated women, which were the groups in which prevalence was low during the 1960s. As a result, the differences in prevalence by education and residence were reduced considerably.

As for purpose of use, among the better-educated women, the increase in use was almost completely limited to the spacing of births. Among the less-educated urban women, there were equivalent percentage-point increases for both purposes. The relative increase, however, was much greater for spacing than for limiting births. Only among the less-educated women in the rural sector did the absolute and relative increases for limiting births exceed those for spacing births. Could this have been because the gap between

actual and desired fertility was greater among these women around 1970 than among better educated or urban women?

Prevalence changed greatly in both the urban and rural sectors not only with respect to use of any method but also with respect to the use of specific methods. Pre-eminent were the increases in the use of the pill and female sterilization, as the following summary table, excerpted from Table 5, makes evident:

	Percentage Using		
	Any method	Pill	Female sterilization
Urban			
1964	48.8	1.1	5.6
1976	73.1	20.6	15.9
Increase in percentage points	24.3	19.5	10.3
Ratio (1976/1964) of percentages	1.5	18.7	2.8
Rural			
1969	24.2	7.7	4.8
1976	64.0	23.5	15.8
Increase in percentage points	39.8	15.8	11.0
Ratio (1976/1969) of percentages	2.6	3.1	3.3

In the urban sector, the sum of the increases in the pill and sterilization exceeds the increase in use of any method because of offsetting declines in the use of some other methods. This did not occur among rural women. The absolute and relative gain of the pill was greater in the urban than in the rural sector. (The extremely large relative increase is not significant, since it reflects the difference in the availability of the pill

between 1964 and 1969.) This is consistent with the greater increases in use for spacing births among urban than rural women (Table 4). The absolute and relative increase in the use of sterilization was a bit greater in the rural than in the urban sector, which is consistent with the greater rural than urban increase in use for limiting births (Table 4). That difference is so large, however, that one wonders why the rural-urban difference in the absolute and relative increases in sterilization were not greater than those observed. The explanation probably includes the fact that sterilization is not the only means used for limiting births. It is regrettable that these data on the kind of methods used were not broken down by purpose of use and education, as in the case of the prevalence of use (Table 4). For then it would be clearer how the shifts in the methods used corresponded to the changes in the purposes for which they were used and how this occurred by level of education. It would then be ascertainable, for example, whether the increased use of sterilization for the purpose of limiting births was greater among the less-educated women, as the differential changes in prevalence shown in Table 4 suggest.

Another notable point in Table 5 concerns the use of the traditional methods. The rural women did not use them much, in contrast with the urban women. This is most evident with respect to the condom, though the rural-urban differential narrowed between the 1960s and 1976. The other significant instance is the use of the rhythm method. The greater use of the traditional methods by the urban than the rural women reflects the differences in prevalence and in when the modern methods began to be distributed on a large scale. As noted above, urban prevalence was high as early as 1964, only shortly after the introduction of the pill and before the IUD became available among urban women (probably especially among those who were better

educated). Thus, this high level of prevalence had to be achieved by the use of the traditional appliance (condom) method and the "natural" methods (rhythm, withdrawal, douche). In the rural areas, however, where contraceptive knowledge and availability were quite limited until the NFPP was set up in 1968, when the pill and the IUD were available for mass distribution, the women largely by-passed the traditional methods.

Table 5 also shows very little (if any real) change between 1976 and 1981 regarding both prevalence and type of method used. Data from a 1978 survey, not shown in Table 5, are very similar to the 1976 and the 1981 data, reinforcing the picture of a levelling off of contraceptive use during the late 1970s (Rosero 1981:59).

An important reason for the levelling off of sterilization was the unfavorable publicity it received during the late 1970s. There was much press coverage in 1977 of an inquiry by the national legislature of an alleged campaign of mass sterilization of Costa Rican women. One year after it began, the inquiry concluded there was no such campaign, but in the interim the health officials had imposed restrictions on this operation (Rosero 1981:71). Indeed, the large increase in sterilization which took place between the 1960s and 1976 might have been even greater if it had been legally permitted for contraceptive reasons rather than simply for medical reasons and if the NFPP (and not just the Social Security system clinics) had provided it (Gomez and McCarthy, 1982:3, and Rosero, et al., n.d.:69).

What was the impact of sterilization on fertility? "Had no women been sterilized in Costa Rica in the five years prior to the NFS, the total marital fertility rate would have been 4.54, when in fact it was 4.2. Hence, sterilization averted .34 births per married woman between 1971 and 1976," a reduction of 7.5 percent (Gomez and McCarthy, 1982:11).

As for abortion, there is agreement (Rosero, 1981:34; Stycos, 1978:53-54; Gomez and McCarthy, 1982:8) that induced abortion has been a negligible influence. This is not inferred simply from the fact that it is illegal and subject to severe penalties, nor that few respondents say they have had an induced abortion. Data from four surveys conducted between 1976 and 1981 show that the percentage of pregnancies born alive was steadily 88-89 percent. Involuntary fetal mortality of 11 or 12 percent would be consistent with data reported in studies of fetal mortality (Rosero, 1981:33-34).

D. Changes in the effectiveness of the family planning program

Mauldin and Lapham (1984:40) describe the family planning program in Costa Rica as "strong" in 1972 but "weak" in 1982. (The scale they use comprises four categories: strong, moderate, weak, and very weak or none.) Of a possible maximum score of 120, Costa Rica's program in 1982 is scored only 39.8, placing it in the middle of the range (25-54) of the weak category. Its score on the four main program components are:

	<u>Actual score</u>	<u>Possible score</u>
TOTAL	39.8	120
Policy and stage-setting activities	10.3	32
Service and service-related activities	11.8	52
Recordkeeping and evaluation	4.4	12
Availability and accessibility	13.3	24

Since there are major differences in the 1972 and 1982 measures of program effort, scores for 1972 comparable to those for 1982 are not available. As just noted, however, the 1972 measure did result in a score which placed the program in the "strong" category. This large deterioration in the effectiveness of the program, from a strong one to a weak one, coincides with the levelling off of the fertility decline. The question arises, then, why did the effectiveness of the program decline so much?

To begin with, "...the crucial element which... reduced fertility in Costa Rica [was] the spread of the [decline] to the rural zones and to the groups with lower educational levels. If the persons without a secondary-school education had not joined the process, scarcely a third of the decline in fertility would have taken place." (Rosero, n.d.: 14-15). By the late seventies, however, the fertility trend in both rural and urban areas had levelled off and even begun to increase. Similarly, after a large drop in their fertility (sharply reducing educational differentials), the fertility of the poorly educated, as well as those with more schooling levelled off. The NFPP had done much to enable the women with little education and those in rural areas to have access to fertility-control means and services. The heavy dependence of these women on the NFPP and public institutions which offered sterilization operations is indicated in Table 6.

After the establishment of the NFPP in 1968, the annual number of consultations it provided increased rapidly from 27,000 in 1968 to a peak of 235,000 in 1976. Between that year and 1980 the number levelled off at around 225,000. Similarly, the number of new users served by the NFPP, after rising from almost 10,000 in 1968 to 31,000 in 1976, declined to 20,000 in 1980. In addition, since 1977 public health institutions do not provide a sterilization operation "...without a strong medical reason to justify it" (Rosero, n.d.:32). Summarizing the shortcomings of the program in the late 1970s, Rosero (n.d.:27) notes that it "is not part of an official policy to reduce births, it has not been encouraged by the principal leaders of the country, it does not offer abortion or sterilization, it does not conduct follow-up activities in the home, and the work of training and motivating medical personnel has lost its initial impulse."

Table 6 Use of contraceptives and source of supply according to area of residence and educational Level of the Woman, Costa Rica, 1978 (percent)

Variable	Use contraceptives or are sterilized a/	Contraceptives supplied by the family planning program b/	Sterilized in public institutions c/
Total	76.7	56.3	81.4
Area of Residence			
Metropolitan area	78.8	41.7	72.5
Other urban areas	78.1	54.4	81.2
Rural	74.5	69.0	88.0
Years of Education			
Under 3	70.8	64.0	94.0
3 to 5	75.1	70.1	91.1
6 to 10	77.1	56.4	75.8
11 and more	84.3	31.2	45.7

a. Percentage of women living in conjugal union (legal or consensual), fertile and not pregnant, or sterilized.

b. Women who use contraceptives but who are not sterilized, equal to 100.

c. Total women sterilized (or with sterilized husband) equal to 100.

Source: Rosero, n.d.: Table 7.

There are a number of reasons why the NFPP and the sterilization program reached their peaks around 1976 (Gallagher, 1980:10). By that date, the initial zeal of the personnel who had started the program was flagging. There was growing opposition from the left and the right, and prominent political leaders or groups were no longer providing support. In addition, new medical arguments arose questioning the need for and the efficacy of the program. Unfavorable publicity resulted from the rumors that the NFPP was sponsoring a massive campaign to sterilize Costa Rican women. Though the

rumors were found to be without foundation, the bad publicity created persisting doubts. There were also complaints about the harmful side effects of some contraceptives, and a judgement was obtained against the program on the grounds that the IUD was a form of induced abortion and hence illegal. The case was finally dismissed by the Supreme Court, but again it left a bad impression.

Moreover, policy was modified (though not overtly) by a new, more conservative government, which took office in 1978. The National Population Council was replaced by a new interministerial organization, the National Commission for Population Policies, only one member of which seemed concerned with population issues. The Commission recognized family planning as a right, independent of any demographic objectives that might be sought, but otherwise it did little and was not expected (as of around 1979) to do more.

#### E. Social and economic changes

Real per capita income grew at an average annual rate of 2.8 percent in Costa Rica between 1960 and 1982 (World Bank, 1984: Table 1). At such a rate, doubling time is 25 years. Hence, there was almost a doubling of real per capita income during this 22-year period, raising Costa Rica to the ranks of the middle-income countries.

From at least 1950 on, Costa Rica became increasingly urban and industrial. The pace of urbanization was slow, however, with the percent of the population living in urban places increasing only modestly between 1960 and 1982, from 37 to 43 percent (World Bank, 1984: Table 22). But industrialization was more rapid, with the percent of the male labor force in agriculture declining from 63 percent to 42 percent between 1950 and 1975. The pace of change was much swifter after 1960 than before (Table 7). Similarly, the share of GNP of industrial origin increased much more rapidly during the 1960-75 period than during the decade 1950-60.

Table 7 Selected indicators of social and economic development  
Costa Rica, 1950-1975

	1950	1960	1975	Average annual rate of change (percent)	
				1950-60	1960-75
Percent of male labor force in agriculture	62.6	58.9	41.8	0.6	2.3
Percent of GNP of industrial origin	13.4	13.8	21.2	0.3	2.9
Life expectancy at birth	55.7	61.6	71.1	1.0	1.0
Infant mortality (per 1,000 births)	98	76	38	2.5	4.6
Percent of 5-19 year olds enrolled in primary or secondary school	38.9	51.5	66.0	2.8	1.7
Circulation of newspapers (per 1,000 persons)	84.9	90.0	100.1	0.7	0.6
Telephones (per 1,000 persons)	1,114	1,243	4,858	1.1	9.1

Source: Rosero, no date: Table 4 for indicators.  
Rates of change calculated from indicator data.

Though life expectancy increased at the same steady pace during both of these periods, the decline in the infant mortality rate accelerated after 1960. Primary school enrollment was virtually universal by 1960, but there were very large increases in enrollment in secondary schools and in higher education between 1960 and 1981 (World Bank, 1984: Table 25):

	<u>1960</u>	<u>1981</u>
Percent of 12-17 year olds enrolled in secondary school	21	48
Percent of 20-24 year olds enrolled in higher education	5	26

And, lest there be any doubt that women were sharing in these educational advances, it should be noted that a larger percentage of females than males age 12-17 were enrolled in secondary school in 1981, 51 percent versus 44 percent (World Bank 1984:199). Indicative of the trend is the fact that the percentage of women age 20-34 (the main childbearing ages) completing primary school increased between 1950 and 1973 from 20 to 53 percent, with an acceleration taking place after 1963, when the percent completing primary school was 32 percent (Rosero, n.d.:19).

There was also a considerable expansion of the means of communication between 1950 and 1975. Per capita newspaper circulation rose at a modest, steady pace, but per capita telephone installations accelerated very sharply after 1960 (Table 7). There was little TV prior to 1963, but once introduced, it was adopted rapidly, as the following figures comparing radio and TV indicate (Rosero, n.d.:20):

	<u>1963</u>	<u>1973</u>	<u>1978</u>
Percentage of dwellings with radio	54	77	90
Percentage of dwellings with TV	6	37	70

Rosero (n.d.:17-18) argues that fertility started to decline in 1960 because social and economic development had reached a threshold level for a decline at around that time. Furthermore, he contends that the pace of the fertility decline was influenced by the subsequent rate of social and economic development (Rosero, n.d.:34 and Rosero, 1981:12). As noted above, in a number of respects, the pace of development accelerated between 1960 and 1975, during which period fertility declined rapidly. Given the apparent association between the rate of development and the rate of fertility decline during the period 1960-75, it would be helpful to have a homogeneous time series of development indicators to around 1980. We could then see whether there was a stall in the development trend, as well as in the fertility decline, during the period 1975-80.

Stycos (1982:25) concludes that the key factors were education in initiating the fertility decline and the national family planning program in spreading it to rural and low status women. "... a very high urban or a high literacy threshold was required before fertility was affected" (Stycos 1982:29). Urbanization's influence was mainly via its relationship with literacy, and "literacy's effect on fertility was explained both by lower marital fertility and higher proportions of single women in areas of higher literacy." Furthermore, Stycos speculates that lower marital fertility "was achieved by such means as coitus interruptus or periodic abstinence" (Stycos, 1982:29). The mechanisms whereby the initial decline began to spread to the

less modernized cantons of the country "remain obscure." "A diffusion hypothesis is tempting," but the rapidity of the process makes it seem more like "near-instantaneous osmosis" (Stycos 1982:29-30). During the last stage of the decline, family planning "clinics were established where they were most needed" and "use of the new clinic-distributed methods ... acted to accelerate a decline already initiated by socio-economic forces" (Stycos 1982:28 and 30).

In Stycos' analysis, nothing is said about fertility preferences. Did increasing education and economic development, especially after 1950, lead Costa Rican women to reduce their family size desires? Or had the number of children wanted been moderate for some time already, with the number born exceeding the number wanted for lack of effective means of control? The latter seems to be the more reasonable interpretation of the available data. As was observed above (in the discussion of fertility preferences), the average number of children desired was reported to be between four and five during the 1960s, when the TFR was falling from over seven (early 1960s) to close to five (1969). By 1976, the mean desired family size reported by survey respondents was still between four and five (Rosero 1981:47). A correction for rationalization, however, suggests that desired family size was more likely 3.5-4.0 than 4.0-5.0 (Rosero 1981:47). In any case, by 1976 the TFR had fallen to under four (Table 1). Thus, it appears that by the middle of the 1970s, Costa Rican women were having the number of children they wanted and were no longer motivated to reduce their fertility any further. The levelling off of contraceptive use between 1976 and 1981 is consistent with this argument. In addition, under these conditions, the weaker governmental support of the family planning program during the late 1970s (noted above), may have been more feasible politically than it would have been previously.

F. Summary

Fertility dropped swiftly from 1960 to the mid 1970s, but then levelled off during the late 1970s. The birth rate fell nearly 40 percent from 48 in 1960 to about 30 around 1975, while the total fertility rate fell more rapidly--practically halving--from 7.3 in 1960 to 3.7 in 1976. Between 1976 and 1980 it fluctuated between 3.7 and 3.9. The birth rate increased somewhat during the late 1970s as a result of the continued increase in the proportion of women of reproductive age.

In the early phase of the decline (1960-65), changes in age structure contributed somewhat to the fall. But between 1965 and 1978, the birth rate would have dropped by 16 points instead of 10 if there had been no change in age composition. As for nuptiality, it had an effect like that of the change in age structure during the period 1960-65, but had a negligible effect thereafter.

The main reason for the fall in fertility was the drop in marital fertility. The latter occurred because of a rapid increase in the use of contraception, particularly the newly introduced, more efficient methods. The rapid increase in use occurred because, with marital fertility exceeding the number of children wanted during the 1960s, there was considerable incentive to control fertility. Then the National Family Planning Program, which was established in 1968, expanded rapidly, particularly in rural areas and among the poor, providing contraceptive services and supplies at little or no cost. Consequently, the fertility decline accelerated. By 1974-75, the TFR of ever-married women had dropped to around four, which was about the average level of desired family size.

Perhaps it was no coincidence, then, that the fertility decline stalled thereafter. Marital fertility plateaued between 1974-75 and 1979-80,

probably because of the levelling off of contraceptive use (including contraceptive sterilization) which took place then. The latter may well have occurred as a result of either or both of (1) the convergence of desired and actual fertility by the late seventies, or (2) the weakening of the family planning program after 1976, as political support for it waned.

Abortion has been a negligible factor, and lactational infecundability a minor one.

KOREA

I. Fertility trend

Because birth registration has been incomplete, Korean fertility has been estimated mainly from census data (using the own-children method) and survey data (Cho et al., 1982:1-2). Fertility declined by about 50 percent during the two decades of the 1960s and 1970s (Table 8). But the decline was not continuous; two periods of stalled fertility can be observed, 1967-71 and 1975-80. Between 1960 and 1967 fertility fell sharply, then levelled off until 1972. A further rapid fall occurred until 1975. Then, the decline decelerated greatly through 1980, the last date for which data are available. Of the countries included in this study, Korea is the only one in which two stalls have taken place.

Between 1960 and 1967 the CBR fell 28 percent, from 42.1 to 30.3. Then, between 1967 and 1972, it dropped only three percent. This stall was followed by a swifter decline than the first one, with the CBR dropping 23 percent between 1972 and 1975, from 29.3 to 22.8. Between 1975 and 1980, the CBR again came to a virtual halt, falling only two percent.

A similar pattern of decline-pause-decline-pause can be seen in the trends of the general fertility rate (GFR) and the TFR. The main difference between these two measures and the CBR is that they declined somewhat more than the CBR. Between 1960 and 1980 they fell 54 percent, whereas the CBR fell 47 percent. The reason for this difference is that the proportion of women of childbearing age (15-49 years) in the population increased from 23 to almost 27 percent. Such an increase inflates the CBR but has no effect on the GFR or the TFR. Thus, there was a decline in fertility between 1960 and 1980

Table 8 Indices of fertility Republic of Korea, 1960-82

<u>Year</u>	<u>Crude Birth Rate</u>	<u>General Fertility Rate</u>	<u>Total Fertility Rate</u>
1960	42.1	182	5.98
1961	39.6	172	5.62
1962	38.1	166	5.41
1963	37.6	165	5.35
1964	34.0	150	4.86
1965	32.2	142	4.61
1966	31.9	141	4.59
1967	30.3	134	4.34
1968	31.2	137	4.42
1969	30.8	134	4.39
1970	29.8	129	4.24
1971	29.8	128	4.26
1972	29.3	124	4.18
1973	27.3	114	3.86
1974	25.9	107	3.62
1975	22.8	92	3.14
1976	23.1	90	3.1
1977	22.6	87	3.0
1978	21.8	83	2.8
1979	23.1	87	2.9
1980	22.4	84	2.7
1982			2.7

Note:

- Fertility estimates for the five-year period 1976-80 are based on unpublished own-children data from the 1980 Census.
- The crude birth rate is the number of births per 1,000 persons in the population.
- The general fertility rate is the number of births per 1,000 women aged 15-49 years.
- The total fertility rate is the sum of the age-specific birth rates per 1,000 women. Here it is expressed as the average number of births per woman.

Source: All but 1982: Cho et al., 1982: Table 6;  
1982: Korea Institute for Population and Health, 1982: Table 3.

of 54 percent. Seven points of this decline was offset, however, by an increase in the relative number of women of childbearing age. Interestingly, between 1960 and 1967, this relative number appears to have fallen a little to about 22.6 percent. Thereafter, however, it increased steadily, reaching 26.7 percent in 1980. As a result, the declines in the GFR and the TFR were greater than the drop in the CBR only after 1967. Whereas the CBR fell only two percent between 1975 and 1980, the TFR dropped by 12 percent. The TFR of 1980 (2.7) and 1982 (2.7) suggest that fertility may have begun to level off during the early 1980s.

## II. Explanation of the trend

### A. Changes in the crude birth rate

In addition to the changes in the proportion of women of childbearing age noted above, the trend in the CBR was influenced by the changes in the age-specific birth rate (ASBR) of women of childbearing age. With few exceptions, these rates fell steadily between 1960 and 1980 (Table 9). Two of three exceptions, however, are notable and significant. Among women 25-29 years of age, at which age the ASBRs have been highest, there were increases (even if only slight) between 1966 and 1970 (roughly the period of the first stall) and 1975 and 1980 (the time of the second stall). The second exception is that there was no change between 1966 and 1970 in the ASBRs of women 30-34 years old. The ASBRs of these women, though lower than those of women aged 25-29 years, were nevertheless very high until the late 1970s. (The third exception, the slight increase between 1960 and 1966 in the ASBRs of women 45-49 years of age, because of the very low level of the ASBRs, is of negligible import.)

Table 9 Age-specific birth rates (all women) Republic of Korea, 1960-80

Age	Year				
	1960	1966	1970	1975	1980
15-19	35	19	13	12	5
20-24	249	193	174	153	130
25-29	323	290	298	256	264
30-34	273	207	207	131	111
35-39	204	131	111	55	31
40-44	96	61	43	18	7
45-49	16	17	8	3	1
Total Fertility Rate (per 1000 women)	5980	4590	4270	3140	2745
Percentage of TFR accounted for by the birth rate of women 25-29 years old *	27	32	35	41	48

\* TFR = sum of the ASBRs multiplied by five (i.e., the size of the age interval). Hence, to get this percentage, the ASBR of the women age 25-29 must be multiplied by five before being related to the TFR.

Source: Cho et al., 1982: Table 7.

B. Changes in the age-specific birth rates

These changes are determined by changes in the percentage of women married at various ages and in the rates at which married women give birth. The TFR, which summarizes the ASBRs, changed little between the 1930s and 1960s because the increase in marital fertility which occurred during that period was offset by a large decrease in the proportion married, especially among those under 25 years of age. In 1935, the average age at first marriage for women was about 17 years. By 1960 it had increased to 21.5 years. After 1960, women's average age at marriage continued to rise, even if at a slower rate than during the preceding years, and by 1975 it was close to 24 years. At such a high level, little further increase was expected.

These changes imply that the percentage currently married decreased greatly among women under 25. Table 10 shows just how large these declines were. Whereas most girls 15-19 years old were married during the 1930s, by the mid-1960s virtually none were. Though not as massive, the decline among women aged 20-24 was also dramatic. During the 1930s, in accordance with the traditional custom, virtually all women were married by that age. But by 1975, little more than a third were. An estimate for 1980 indicates little change in this percentage. Among older women the prevalence of marriage fell at all ages between 1935 and 1955, though by much smaller amounts than among the younger women. After 1955, however, except for women 25-29 years old, the declining trend was reversed, as the reduction in mortality lowered the prevalence of widowhood. In a society such as Korea's, in which there is little out-of-wedlock fertility, such a great increase in the average age at first marriage means a correspondingly great increase in the average age at which childbearing begins.

Table 10 Percentage of women currently married, by age,  
Republic of Korea, 1935-1975

Age	1935	1955	1960	1966	1970	1975	1980*
15-19	61.6	14.3	7.0	3.8	2.8	2.6	n.a.
20-24	94.7	75.1	65.0	47.7	42.3	37.2	37.1
25-29	96.6	89.7	93.3	89.8	88.4	86.8	86.8
30-34	95.1	89.8	91.9	93.9	94.6	94.4	94.1
35-39	91.9	87.0	88.4	89.2	92.0	93.2	93.9
40-44	86.3	81.4	82.4	82.7	84.8	88.2	87.5
45-49	78.6	73.6	76.3	75.2	76.8	79.1	n.a.
15-49	85.6	67.8	67.4	64.2	62.9	59.5	n.a.

\* Estimated by the ratio of the age-specific birth rates of married women to those of all women (shown in Tables 9 and 11).

Source: Cho et al., 1982: Table 15.

These data on marriage explain much of the decline in fertility, but they shed little light on the reasons for the stalls during the late 1960s and the late 1970s. We need, therefore, to look at the changes in marital fertility.

As the data in Table 11 make plain, there were large drops in marital fertility between 1960 and 1980 among wives older than age 29. Among wives 15-24 years old, the rates fluctuated without any definite change. The fluctuating pattern was also evident for wives 25-29 year of age, but there seems to have been a modest decline between 1960 and 1980. Again, these data seem to help us understand the general decline in fertility but not the reasons for the stalls. If, however, we look at the pace of change in each of the four periods of the 1960s and 1970s (the first and second halves of each decade) and compare these changes in marital fertility with those of all women, a pattern emerges which does throw light on the stalls.

Table 11 Age-specific birth rates (currently married women)  
Republic of Korea, 1960-1980

Age	Year				
	1960	1966	1970	1975	1980
15-19	460	500	460	460	a/
20-24	378	405	411	411	350
25-29	347	323	337	295	304
30-34	298	220	219	139	118
35-39	232	147	121	59	33
40-44	117	74	51	20	8
45-49	22	23	10	4	1

a. Too few women to provide a reliable rate.

Source: Cho et al., 1982: Table 7.

The comparison, shown in Table 12, is limited to women 20-44 years old because the low birth rates of women 15-19 and 45-49 mean that changes at these ages could hardly have had any effect. Two patterns are worth noting. The first tells us the reasons for the fertility decline. In this pattern, we see that the percentage changes during the four periods were very similar in the two groups of women, except among those 20-24 years of age. Though the marital fertility of the latter did not change much until the late 1970s, the fertility of all women of this age fell substantially and continuously from 1960 on. This tells us that it was the large declines in the prevalence of marriage at this age which was responsible for the drop in fertility from 1960 to 1975. Between 1975 and 1980 there was virtually no further decline in the percent married, so the 15 percent drop then among all women is accounted for by the 15 percent decline in marital fertility. As was noted above, when examining the changes in the prevalence of marriage, there was much less change in prevalence among women over age 24. It is not surprising, therefore, that the changes in the fertility of all women aged 25-44 during the four periods examined here closely parallel the changes in the fertility of wives of this age. So, the sharp reductions in the prevalence of marriage among women under age 25 reduced their fertility between 1960 and 1975. During the subsequent period, however, the reason for the fall in the fertility of these young women was a drop in their marital fertility. The same reason accounts for the decline in fertility of women over age 24.

The second notable pattern helps to explain the stalls. During the period 1966-70, roughly coincident to the time of the first stall, the proportionate fertility declines in all age groups from 20 to 44 either slowed down or were reversed. During the late 1970s, when the second stall occurred, there was a similar tendency, but it was less pronounced at ages 25-39 and did

Table 12 Percentage changes in age-specific birth rates  
(all women and wives) Republic of Korea, 1960-80

Period	Age				
	20-24	25-29	30-34	35-39	40-44
<u>All Women</u>					
1960-66	-22	-10	-24	-36	-36
1966-70	-10	3	0	-15	-30
1970-75	-12	-14	-37	-50	-58
1975-80	-15	3	-15	-44	-61
<u>Currently Married Women</u>					
1960-66	7	-7	-26	-37	-37
1966-70	1	4	0	-18	-31
1970-75	0	-12	-37	-51	-61
1975-80	-15	3	-15	-46	-60

Source: Calculated from the data in Tables 9 and 11.

not occur at all among those 20-24 and 40-44 years of age. By then, however, the birth rates of women 35-44 years old had fallen to very low levels and was greatly reduced among those aged 20-24. Indeed, as may be seen in Table 11, fertility became increasingly concentrated among women 25-29. Whereas their ASBR accounted for 27 percent of the TFR in 1960, by 1980 it accounted for 48 percent. It is all the more significant, therefore, that at this age the fertility decline was reversed during both the late 1960s and the late 1970s, even if the increases then were only slight. Among women aged 30-34, whose fertility had also been high, there was no change between 1966 and 1970, a pronounced break from the trend of sharp decline during the preceding and the following period. During the late 1970s their fertility continued to fall, but at less than half the rate of decline of the preceding period.

The data in Table 13 measure and summarize the relative effect of the changes in marital status and marital fertility on the decline of the TFR in each of the three periods between 1960 and 1975. During this interval the TFR fell by almost three children per woman, and three-quarters of that fall resulted from the decline in marital fertility. Almost all of the fall in marital fertility occurred to wives 30-49 years old. Indeed, among younger wives, there was a substantial increase in marital fertility during the period 1966-70, accounting for most of the deceleration in the fall of the TFR which took place then. The other factor contributing to this deceleration was the increase in the percent married of women 30-49.

Unfortunately, the period of the second stall was not included in this analysis. But the available data indicate that the drop in the TFR of about 0.4 of a child per woman (Table 8) resulted overwhelmingly from the continued decline in marital fertility among women 30-49 (Table 12). (As Table 10 shows there was little change in the prevalence of marriage during

Table 13 Percent decomposition of the change in the total fertility rate, by age, Republic of Korea, 1960-1975

<u>Period and Age</u>	<u>Marital status</u>	<u>Marital fertility</u>	<u>Total</u>
<u>1960-66</u>			
15-29	36.1	1.6	37.8
30-49	-3.1	65.4	62.2
Total	33.0	67.0	100.0 (-1.39)
<u>1966-70</u>			
15-29	49.2	-22.6	26.6
30-49	-10.7	84.1	73.4
Total	38.5	61.5	100.0 (-0.32) (-0.35) <sup>a</sup>
<u>1970-75</u>			
15-29	11.9	16.4	28.3
30-49	-0.9	72.6	71.7
Total	11.0	89.0	100.0 (-1.13) (-1.10) <sup>a</sup>
<u>1960-75</u>			
15-29	27.6	5.2	32.7
30-49	-3.2	70.5	67.3
Total	24.4	75.6	100.0 (-2.84)

Note: Because of rounding errors, rows and columns do not always add precisely to marginal totals. Numbers in parentheses in the lower right of each panel indicate change per woman in the TFR over the period indicated.

a. Calculated from the data in Table 8.

Source: Cho et al., 1982: Table 10.

this interval.) The decline in marital fertility was moderated by a deceleration in the decline among wives aged 30-34 and an increase (even if slight) among wives 25-29 (Table 12). During this period, the ASBRs of women 25-34 accounted for about 65 percent of the TFR.

#### C. Changes in the percent married

As noted above, there was a very large drop in the percent married between 1935 and 1955. Data on the average age at marriage indicate that the change occurred mainly after 1940. The period from 1940 to 1955 was characterized by political and social upheaval and severe economic deterioration, with World War II, the end of Japanese rule, the partitioning of Korea, and the Korean War. The poor economic conditions made early marriage difficult, and the Korean War also caused a delay in marriage.

By 1960, the average age at first marriage had reached a fairly high level. Nevertheless, it continued to rise about as rapidly as before, reaching one of the highest levels in the world by 1970. (At that date, it was over 23 for women and over 27 for men.) The factors responsible were rapid urbanization, swift educational expansion, and compulsory military service of three years for males (Cho et al., 1982:85-86).

These changes help account for the general decline in fertility but not the two stalls in the decline.

#### D. Changes in marital fertility

The determinants of changes in marital fertility are changes in (1) preferences regarding the number and sex of children and when they should be born, (2) breastfeeding practices, and (3) the use of birth control.

##### 1. Fertility preferences

Number of children. Data on the ideal number of children obtained in numerous surveys indicate that changes in family-size norms generally parallel the decline in fertility (see Table 14). The data also show that the decline

in these norms appears to have levelled off during the late 1960s and late 1970s, when the stalls occurred. Related to the general decline in the number of children wanted are changes in the value of children, which seem to have resulted from the rapid urbanization and industrialization Korea experienced during the 1960s and 1970s. The utility of children as workers on the family farm or business or as contributors to the family income has been declining. Similarly, the expectation that children will support their parents in old age, though strong, has been declining. Furthermore, children have become more expensive to raise as the society has urbanized and education has expanded (Cho et al., 1982:8-9).

Table 14 Average number of children considered ideal, Republic of Korea, before 1960 to 1982

Year	Ideal Number of Children
Before 1960	Approx. 5
1958	4.4
1965	3.9
1966	4.3
1967	3.9
1968	3.9
1971	3.7
1971	3.6
1973	3.1
1974	3.2
1974	3.0
1976	2.6
1976	2.7
1976	2.8
1978	2.7
1982	2.5

Note: Each figure comes from a different survey. In some years several surveys were taken. In 1971 there were two surveys, and in 1976 there were three.

Source: All but 1982: Cho et al., 1982, Table 21.  
1982: Korea Institute for Population and Health, 1982:2.

Sex of children. There has long been a strong preference for sons in Korea. Though the number of children wanted and born has been cut in half, son preference has not weakened as much and is still clearly evident. The eldest son traditionally has had the responsibility for carrying on the family name, ancestor worship, and support of the elderly parents. Thus, no more than one son is needed today, when mortality is low, to perform these duties. As a result, Korean couples want one son, but once they have one son most couples do not want another, unless he is their only living child (Table 15).

Table 15 Percent of currently married, fecund, nonpregnant women who want no more children, by number of living sons and daughters, Republic of Korea, 1974

Number of Living Daughters	Number of living sons						All
	0	1	2	3	4	5+	
0	13	16	77	94	(100)	(96)	51
1	12	71	97	99	100	(100)	74
2	36	82	98	99	(100)	*	86
3	47	81	99	100	(100)	*	87
4	(55)	81	99	(100)	*	*	86
5+	*	93	(100)	*	*	*	88
All	23	64	94	98	100	99	74

Note: Fecund women are believed to be physically capable of bearing children.

( ): Less than 50 cases.

\* : Less than 20 cases.

Source: Cho et al., 1982: Table 26.

There is a disagreement about the impact of son preference on fertility, in particular whether it will make the further reduction of Korean fertility difficult. The author of one study, for example, says that his findings "seem to indicate that ... son preference strongly affects Korean fertility" (Park, 1983: 348). And the Korea (sic) Institute for Population and Health (1982:2) contends that "son preference in Korea exerts a substantial influence on family planning practice.... For example, 71 percent of couples with two sons are practicing contraception, while only 41 of those with two daughters are doing so." In another study, however, the author concludes that "it is likely that son preference will have some dampening effect on the fertility decline in Korea, but that it will not be a major obstacle to the achievement of Korea's fertility goals" (Arnold, 1983: 22). In the latter study it is assumed that if sex preferences were to disappear "couples at each parity would act in the same manner as those at the same parity who are currently most satisfied with the sex composition of their children" (Arnold, 1983: 7). Using data from the Korean National Fertility Survey of 1974, and this assumption, it is found that the percentage of currently married, fecund women wanting no more children would rise by only five percentage points, from 75 to 80 percent. The rate of contraceptive use would rise more (from 46 to 55 percent), but the increase would still be only a minor fraction of the actual rate. The author also notes, however, that the use of data on past as well as present sex preferences would result in a stronger effect of sex preference on fertility in Korea than found in his study (Arnold, 1983: 19). How much stronger is not indicated.

Timing preferences. It was noted above that the average age at first marriage rose greatly, while fertility among women over age 29 fell tremendously. Consequently, childbearing came to be concentrated increasingly

at age 25-29. Analysis of data from a 1976 survey indicated that the ideal span between marriage and the last birth was only 5-7 years for the majority of the respondents (Rindfuss et al., 1982:100). First, second, and third birth intervals decreased sharply during the late 1960s. At the same time, higher birth intervals tended to level off, in contrast to increases during the early 1960s and early 1970s. These changes help to account for the fertility stall of the late 1960s (Cho et al., 1982:49). (No information is available about fertility timing during the late 1970s.)

A major reason for the reduction in the first birth interval was a rapid increase in the rate of premarital pregnancy, which was associated with a shift from arranged to romantic marriages. The relative number of first births that occurred within nine months of marriage rose between 1955 and 1970 from about 10 to almost 30 percent. Reductions in the birth intervals after the first seem to have resulted in part from declines in the duration of breastfeeding (Rindfuss et al., 1982:91 and 97).

Breastfeeding. Nursing has been nearly universal in Korea for a long time. But during the past few decades, lengthy breastfeeding has become less popular. In 1950, for instance, nearly half of the mothers who nursed their first child did so for at least 24 months. By 1970, less than 20 percent nursed their first child that long. There was a similar decline in the proportion nursing more than 18 months, but no change in the shorter period of more than nine months (Cho et al., 1982:55). These changes in nursing practices tended to reduce the interval between lower-parity births. Furthermore, survey data indicate that women with no sons may have deliberately stopped breastfeeding in order to accelerate the birth of the child, in hope of getting a son (Rindfuss, et al., 1982:102).

Changes in birth control. The government established a national family planning program in 1962. At that time, abortion was the only effective method, but was infrequently used (Cho et al., 1982: 6). Birth control was adopted rapidly, however, and by 1976 it was "practically universal" (Foreit, 1982: 234). The gains were more rapid among rural women and those with relatively little education, narrowing educational and residential differentials considerably (Cho et al., 1982: 132-34).

Abortion. Table 16 shows that the total induced abortion rate (TIAR) increased more than four times during the period 1960-76, with the increase considerably swifter among rural women. (Seventy-two percent of Korea was rural in 1960. By 1980, only 43 percent was rural.) This measure may be interpreted to mean that, whereas in 1960 about one of every two ever-married women (550 per 1000) would have had an abortion by the end of her reproductive years, by 1976 every 10 ever-married women would have had 23 abortions (2310 per 1000) by the time they concluded their childbearing. This interpretation assumes that the women would have experienced throughout their reproductive life cycle the age-specific induced abortion rates that occurred at each date. This would happen if the rates scarcely changed over the years. This, of course, did not happen. (The rapid rise in abortion rates implies that these TIARs underestimate the average number of abortions ever-married women actually had or would have.) Given this rapid increase in the use of induced abortion, the proportion of ever-married women having one (as well as the average number of abortions they had) rose substantially, from 13 percent in 1966 to 50 percent in 1982 (Table 17). There are indications that abortion has been under reported, but it is not clear whether or not reporting became more complete over time, especially after 1973, when the abortion law was liberalized (Westoff, 1980: 61).

Table 16 . Total induced abortion rates per 1000 ever-married women by type of area, Republic of Korea, 1960-76

Year	Whole Country	Seoul	Other Urban	Rural
1960	550	1184	1001	249
1961	610	1658	848	264
1962	748	1562	906	468
1963	935	2146	1223	522
1964	992	1878	1342	632
1965	1326	2964	1623	753
1966	1347	2764	1653	830
1967	1413	2452	2086	855
1968	1430	2430	2087	899
1969	1755	2424	2794	1142
1970	1652	2004	2446	1200
1971	1590	2114	2100	1170
1976	2310	2720	2430	1890

Note: The total induced abortion rate is the analog of the total fertility rate (Table 8). Thus, it is the sum of the age-specific abortion rates.

Source: Cho et al., 1982: Table 31.

Table 17 Percentage of ever-married women who had an induced abortion Republic of Korea, 1966-82

Year	Percentage
1966	13
1971	26
1973	30
1974	31
1976	39
1978	48
1982	50

Sources: 1966: Cho et al. 1982, Table 30; 1971-78: Westoff 1980: Table 3; 1982: Korea Institute for Population and Health 1982:1.

Contraception. There was also a steady and considerable gain in the use of other methods of birth control, as Table 18 makes evident. In 1961, it appears that only about 10 percent of wives of reproductive age used contraceptives (including contraceptive sterilization). By 1979, more than half such women were doing so, with the figure continuing to rise at least through 1982.

Table 18 Percentage of currently-married women age 15-44 using contraception, by type of contraception, Republic of Korea, 1961-1982

Year	Method					
	All	IUD	Pill	Condom	Sterili- zation a/	Other
1961	9 <sub>b/</sub>					
1966	20	9	1	6	2	2
1971	25	7	7	3	4	4
1976	44	11	8	6	8	11
1979	54	10	7	5	20	12
1982	58 <sub>c/</sub>	7	5	7	28	10

a. Includes male as well as female sterilization. In 1979, 14.5 percent used female sterilization. This rose to 23.0 percent in 1982.

b. Percent of women of reproductive age.

c. Sum of methods does not equal total because of rounding.

Sources: 1961: Donaldson et al. 1982:227; 1966-79: Cho et al. 1982, Tables 27 and 29; 1982: Korea Institute for Population and Health 1982, Table 1.

The IUD was the favorite method until the late 1970s, when the popularity of sterilization leaped dramatically. There was, in addition, a notable gain during the 1970s in the use of "other" methods. This category includes douche, rhythm, spermicides, and withdrawal (Cho et al. 1982: 135), all of which are less effective than the other methods specified in Table 18. Thus, of the increase of 34 percentage points between 1966 and 1979, 24 points (71 percent) were accounted for by the more efficient methods and 10 points (29 percent) by the less efficient methods. Among the efficient methods, sterilization accounted for a large majority of the gain. Between 1979 and 1982, female sterilization continued to gain rapidly, while the other methods declined or showed little increase (condom).

The use of sterilization increased sharply and abruptly between 1975 and 1977. Why? During the 1960s the annual sterilization rate (either vasectomy or tubal ligation) per 1000 ever-married women (themselves or their husbands) aged 20-39 was very low. After 1969, however, it began to rise. From well under 5 per 1000 in 1969, it reached close to 10 by 1973. Then it accelerated to over 20 in 1975, 30 in 1976, and over 60 in 1977 (Westoff et al. 1980: Figure 1). While the vasectomy rate essentially levelled off between 1975 and 1977, the tubal ligation rate jumped from 11 to 53 per 1000. This happened because the procedure became simpler and safer than it had been with the introduction of laparoscopy in 1976. In addition, government payments to physicians were tripled, lowering the patients' costs considerably (Westoff et al. 1980: 136-137).

Relationships among abortion, contraception, and sterilization.

Women who used contraception have been much more likely to have had an induced abortion than women who did not use contraceptives (Table 19). Since use of contraceptives indicates a desire to avoid pregnancy, it is not surprising

that users are more likely than non-users to terminate a pregnancy. The Korean National Fertility Survey of 1974 found that, of those who had never used contraception, only 11 percent had had an induced abortion. Among those who had used contraception, however, the percentage who had had an induced abortion was about four times as great (Donaldson et al. 1982: 229). It is clear, therefore, that abortion has been a supplement rather than an alternative to contraception for many Korean women.

Table 19 Number of induced abortions per 1000 live births to women aged 15-39, by contraceptive use, Republic of Korea, 1960-74

<u>Period</u>	<u>Total</u>	<u>Used Contraceptives</u>	<u>Did not use Contraceptives</u>
1960-64	77	891	50
1965-69	175	831	108
1970-74	277	843	160

Source: Donaldson et al. 1982: Tables 1 and 2.

Though the relationship is not nearly as strong, there was also a positive association between sterilization and abortion; in 1978 couples in which the wife had had an abortion were more likely to be sterilized than those in which the wife had not had an abortion (Westoff et al. 1980: Figure 9). More importantly, it appears that sterilization has been "making a major contribution to reducing abortions. Depending upon assumptions about the amount of underreporting of abortions in the 1978 survey, we estimate that sterilization may be averting as much as one abortion per woman" (Westoff, et al. 1980: 145). On the other hand, because of the frequency of use of

abortion to prevent unwanted births, sterilization has had a relatively small impact on fertility. The number of births averted by sterilization is estimated to have been 0.13 (2.9 percent of the total marital fertility rate) in 1973-74, 0.18 (4.2 percent of the TMFR) in 1975-76 and 0.30 (9.2 percent of the TMFR) in 1977-78 (Westoff et al., 1980: 145). It is apparent, however, that though sterilization's impact was small during these years, it was growing.

The timing of changes in birth control and fertility. The large general decline in fertility during the 1960s and 1970s clearly coincides with the large general increase in the use of abortion, contraception, and sterilization. It is more difficult, however, to detect whether or not there are parallels in the trends of adoption of abortion, contraception and sterilization and the decline-stall-decline-stall pattern of fertility decline. On the one hand, the total induced abortion rate (TIAR) increased rapidly between 1960 and 1969, then declined somewhat through at least 1971, only to rise substantially again some time between 1971 and 1976 (see Table 16). These fluctuations approximate those of the total fertility rate. On the other hand, Table 17 indicates that the percentage of ever-married women who had an induced abortion rose just as much (in percentage points) between 1966 and 1971 as between 1971 and 1976. Nor did there seem to be any slackening of the increase after 1976. But since the latter measure is a cumulative one, while the former is not, changes in the TIAR may provide a better measure of the short-run variations in the use of abortion.

Similarly equivocal are the data on contraception in Table 18. The increases in the use of any method of contraception parallel the fluctuating trend of fertility decline, but the changes in the use of specific methods are

not as consistent. Regarding all methods, the absolute and relative percentage-point increases were:

	<u>Absolute</u>	<u>Relative (%)</u>
1961-66	11	122
1966-71	5	25
1971-76	19	76
1976-79	10	23
1979-82	4	7

The percentage-point changes in specific methods were as follows:

	<u>IUD, Pill, Condom a/</u>	<u>Sterilization a/</u>	<u>Other methods b/</u>
1966-71	1	2	2
1971-76	8	4	7
1976-79	-3	12	1
1979-82	-3	8	-2

- 
- a. More effective methods
  - b. Less effective methods

There was a much larger increase in all methods during the early 1960s and 1970s than the late 1960s, which is consistent with the fertility trend. The very large increase in sterilization after 1976, however, is not consistent with the slowdown in the rate of fertility decline which occurred then, even allowing for the decline in the use of the other effective methods (i.e., the IUD, pill and condom), unless the latter are used much more than the former by women in the main childbearing ages, 25-34.

In sum, though not as definite as one would like, the available data on changes in the use of birth control seem to be roughly congruent with the decline-pause-decline-pause pattern of fertility change. Why there were such fluctuations in the use of birth control is not evident.

#### E. Social and economic change and the national family planning program

Major social and economic change occurred in Korea between 1960 and 1980 (Table 20). Real per capita income increased more than threefold. The

society changed from being highly rural and agrarian to predominantly urban and industrial. The means of communication expanded greatly, as did the education of the population. The rapid increase in the education of women of reproductive age is particularly important, given the pronounced inverse relationship between women's education and fertility that has been found in Korea and elsewhere (Cho et al., 1982: 61-62). Under these conditions, the value of children changed, their costs increased, and couples began to want fewer of them. At the same time, with an average annual rate of population growth of 2.7 percent during the period 1960-66, the government came to see the need for lowering it in order to help raise per capita income and set a target of reducing it to 2.0 percent by 1970. The Planned Parenthood Federation of Korea was established in 1961 with a high government official as its president. In the following year, a national family planning program was started and a Korean Institute for Family Planning was established. Over the years, a number of government agencies have made important contributions to the success of the family planning program (Cho et al. 1982:126-129).

Mauldin and Lapham (1984:40-41) characterize this program as strong in 1972 and 1982. At the latter date its total score of 96.9 (out of a possible maximum total score of 120) is second only to that of China, with a score of 100.9. Its scores on the four main components are:

	<u>Actual score</u>	<u>Possible score</u>
TOTAL		96.9120
Policy and stage- setting activities	22.8	32
Service and service- related activities	40.8	52
Record keeping and evaluation	9.3	12
Availability and accessibility	24.0	24

Table 20 Selected indices of socioeconomic development, Republic of Korea, 1960-1980

Index	1960	1966	1970	1975	1980
Percent urban	28	34	41	48	57
Percent of women aged 15-49 who have more than a primary education	12	21	30	42	..
Per capita income (US \$)					
Current prices	82 <u>b/</u>	125	243	574	1597 <u>a/</u>
1975 prices	241 <u>b/</u>	307	408	574	810 <u>a/</u>
Percent of employed population working in secondary secondary and tertiary industry	37 <u>c/</u>	42	50	54	66
Electric power (KWH) per person	69 <u>b/</u>	132	284	562	946 <u>a/</u>
Radios per 1000 households	121 <u>b/</u>	214 <u>d/</u>	525	857 <u>e/</u>	..
TV sets per 1000 households	5 <u>b/</u>	9	65	259	850
Telephones per 1000 households	28 <u>b/</u>	61	93	173	242

a. Value is for 1979 instead of 1980

b. Value is for 1961 instead of 1960

c. Value is for 1963 instead of 1960

d. Value is for 1965 instead of 1966

e. Value is for 1974 instead of 1975

Source: Cho et al., 1982: Table 1.

Since there are major differences in the 1972 and 1982 measures of program effort, scores for 1972 comparable to these for 1982 are not available. As just noted, however, the 1972 measure did result in a "strong" score.

These measures are congruent with the general increase in induced abortion and the use of contraception and the decline of fertility during the 1970s. They do not, however, shed any light on the reason for the marked deceleration in the fertility decline during the late 1970s. As for the 1960s, there is no evaluation of the system of birth control servicing (i.e., information, supplies and services) in either the public or private sectors. The description of the rapid expansion of the public sector (i.e., the national family planning program) and the data showing the large increases in induced abortion and the use of contraception during the 1960s strongly suggest that there was an increase in the effectiveness of the national program during the 1960s. Similar to the information about the 1970s, however, this inference sheds no light on the reasons for the stall in the fertility decline during the late 1960s.

#### F. Summary

During the two decades of fertility decline in Korea, there were two periods in which the decline stalled. Nearly all of the 48 percent drop in the crude birth rate, from 42 in 1960 to 22 in 1980, took place during the early 1960s (1960-66) and early 1970s (1972-75). Similarly, though the total fertility rate fell 55 percent during the two decades, from 6.0 to 2.7, it virtually levelled off from 1967 to 1971 and decelerated markedly after 1975.

Between 1966 and 1970 an increase in marriage among those 30-49 years old, as well as an increase in marital fertility of those under 30, offset declines in marriage among women 15 to 29 years old and in the marital

fertility of women age 30-49. The rise in the marital fertility of the younger women is accounted for by a sharp decrease in the first three birth intervals. The first interval was shortened by an increase in the proportion of premaritally conceived first births, which was associated with a shift from arranged to romantic marriages. Reductions in the length of the second and third birth intervals were influenced by declines in the duration of breastfeeding and an apparently growing desire to terminate childbearing early.

The decline in the total fertility rate decelerated considerably during the late 1970s because of a deceleration in the decline of the birth rate among wives aged 30-34 and an increase among wives aged 25-29. During this period, the birth rates of women aged 25-34 accounted for about 65 percent of the total fertility rate. The reason for these fluctuations is not known.

Despite the decline in breastfeeding, fertility fell because of a large increase in the use of abortion and contraception, particularly the contraceptive sterilization of women after 1975. Though the rapid rise in tubal ligations had an increasingly depressing effect on fertility, sterilization during this period prevented more abortions than births.

Major social and economic changes during the 1960s and 1970s--rising income, industrialization, urbanization, increasing education, and the diffusion of modern means of communications--led couples to want fewer children and to adopt birth control methods to minimize the number of unwanted children. These changes help account for the overall decline in fertility, but not the fluctuations in the pace of its decline or the roughly parallel fluctuations in the rate of adoption of birth control.

The evidence is clear that Koreans prefer sons. But it is not clear whether such a preference has weakened appreciably in recent decades or has had any effect on the decline in fertility, let alone on the fluctuations in the decline.

SRI LANKA

I. Fertility Trend

When fertility began its sustained decline in Sri Lanka and how much it fell are uncertain. It appears, however, that it fell for about 20-25 years, beginning perhaps around 1950. Then it seems to have levelled off during the late 1970s.

The following quinquennial crude birth rates have been reported (Sri Lanka, 1983a:8):

1941-45	36.6
1946-50	38.9
1951-55	38.1
1956-60	36.5
1961-65	34.3
1966-70	31.1
1971-75	28.7
1976-80	28.1

Wright (1968:746) reports birth rates of 39.4 in 1953 and 34.6 in 1963, both of which are years in which a census was taken. The U.S. Bureau of the Census (1977:5), however, reports birth rates of 44 for 1953 and 35 for 1963. The 1953 figure was calculated, the report notes, using registered births adjusted for 12 percent underregistration (official estimate) and an adjusted mid-year population. There was a net underenumeration of the 1953 population of 0.7 percent (ibid:3). The 1963 rate was calculated after adjusting registered births for 2 percent underregistration. This figure was estimated by the U.S. Bureau of the Census "by assuming a continuous rate of improvement between the official estimates of underregistration in 1953 (12 percent) and in 1967 (1 percent)." The denominator of the 1963 rate was obtained by, i.a., adjusting the 1963 enumerated population for a net undercount of 1 percent.

The quinquennial birth rates shown above indicate a decline of 10 percent between 1951-55 and 1961-65. Wright's data for 1953 and 1963 represent a drop of 12 percent. The data presented by the U.S. Bureau of the Census imply a 20 percent fall between 1953 and 1963.

Using the data reported in Table 21, the crude birth rate fell 25 percent between 1960 and 1974, from 36.6 to 27.5. Between 1974 and 1980 it levelled off around 28.

Wright (1968:746) also reports a decline of 11 percent in the general fertility rate from 189 in 1953 to 169 in 1963, noting however that the exclusion in 1963 of 1,370 births to women of unknown age "tends to depress the figures for 1963 and slightly exaggerate the fertility change over the decade." The least change is reported for the total fertility rate by both Newlon (1983:140) and Wright (1968:746), a drop of only 5 percent, from 5.32 to 5.04. The rates are apparently unadjusted. There is a report, however, of a TFR of 5.5 in 1960, after which the TFR fell fairly steadily until the mid-1970s; thereafter it appears to have fluctuated between 3.4 and 3.7 (Table 21).

## II. Explanations of the trend

### A. Changes in the crude birth rate

The TFR, according to these data, dropped 39 percent between 1960 and 1974, from 5.50 to 3.36, considerably more than the 25 percent drop in the crude birth rate. This implies that there were changes in the age structure of the population which counteracted the decline in the age-specific birth rates. There appears to have been no change in the proportion (.204) of women aged 15-44 years (i.e., the childbearing years) in the total population

Table 21 Crude Birth Rates and Total Fertility Rates, Sri Lanka, 1960-1981

Year	Crude Birth Rate	Total Fertility Rate
1960	36.6	5.50
1961	35.9	5.28
1962	35.5	5.28
1963	34.1	5.04
1964	33.2	5.05
1965	33.1	4.95
1966	32.3	4.78
1967	31.6	4.62
1968	32.0	4.61
1969	30.4	4.41
1970	29.4	4.23
1971	30.4	3.98
1972	30.0	3.68
1973	28.0	3.58
1974	27.5	3.36
1975	27.8	3.53
1976	27.8	na
1977	27.9	na
1978	28.5	3.43
1979	28.9	na
1980	27.6	na
1981	28.0	3.71

Sources: CBR: Sri Lanka, 1983b:51; United Nations, 1979:148 (for 1960 and 1961).  
 TFR: Alam and Cleland, 1981: Table 13, except 1963, 1970, and 1974 (Sri Lanka, 1978:98), 1978 (Namboodiri, et al., 1983:136), and 1981 (Sri Lanka, 1983a:42).

between 1953 and 1963. Hence, the decline during that period in the crude birth rate is accounted for by the decline in the rate at which women of this age gave birth, from about 190 births per thousand women to about 169 (Sri Lanka 1974: Table 2.3). Thereafter, however, the relative number in the population of women aged 15-44 increased steadily and substantially until 1981 (latest year for which information was obtained). According to Fernando (1980: Table 2), this proportion rose from 20.4 in 1963 to 21.6 in 1971 and then to 22.8 in 1975 (WFS data). Using the female birth cohort data in the 1971 Census, Fernando projected that the proportion would reach 25.0 by 1981. He ignored mortality, however; hence, the actual figure should be smaller, perhaps around 24 percent. Namboodiri, et al. (1983: Table 2.5) present data showing that 47.9 percent of all females were aged 15-44 in 1981. Among males, the comparable percentage was 47.1 percent. If the number of males and females in the population were similar in 1981, then the percentage of women aged 15-44 in the total population would be a bit more than half of the 47.9 percent indicated above, or about 24 percent. In any case, whatever the precise numbers may be, it seems clear that the relative number of women of reproductive age rose steadily beginning in the early 1960s.

It follows that if there had been no decline in the ASBR, the crude birth rate would have increased. But, as indicated by the large drop of 39 percent in the TFR between 1960 and 1974, the ASBR declined quite substantially. As Table 22 reveals, there were large declines up to 1974 at the ages with the highest ASBR, 20-39. These ASBRs accounted for 90 percent of the TFR during this period. Of the decline in the TFR, they accounted for 86 percent between 1963 and 1970 and for 99 percent between 1970 and 1974. The table also shows the considerable reversal that took place after 1974, particularly among women 20-29 years of age in the period 1978-80.

**Table 22** Age-Specific Fertility Rates, Sri Lanka, 1963-1981

Age Group	Age-Specific Fertility Rates				
	1963 <sup>a</sup>	1970 <sup>a</sup>	1974 <sup>b</sup>	1978 <sup>c</sup>	1981 <sup>d</sup>
15-19	52	38	31	38	34
20-24	228	172	146	129	172
25-29	278	238	161	186	222
30-34	240	219	158	164	177
35-39	157	134	126	105	99
40-44	46	38	43	55	37
45-49	7	6	6	9	0
TFR <sup>e</sup>	5040	4225	3355	3430	3705

Age Group	Percentage Change				
	1963-70	1970-74	1974-78	1978-81	1974-81
15-19	-27	-18	23	-11	10
20-24	-25	-15	-12	33	18
25-29	-14	-32	16	19	38
30-34	-9	-28	4	8	12
35-39	-15	-6	-17	-6	-21
40-44	-17	-13	28	-33	-14
45-49	-14	0	50	-100	-100

a - Registration data

b - World Fertility Survey of 1975

c - Sri Lanka World Bank Survey of 1979

d - Contraceptive Prevalence Survey of 1982

e - The total fertility rate is the sum of the age-specific fertility rates multiplied by five, the number of single years of age in each age group.

Sources: 1963, 1970, and 1974: Sri Lanka 1978:98.  
 1978: Namboodiri *et al.* 1983:136.  
 1981: Sri Lanka 1983a:42.

B. Changes in the age-specific birth rates

In a country like Sri Lanka, where there is little out of wedlock fertility, changes in the ASBR are determined essentially by the proportions married, the age at marriage, and marital fertility. Table 23 shows a steady decline of considerable magnitude in the percentage of women currently married from 1953 to 1975 among women under age 30. Among women 30-44 years old, there were more modest declines between 1963 and 1975, especially during the early 1970s. Similarly, the percentage of young women who had not yet married increased considerably (Fernando 1980, Table 3). The figures for those age 15-19 and 20-24 were:

	<u>15-19</u>	<u>20-24</u>
1953	75.7	32.5
1963	85.0	41.3
1971	89.4	53.2
1975	93.2	60.6

Such a strong trend in the postponement of marriage means that the average age at marriage rose substantially. The female singulate mean age at marriage (calculated from census or survey data on the percentages never married in the various ages from 15 to 50) increased from 20.8 to 24.8 between 1953 and 1975 (Namboodiri et al. 1983:36).

These large changes in the propensity to marry account for much of the decline in the TFR (which is a summary measure of the ASBR). As shown in Table 24, Alam and Cleland (1981:27) estimate that the changes in nuptiality during the period 1963-71 accounted for 59 percent of the 21 percent drop in marital fertility rates. During the early 1970s, the changes in nuptiality accounted for a somewhat smaller (but still large) part (46 percent) of the 11 percent decline in the TFR.

**Table 23 Percentage of Women who are Currently Married, by Age, Sri Lanka, 1953-1981**

Age Group	1953 <sup>a</sup>	1963 <sup>a</sup>	1971 <sup>a</sup>	1975 <sup>b</sup>	1981 <sup>a</sup>
15-19	23.7	14.8	10.4	6.5	10.1
20-24	65.7	57.6	45.9	38.0	43.8
25-29	84.4	81.0	73.4	65.0	68.2
30-34	87.8	88.6	85.9	82.1	81.1
35-39	86.5	89.8	89.3	85.5	85.7
40-44	80.7	86.1	87.8	81.5	85.8
45-49	73.8	81.6	84.9	81.8	83.8

Percentage Change

Age Group	1953-63	1963-71	1971-75	1975-81	1971-81
15-19	-37.6	-29.7	-37.5	55.4	- 2.9
20-24	-12.3	-20.3	-17.2	15.3	- 4.6
25-29	- 4.0	- 9.4	-11.4	4.9	- 5.6
30-34	0.9	- 3.0	- 4.4	- 1.2	- 5.6
35-39	3.8	- 0.6	- 4.3	0.2	- 4.0
40-44	6.7	2.0	- 7.2	5.3	- 2.3
45-49	10.6	4.0	- 3.7	2.4	- 1.3

a - Census data

b - World Fertility Survey

Sources: 1953 and 1963 - Fernando, 1980:53.

1975 - Sri Lanka, 1978:581.

1971 and 1981 - Sri Lanka, 1982: Table B.

Alam and Cleland (1981:42) conclude that "Sri Lanka has followed the typical Asian pattern of fertility decline. Initially changes in total fertility were caused largely or exclusively by rising age at marriage; this was followed by a period in which the effects of nuptiality and marital fertility were about equal, and finally the contribution of marital fertility became more important."

Table 24 Decomposition of the total fertility rate, Sri Lanka, 1963-75

Period	Percent change in TFR	Percent Change in TFR due to:	
		Nuptiality	Marital fertility
1963-71	-21	59	41
1971-75	-11	46	54

Source: Alam and Cleland, 1981:27.

During the late 1970s, however, the decline in the percent married was reversed, with (according to the data in Table 23) notable increases among women under age 25. Registration data on first marriages may provide more specific information on the timing of the change. During the period 1979-81, there were about 120,000 first marriages per year, which was almost 30 percent greater than the annual average of 93,000 in the two-year period 1974-75. Half of this increase occurred, however, by 1976-77 (Sri Lanka 1983a:43). As will be described more fully later, economic conditions improved greatly during the 1978-81 period. To judge from these data on first marriages, it

would appear that they can account for no more than half of the increase in nuptiality which took place during the late 1970s. There are two weaknesses in these marriage data. They are tabulated by date of registration rather than date of occurrence, and they are judged to be less than 90 percent complete (United Nations 1984, Table 25). Hence, the need for caution in using them. They are more defective, however, for estimating the volume than the trend of marriage. Over a short period, in particular, there is not likely to be much variation in the extent of delayed registration and of under-registration. The changes in the number of registered marriages over as short an interval as those being examined in this case are likely, therefore, to provide a reliable indication of the direction of change. Hence, the reversal of the decline in the percent married can be taken to be confirmed by these data on the registration of first marriages. One may, however, be less confident in using them to measure the pace or timing of change. Consequently, how much of the change occurred prior to 1978 is more uncertain.

One can see that the decline in nuptiality was only a bit greater during the early 1970s than between 1963 and 1970. The decline in marital fertility, however, was considerably greater during the early 1970s than during the preceding period (Table 25). This is the reason for the shift in the relative importance of the changes in nuptiality and in marital fertility rates in accounting for the declines in the TFR during these two periods (Table 24).

The marital fertility data for the late 1970s are more difficult to interpret, especially the disaggregation of the 1974-81 period into two parts, up to 1978 and subsequently. The changes in marital fertility are not in the same direction at all ages. Even more puzzling is the shift in the direction of the changes in three of the seven age categories (15-19, 40-44, and 45-49)

from 1974-78 to 1978-80. At least part of the reason for this may errors or elements of noncomparability involved in the surveys from which the data for 1974, 1978, and 1981 were obtained. The 1974 data were gathered in the 1975 survey, which was one of the many national World Fertility Surveys. The 1978 data were gathered in 1979 in a survey sponsored by the World Bank. And the 1981 data were obtained in the Contraceptive Prevalence Survey conducted in 1982. There has been no careful analysis of the comparability of these surveys (at least for the purpose of measuring the changes in nuptiality and fertility) and of the relative quality of the data they provide. Thus, it is not possible to estimate how much of the odd pattern of apparent changes reflects problems of measurement and how much reflects real change.

Keeping in mind the need for caution, let us look nevertheless at the data shown in Table 25. As noted above, the marked economic improvement in the period 1978-81 could account for some of the increase in the percent married, especially among women under age 30, shown in Table 22. It could also have led to an increase in marital fertility, especially among young women. The data in Table 25, however, show a decline in marital fertility among wives aged 15-19 during the period 1978-81 as well as 1974-78. On the other hand, the fertility of wives 20-34 years old did increase, though not by much among those aged 30-34. Furthermore, while the increase during 1978-81 reversed a decline during 1974-78 among wives aged 20-24, the increase during the later period among wives age 25-34 was a continuation of an increase which had apparently already taken place during the preceding interval. Similar puzzles are evident in the changes that took place among wives aged 35-49. It is difficult, therefore, to come to even a tentative conclusion about marital fertility during the late 1970s.

Table 25 Age-specific marital fertility rates, Sri Lanka, 1963-1981

Age Group	1963 <u>a/</u>	1970 <u>a/</u>	1974 <u>b/</u>	1978 <u>c/</u>	1981 <u>d/</u>
<u>Age-specific Fertility Rate</u>					
15-19	354	449	339	310	253
20-24	396	408	357	316	357
25-29	344	323	240	272	302
30-34	270	253	189	201	208
35-39	175	151	139	124	109
40-44	53	42	53	66	39
45-49	8	7	7	12	0
<u>Total Marital Fertility Rate</u>					
15-49	8000	8165	6620	6505	6340
20-49	6230	5920	4925	4950	5075
<u>Percentage Change</u>					
Age Group	1963-70	1970-74	1974-78	1978-81	1974-81
15-19	27	-24	-9	-18	-25
20-24	3	-13	-11	13	0
25-29	-6	-26	13	11	26
30-34	-6	-25	6	3	10
35-39	-14	-8	-11	-12	-22
40-44	-21	26	25	-41	-26
45-49	-13	0	71	-100	-100

a - Registration data

b - World Fertility Survey of 1975

c - Sri Lanka World Bank Survey of 1979

d - Contraceptive Prevalence Survey of 1982

Sources: 1963, 1970, and 1974: Sri Lanka 1978:98.

1978: Namboodiri et al. 1983:136.

1981: Sri Lanka 1983a:42.

### C. Changes in marital fertility

Marital fertility is determined by the number and sex of children couples want and their ability to control fertility to achieve those preferences through the use of abortion, contraception and sterilization. In addition, breastfeeding practices are a significant factor.

#### 1. Family size preferences

We could find no data prior to those obtained in the World Fertility Survey (WFS) conducted in 1975. The Contraceptive Prevalence Survey (CPS) of 1982 also gathered preference data. Unfortunately, preferences were not measured in a comparable way in these two surveys; hence, one cannot judge whether any significant change occurred between 1975 and 1982.

In 1975, one of the preference questions the respondents were asked was: "If you could choose exactly the total number of children to have in your whole life, what would the number be?" (Sri Lanka 1983a:49). The tabulations of the responses to that question are shown in Table 26. In 1982 (CPS), however, the respondents were asked: "If a couple starts their family now, how many children do you feel is best for them to have?" (Sri Lanka 1983a:49). In addition, the respondents were asked how many live births they had and whether they "want to have children in the future?" (Sri Lanka 1983a:110-112). In presenting the results shown in Table 26, the CPS analysts added together the number of living children and the number of additional children stated in response to these questions. Table 26 also shows the response to the question about the "best" number of children.

Each of the three measures of preference is influenced by the number of living children. (The positive association with mother's age probably reflects the association with the number of living children.) However, the association with the "best" number is much weaker than the association with

Table 26 Mean number of children wanted, and considered best, by currently-married women, by age and number of living children, Sri Lanka, 1975 (WFS) and 1982 (CPS)

Age	WFS (1975)	CPS (1982)	
		The number wanted	The best number
15-19	2.6	2.4	2.8
20-24	2.8	2.5	2.6
25-29	3.2	2.9	2.8
30-34	3.8	3.4	2.9
35-39	4.4	4.0	3.0
40-44	4.5	4.7	2.9
45-49	4.8	5.4	3.2
No. of Living Children			
0	2.5	2.0	2.6
1	2.4	2.1	2.5
2	2.7	2.5	2.7
3	3.3	3.1	2.9
4	3.9	4.1	3.0
5 or more	5.5	6.3	3.3

Source: Sri Lanka 1983a:49.

the other two measures. Except for wives 45-49 and those with 5 or more children, the mean number in each category does not vary by more than 0.2 from the mean of 2.8 for all wives. Furthermore, other data indicate a similarly small variation among different sub-groups in the population (Sri Lanka 1983a:50-52). "Thus, there appears [to be] evidence of a widely-held norm about the number of children a family should have" (Sri Lanka 1983a:52).

As for the other two measures, if they were comparable, one might conclude that they reveal some decline in the number wanted between 1975 and 1982, except among women over age 40 or with 4 or more children. As noted above, however, they are not comparable. Not only did the context and the language differ, the CPS measure of preference shown in Table 26 could be no smaller than the number of children already alive, whereas there was no such floor for the WPS question.

Finally, there seems to be no pronounced sex preference, as judged by the results obtained in the WFS. (No data on sex preferences were gathered in the CPS.) Pullum (1981:29), after analyzing the WFS data, concluded that "in Sri Lanka as a whole, and in nearly all socio-economic subgroups, the only significant sex preference is for balance interpreted very broadly as at least one child of each sex."

## 2. Breastfeeding

The only information found on breastfeeding in Sri Lanka came from the WFS (1975). Virtually all (96 percent) of the children born in the three years preceding the survey were nursed. And the mean duration of the breastfeeding of these children was a long 21 months (Kent 1981, Table 1 and Figure 4). Of all ever-married women aged 12-49 with two or more live births, or one birth and a current pregnancy, the mean length of nursing was 17

months, with the length varying positively with the age of these women, as follows (Sri Lanka 1978:139):

<u>Age</u>	<u>Mean number of months</u>
Less than 25	14.2
25-34	16.0
35-44	17.6
45-49	19.4

Mothers 45-49 years old were twice as likely to report nursing for at least two years as mothers less than 25 years of age (40 percent versus 21 percent).

"This pattern probably reflects a historical decline in the popularity of prolonged breastfeeding, though no trend towards exclusive reliance on bottle-feeding is discernible" (Sri Lanka 1978:141). A decline would, of course, tend to increase the probability of conception, and, other things equal, the number of children born. If a decline in the duration of breastfeeding occurred during the 1960s and 1970s, it would have had an effect on marital fertility contrary to the increase in the use of birth control. Without reliable trend data on the duration of breastfeeding, however, the impact of such a decline cannot be measured for either the period of fertility decline (up to about 1974) or the subsequent period in which fertility stalled.

During the stall, a continued decline in breastfeeding would have tended to offset any fertility-depressing factors. If the decline were substantial, the impact would have been considerable. Interestingly, on the basis of theoretical calculations, it was concluded that if the mean length of lactational amenorrhea in Sri Lanka declined from 14 months to six months, in

order to prevent an increase in the total marital fertility rate the level of contraceptive use would have had to increase from 35 percent to 54 percent (McCann et al. 1981, Table 2). As we will see later, there was such an increase in Sri Lanka between 1975 and 1982 (CPS). Hence, if a decline in the mean length of nursing between 1975 and 1982 from 14 to 6 months actually occurred, then it would have been offset by the increase in contraceptive use which did in fact occur. The available data on trends in marital fertility (Table 25) indicate that there was little change in the total marital fertility rate of wives 20-49 years old between 1974 and 1981. Given the observed increase in contraceptive use, this stall in marital fertility seems to imply a decline in the mean duration of breastfeeding of approximately the magnitude indicated above, i.e., from 14 months to about 6 months between 1975 and 1982. Such a decline, however, would represent a sharp acceleration of the decline inferred from the age data shown above.

### 3. Family planning

Family planning activities started in Sri Lanka prior to 1953, when the Family Planning Association (FPA) was established. The government supported the FPA financially and through a bilateral agreement with the government of Sweden for a pilot project, which showed that birth control was feasible. In 1965, family planning became a part of the Department of Health Services. In 1968, a Family Planning Bureau (subsequently named the Family Health Bureau) was set up within the Ministry of Health (subsequently the Ministry of Family Health). An agreement was entered into with the United Nations Fund for Population Activities in 1973 for assistance to family planning activities. The new government of 1977 committed itself to a vigorous family planning program in order, i.e., to reduce the high rate of population growth. As a result of a 1980 seminar on Population and

Development, family planning was supported in a nonpartisan way by the country's major political parties. In addition, monetary and other incentives were increased for acceptors of sterilization, which had declined severely from its preeminent position among the modern methods of contraception in 1974 and 1975, and for the medical teams performing them. Also, the income tax laws were to be amended to eliminate deductions for children (Sri Lanka, 1983a:6-7 and Namboodiri et. al.: 12-14 and 310-311). The result was a substantial strengthening of the family planning program. Mauldin and Lapham (1984: Table 2) rated the strength of the program as moderate in 1972 but strong in 1982.

#### 4. Knowledge of contraception

The WFS found a very high level of knowledge in 1975. Ninety one percent of the respondents had heard of at least one method. In 1982 the CPS found that 99 percent knew at least one method. Thus, by the mid 1970s almost all women had some knowledge of contraceptive methods. However, the percentage of respondents who knew specific methods varied considerably by method, especially in 1975. About 80 percent knew of the pill and female sterilization, 62 percent the IUD, and 51 percent the condom, with smaller percentages for the other methods. By 1982, all the percentages had increased considerably, with knowledge of female sterilization virtually universal (98 percent) and of the pill nearly so (90 percent). Knowledge of rhythm and withdrawal, particularly the latter, were the most limited (60 percent for rhythm and 34 percent for withdrawal in 1982). Perhaps it is more accurate to say that these were the percentages willing to say they knew these methods. Virtually none of the respondents, for example, acknowledged withdrawal spontaneously in either the WFS or the CPS. It was only after prompting (i.e., being asked if they had heard of or knew of withdrawal) that almost all

positive responses occurred. In general, the unprompted percentages exceeded the prompted percentage only for the more effective methods (pill, IUD, and female sterilization), except for male sterilization (Sri Lanka 1983a: 53-54).

Knowledge was already fairly widespread throughout Sri Lanka in 1975. But the increase in knowledge between 1975 and 1982 reduced the subgroup variability considerably. For example, whereas practically all of those with at least a secondary level of education knew of at least one method in both 1975 and 1982, among those with no schooling, the percentage increased from 82 to 98 percent. Thus, the positive association between knowledge of at least one method and education observed in 1975 disappeared by 1982. With respect to knowledge of specific methods, however, there was still a definite positive association with education in 1982 for all methods except female sterilization, which was known to virtually all respondents, whatever their level of education (Sri Lanka, 1983a:61).

##### 5. The acceptance and availability of contraception

The use of contraception was apparently accepted by a very large majority of couples in Sri Lanka in 1975. A further increase in its acceptability seems to have occurred by 1982, at which time opposition to its use appears to have virtually disappeared. In the WFS, those who said they never had used contraception were asked why not. Less than 7 percent (6.8) said they disapproved of family planning. Among the 1,245 respondents who said they wanted no more children but who had never used contraception, 10.3 percent said they disapproved of family planning and another 10.8 percent said their husbands opposed the use of any method (Immerwahr, 1981:23). In the CPS, of currently married women who are not pregnant but not using a method, less than 2 percent (1.6) expressed disapproval of family planning. The

percentage was virtually nil among respondents under age 25, and the largest percentage at any age was 4.7 percent, among women aged 40-44 (Sri Lanka, 1983a:81).

Turning to the availability of family planning services and supplies, the long-run trend saw a large increase. But whether and how the pace of increase varied during the period of fertility decline is difficult to ascertain. And whether there was a levelling off or a reversal of the trend during the late 1970s, when fertility stalled, is also hard to detect. The only detailed data we found are from the CPS (1982). Because of the neglect of this matter in previous surveys and its importance to the delivery of family planning services and supplies, it received considerable attention in the CPS. Information was collected on the respondent's knowledge of a source of specific methods, distance, mode of travel and travel time to sources, and the convenience of obtaining services.

Since the lack of trend data precludes any chance of assessing whether a change in availability played a part in causing the fertility stall, only a summary of the main findings of the CPS are presented (Sri Lanka, 1983a:95-96 and Chapter 7). Almost all non-users of contraceptives knew of a source of at least one modern method. For specific methods, awareness of a source was greater for the better-educated, urban, and non-working women. The less well-known the specific method, the less well-known was its source. The largest source of supply by far was the government. Four of every five women currently using a method obtained it from a government source. Female sterilization and the IUD were supplied almost solely by the government. Twenty four percent of male sterilization and half of injectables were supplied by private sources. Non-program sources (commercial outlets and places of work) supplied 85 percent of condoms and about a third of the

pills. In general, private (mostly FPA) and non-program sources each served about 10 percent of current users. Non-government sources were used more often by the urban and better-educated women.

Convenience of obtaining contraceptive supplies and services was method specific. Condoms and the pill were the methods most easily obtainable. Well over half of the users could get them from a source either within walking distance or within thirty minutes of travel time. Interestingly, though by 1982 female sterilization was the most popular single method used, it was also the least convenient to obtain. One third of its users said it was inconvenient to get, and a majority of them said it required more than an hour of travelling to reach a place that provided it. The latter differed greatly, however, for rural and urban women. Only 19 percent of the urban users said that travel time to a source required more than an hour, whereas 59 percent of rural users reported such a lengthy journey (Sri Lanka, 1983a:91).

Does a lengthier trip reduce use of female sterilization? If it does, then the percentage of rural women using female sterilization should be considerably smaller than the percentage of urban women doing so. And the percentage of both urban and rural women who have been contraceptively sterilized should be greater, the shorter the length of reported travel time. Surprisingly, however, as shown in Table 27, there is virtually no difference in the percentage of rural women who have been contraceptively sterilized (18.1 percent) and the percentage of urban women (17.6 percent). Moreover, the prevalence of contraceptive sterilization among both urban and

rural women is larger (not smaller), the longer the travel time. The association is not strong, but it is definite. Why this is the case is unclear.

Table 27 Percentage of Currently Married Women 15-49, Years of Age Who Had Been Contraceptively Sterilized, by Urban-Rural Residence and Reported Length of Travel Time to the Place of Sterilization, Sri Lanka, 1982

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Length of Travel Time	Urban	Rural	Total
Less than 30 minutes	16.2 (599)	12.8 (751)	14.3 (1351)
30-60 minutes	17.5 (223)	16.6 (767)	16.8 (991)
More than 60 minutes	24.8 (125)	21.6 (1479)	21.8 (1602)
All Women	17.6 (947)	18.1 (2997)	18.0 (3944)

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Note: The number of women reporting specified travel times are shown in parentheses. These numbers are the bases for the percentages shown. Thus, for example, 16.2 percent of the 599 urban wives who reported a travel time of less than 30 minutes reported themselves as contraceptively sterilized.

Source: Sri Lanka 1983a; calculated from the data presented in Tables 7.4, 7.8, and 7.9.

It can also be seen, however, that the prevalence of contraceptive sterilization is slightly greater among urban than rural wives within each travel-time category. But 63 percent (599/947) of urban wives reported a travel time of less than 30 minutes, whereas only 25 percent (751/2,997) of rural wives did so. On the other hand, 49 percent of the latter travelled

over an hour, as compared to only 13 percent of the former. Thus, the longer travel times of the rural wives more than compensated for their slightly lower prevalence of contraceptive sterilization.

These data are a puzzle. On their face, they seem to suggest that the use of contraceptive sterilization can be increased somewhat by increasing the length of time it takes to get to clinics providing this service. Before coming to such a paradoxical conclusion, however, it would be advisable to study this relationship more fully than done here. If it is the result, e.g., of selective processes, then these need to be ascertained before sensible policy conclusions can be drawn.

#### 6. The use of contraception

As noted above, family planning was made a part of the activities of the Department of Health Services in 1965. Then the Family Planning Bureau (later called the Family Health Bureau) was created in 1968. The emphasis at first was on the use of IUDs (Table 28). During the late 1960s, the emphasis shifted to the pill, and by 1969 the number of new pill acceptors reported by the Bureau exceeded the total of the new acceptors of the IUD and sterilization. The IUD seems to have made a comeback beginning in the early 1970s, only to decline again, along with the pill, after 1975. Meanwhile, sterilization appears to have experienced alternating waves of popularity, at first from 1973 through 1976 and then around 1980. The accuracy of the counts in Table 28 is questionable. Immerwahr (1981:21-22), after comparing the Family Health Bureau data on acceptors and WFS data, concluded that the Bureau underreported sterilizations and overreported acceptances of the pill and the IUD. The latter occurred, he conjectured, by counting subsequent acceptances by women who expelled IUD or discontinued the pill for a while. Thus, the relative use of sterilization is greater than that shown in the table. The

data may still be useful, however, as an indication of the ebb and flow of the use of these methods. This would be the case if the error in the acceptor counts were fairly constant over the years. Whether or not this is the case is not known.

Table 28 New Acceptors of the Pill, IUD, or Sterilization, Sri Lanka, 1966-1981

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Year	Pill	IUD	Sterilization
1966	1,000	10,000	3,000
1967	8,982	18,506	3,616
1968	16,014	20,615	1,011
1969	25,284	19,537	2,947
1970	26,889	15,799	4,971
1971	25,828	11,446	4,335
1972	32,300	18,599	9,576
1973	34,214	27,528	20,248
1974	35,924	29,693	42,234
1975	37,720	32,755	39,164
1976	25,597	27,030	35,588
1977	27,514	21,321	19,056
1978	21,146	23,085	21,949
1979	30,394	20,187	35,643
1980	29,296	19,232	112,926
1981	21,478	13,582	65,490

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Source: Namboodiri, et al., 1983:312.

It may be noted, however, that the sharp jump in sterilizations around 1980 shown in the table came after the increase in incentive payments to acceptors and in compensation to medical personnel performing the

procedure, which was part of the efforts of the government that took office in 1977 to give higher priority to family planning. (In accounting for the sharp fall in sterilization in the years 1977-78, Immerwahr (1981:37) noted that "the decline was apparently due to various administrative and political reasons rather than to a decrease in demand.") Similarly, the reported surge in sterilization in 1973 and 1974 may be related to the assistance obtained from the UNFPA beginning in 1973, part of which included provision for surgical facilities for sterilization (Immerwahr, 1981:14). Finally, the data in Table 28 are roughly consistent with the data in Tables 24 and 25 showing a decline in marital fertility during the 1960s (after 1963), an increase in the pace of this decline during the early 1970s, and then a levelling off during the late 1970s.

Data on acceptance, however, may be deceptive as an indication of use. They need to be supplemented, therefore, by data on use. Such data are available from the WFS (1975) and CPS (1982).

As shown in Table 29, the percent of wives 15-49 years old currently using contraception seems to have increased from 32 to 55 percent between 1975 and 1982, a gain of 23 percentage points. Thus, the prevalence of contraceptive use was apparently 72 percent greater ( $55/32$ ) in 1982 than in 1975. It must be noted, however, that the measures of current use were somewhat different in the CPS than in the WFS. "Current" use meant at the time of the survey in 1975. In 1982, however, it meant use during the month preceding the survey (Sri Lanka, 1983a:70). Furthermore, with respect to the use of specific methods, there were other differences in measurement which reduce the comparability of the results of the two surveys. Abstinence, for example, was listed as a specific method in 1975 but not in 1982. It was recorded as a method by the interviewer in 1982 only if the respondent

mentioned it without prompting. Such a procedure may well have been the reason for the lower reported use of abstinence in 1982 than in 1975 (Sri Lanka, 1983a:67). Thus, the results of the two surveys are not strictly comparable, obviating precise measurement of any change. The differences in the measures of current use are not so great, however, as to preclude taking the results as an indication of the direction and approximate magnitude of change. Thus, it seems reasonable to conclude that there was a very large increase in contraceptive use between 1975 and 1982 with the prevalence of use probably rising more than 50 percent.

Table 29 Percent of Currently Married Women Aged 15-49, Using Contraception, by Method, Sri Lanka, 1975 and 1982

Method	1975	1982	Change in Percentage Points
All methods	32.0	54.9	22.9
Pill	1.5	2.6	1.1
IUD	4.7	2.5	-2.2
Female Sterilization	9.2	17.0	7.8
Male Sterilization	0.7	3.7	3.0
Condom	2.3	3.2	0.9
Injections, Vaginal and Other Scientific Methods	0.4	1.4	1.0
Withdrawal	1.5	4.7	3.2
Rhythm	8.0	13.0	5.0
Other traditional methods	3.7	6.8	3.1

Source: Sri Lanka, 1983a: Table 6.5.

Turning to changes in the kind of method used, the first thing to note is that the percentage-point increase in the use of traditional methods (withdrawal, rhythm, and other traditional methods) was about as great as the increase in the use of the modern methods. Since the prevalence of use of traditional methods was lower in 1975 than that of modern methods (13.2 vs. 18.8 percent), the approximately equivalent percentage-point increase means that the gain was proportionately greater for traditional than for modern methods ( $24.5/13.2 = 86$  percent for traditional methods and  $30.4/18.8 = 62$  percent for modern methods).

The greatest increase was in female sterilization, the prevalence of which nearly doubled, increasing from 9.2 to 17.0 percent. The next largest gain was in the use of rhythm, from 8 to 13 percent. Other notable increases occurred in the use of male sterilization (3.0 percentage points, but the largest relative gain by far,  $3.7/0.7 = 529$  percent), withdrawal (from 1.5 to 4.7 percent), and "other traditional methods" (from 3.7 to 6.8 percent). The IUD was the only method (of those specifically identified in the table) which lost ground.

Female sterilization was the most prevalent method in both 1975 and 1982, with rhythm not far behind in popularity. Rhythm was the most popular method in 1982 among wives under age 25 and those with less than three children (Sri Lanka, 1983a:71). Traditional methods as a whole were more popular than all modern methods combined in 1982 among wives under age 25 and those with less than three living children (Sri Lanka, 1983a:76-77). One interpretation of these differentials is that married women in Sri Lanka tend to use traditional methods (especially rhythm) in the early years of their marriage, but as the number of their living children increases they switch to modern methods, with female sterilization predominating. WFS data presented

in Immerwahr (1981:19) support this interpretation. The age-specific figures for the two leading methods in 1982 were (Sri Lanka, 1983a:72):

Age	<u>Percent of married contraceptors</u>	
	<u>Female sterilization</u>	<u>Rhythm</u>
15-19	2.4	31.7
20-24	7.4	30.0
25-29	23.3	21.6
30-34	33.1	26.2
35-39	41.6	20.0
40-44	40.6	22.9
45-49	39.7	22.4

In addition to the shift from rhythm to sterilization as age advances, two other points deserve mention. One is that proportion of married contraceptors using rhythm did not vary much by age (the range is 20.0-31.7), with 20-25 percent of older married contraceptors using this method. The other point is that the percent of married contraceptors relying on female sterilization was significant (23 percent) as early as age 25-29 years.

There is more direct evidence of method shifting, and it reveals that method changes have been extensive (Sri Lanka, 1983a:75). Almost half (48 percent) of married contraceptors had used some other method in the past than the one currently used. Those currently using a modern method had changed somewhat more often than those currently using a traditional method (53 versus 42 percent). But the relative frequency of shifting was the same for those currently using modern methods as for those currently using traditional methods. In each case, 29 percent of the current users had switched from the other type of method.

The distinction between modern and traditional methods is significant because the latter are generally less effective. The difference in effectiveness, however, may vary by education. Rhythm, for example, may be practiced more carefully (and hence more effectively) by couples who are better educated. It is notable, therefore, that among married contraceptors in Sri Lanka in 1982 the percentage using traditional methods was positively associated with education, whereas this was not the case for the use of the modern methods, as the following data show (Sri Lanka, 1983a:77).

<u>Level of education</u>	<u>Modern methods</u>	<u>Traditional methods</u>
No schooling	27.7	16.3
Primary	31.5	20.9
Secondary or more	30.5	29.1
All wives	30.4	24.5

This relationship is particularly significant, since there is a high level of education in Sri Lanka. Of the 4,500 ever-married respondents in the CPS, 50 percent had at least some secondary education and another 35 percent had a primary school education (Sri Lanka, 1983a:24). Ninety three percent of the 4,500 ever-married women were currently married; hence, the education distribution of the latter group must be essentially the same as that for the former group.

WFS data provide some indication of the trend in the use of the most effective contraceptive methods prior to 1975. As one can see in Table 30, there seems to have been little use of such methods prior to 1965. The percentage that began to use these methods increased during the late 1960s. The pace of initial use continued to accelerate through the early 1970s. This trend of accelerating adoption of effective contraception was more pronounced

for contraceptive sterilization than for the other effective methods. The data presented in Table 29, comparing the WFS and the CPS results, indicate that the adoption of contraceptive sterilization accelerated between 1975 and 1982, but that the increases during this period in the prevalence of use of the pill and the condom were offset by the decline in the prevalence of use of the IUD. Table 28 suggests that the large increase in the prevalence of contraceptive sterilization between 1975 and 1982 was the net result of a sharp drop in the adoption of this method between 1975 and 1979, followed by a massive increase in its adoption in 1980 and 1981.

Table 30 Percentage Distribution of Women Who Were Ever-Married Ever-Users of Contraception According to Year of First Use, by Type of Method Sri Lanka, prior to 1976

Year of First Use	Contraceptively sterilized	Had not been contraceptively sterilized but had used, Pill, or IUD, or Condom
Before 1965	5	8
1965 - 1969	18	33
1970 - 1972	22	27
1973	14	9
1974	21	11
1975	20	12
Total	100	100
N	(587) <sup>a</sup>	(1,073)

a. Of these 587 women, 150 had used a modern method before sterilization. Three of the 150 had used an injectable. How many of these three had also ever used the pill, IUD, or the condom is not stated.

Source: Immerwahr, 1981: Tables 5a, 5b, and 6.

The indications of an accelerating adoption of modern means of contraception are consistent with the evidence of an accelerating fall in the TMFR and the TFR during the 1960s and early 1970s:

	<u>TFR</u>	<u>TMFR</u> (ages 20-49)
1963	5.04	6.23
1970	4.23	5.92
1974	3.36	4.93
1981	3.71	5.08
1970/63	.84	.95
1974/70	.79	.83
1981/74	1.10	1.03

They are not consistent, however, with the reversal of the fertility decline, which occurred after 1974. The large increase in contraceptive use between 1975 and 1982, which occurred at all ages (Sri Lanka 1983a, Tables 6.2 and 6.6), should have worked to depress marital fertility at all ages. As Table 25 shows, however, it appears that marital fertility fell between 1974 and 1981 only among wives under age 20 and over age 35. In examining the data on breastfeeding (above), a decline in its prevalence and duration up to 1975 was inferred. Furthermore, the possibility of a continued, and perhaps even an accelerated, decline was noted. Such a continued decline would, of course, have tended to offset the effect of the large increase in contraceptive use between 1975 and 1982. Unless, however, a decline in breastfeeding during the late 1970s and early 1980s (if one took place) occurred predominantly among women 20-34 years of age, it would not help to explain the observed differences in the changes in the ASMFR. As for the increase in the TFR after 1974, the increase in nuptiality during this period (see Table 23), along with the increase in the ASMFR at ages 25-34 and the absence of a decline at ages

20-24, are enough to account for it. (The ASMR are very high at ages 20-34, and the ASFR at these ages accounted for about 70-75 percent of the TFR during the late 1970s.)

#### 7. Abortion

Aside from information about its legal status, virtually no information about abortion in Sri Lanka was found. Abortion in Sri Lanka is legally permitted only to save a woman's life (Liskin, 1980:135). This, of course, does not preclude illegal abortions, and Fernando (1974:455) observes that "induced abortion is ... being resorted to for the prevention of births, most of which are presumably illegitimate." But he does not provide an estimate of its frequency.

#### D. Social and economic changes

Despite a respectable rate of growth of real income per capita (2.6 percent) during the 1960s and 1970s, Sri Lanka was still a low-income country in the early 1980s (Table 31). It was also preponderantly rural and agricultural. It had, nevertheless, reached a fairly high level of development in other important respects: education, the status of women, and mortality. By the 1970s, a very large majority of the population was literate; and, with enrollment in primary schools universal by about 1980, in a few more decades everyone will be literate. Meanwhile, the increases in literacy from the 1950s through the 1970s were swifter among women than men, reducing the sex differential. By around 1980, women's literacy rate was less than 10 percent lower than that of men. Similarly, women's life expectancy at birth advanced more rapidly than did men's, catching up by the 1960s and surpassing men's life expectancy thereafter. Around 1980, women's life

**Table 31 Selected Indicators of Social and Economic Development, Sri Lanka, 1950-80**

	Approximate Year			
	1950	1960	1970	1980
GNP per capita (U.S. \$) <sup>a</sup>	-	180	-	320
Percent urban	15	18	22	24
Percent of labor force in agriculture	-	56	-	54
Percent literate				
Females	54	63	71	-
Males	76	79	85	-
Ratio of Females to Males	.71	.80	.84	.91
Percent of age group enrolled				
Primary school	-	95	-	100
Secondary school	-	27	-	51
Higher education	-	1	-	3
Life expectancy at birth (years)				
Females	-	62	-	71
Males	-	62	-	67
Ratio of Females to Males	-	1.0	-	1.06
Infant Mortality Rate	-	71	-	32

a. Source gives \$320 for 1982 and an average annual growth rate of GNP per capita in constant average 1980-82 dollars between 1960 and 1982 of 2.6 percent, which implies a GNP per capita in constant dollars of about \$180 in 1960.

Note: See sources for specific years.

Sources: Sri Lanka, 1974  
    Urbanization, 1950 and 1970 - Table 4.2  
    Literacy, 1950, 1960, and 1970 - Table 3.19  
World Bank, 1984  
    GNP - Table 1  
    Urbanization, 1960 and 1980 - Table 22  
    Labor force - Table 21  
    Literacy, ratio F/M around 1980 - Table 5 (Population data supplement): reciprocal of M/F ratio.  
    Enrollment - Table 25  
    Life expectancy - Table 23  
    Infant mortality - Table 23

expectancy at birth was 6 percent greater than that of men. Finally, the infant mortality rate, a widely used index of socioeconomic conditions, declined greatly, from well over 100 infant deaths per thousand births during the 1940s (Sri Lanka, 1974:27) to 71 around 1960 and then to 32 around 1980. Although the latter figure is still considerably greater than the very low rates (under 10) in a number of high-income countries, it is the lowest rate among the low-income countries reported by the World Bank. In addition, there was a fairly rapid increase in the labor force participation rate of women 20-44 years old between 1963 and 1971, from 27 to 37 percent (Namboodiri et al. 1983:309).

The unusually high level of human development in a poor agrarian society has been the result of government welfare policies. Since 1945, education has been free to all, as was medical services until 1971, at which time a nominal charge was instituted (Namboodiri, et al., 1983:308). In 1981, the government allocated 13.7 percent of its expenditures to "housing and community amenities [or] social security and welfare" (World Bank, 1984: Table 26). The average percentage for all low-income countries included in the World Bank data was 5.0 percent including China and India and 6.1 percent excluding them. Sri Lanka's percentage is considerably greater than that for any other low-income country in the table. It is also greater than that of the preponderant majority of lower-middle-income countries shown in the table.

Other significant conditions are summarized by Namboodiri, et al. (1983:309) in these words: "Malthusian pressure on land is evident, particularly in the wet zone; unemployment is very high, even among the educated; ... the country is linked to others far and near through communications and transportation networks; Western ideas and life styles have influenced the island for centuries ...; direct and indirect taxes and other

income transfer policies have served to redistribute income; the nation-state serves as a source of insurance against penury, and as a source of support for the ill and the aged--roles traditionally filled by one's children, and finally, gender and class inequities have lessened over the years."

It appears, then, that the relatively high level of education in Sri Lanka, the great decline in mortality, the equalization of opportunity and condition, especially for women, social insurance, and the receptivity to aspects of Western culture may have been among the chief determinants of the decline in Sri Lanka's fertility, even in the face of little urbanization and industrialization.

In this context, the rise in the age at marriage, which has been identified as the main cause of the decline during the 1960s, has been explained as the result of growing birth cohorts getting more education and finding it difficult to obtain employment. "As a result of decreasing employment opportunities in the non-farm sector and a low rate of absorption in the farm sector, the age at marriage of males went up because families were presumably guided by the rule that they should not let a son get married before he is assured of a more or less permanent means of support" (Namboodiri et al. 1983:314). Young women as well as young men were staying in school longer, and the former were increasingly entering the labor force. Consequently, the dependency period of children lengthened. They were increasingly staying in school into their teens and they had to wait longer for a job after leaving school.

Not only did these social and economic trends induce the age of marriage to rise; they helped to motivate parents to want fewer children because the longer dependency of children increased their net cost. Thus, as family planning became increasingly available during the late 1960s and early

1970s, it was accepted. Consequently, the decline in marital fertility accelerated and became the main reason for the rapid decline of the TFR during the early 1970s.

But why did fertility stall subsequently? That is more difficult to ascertain. Part of the answer seems to be, however, that economic conditions improved greatly during the very late 1970s as a result of a major change in economic policy introduced by the government which came into power in 1977. As a result, domestic savings and foreign aid raised investment to a level during the period 1978-81 twice as high as that during the period 1970-77 (Namboodiri et al. 1983:12), and real per capita GNP grew at a rate almost three times as great as that during the preceding years of the 1970s and about twice as great as that of the 1960s (Namboodiri et al. 1983:302). Under such conditions marriage is more feasible. As Table 3 shows, during the period 1975-81 the percentage of women married increased, particularly among women under age 25, reversing the decline which had taken place during the preceding years. It would be helpful to have data on the percent married for 1978 so that the changes during the period 1978-81 can be ascertained and compared to those of the period 1975-77. Unfortunately, such data are not available. As noted above, however, marriage registration data suggest that about half of the rise in nuptiality during the period 1975-81 had occurred prior to 1978.

#### E. Summary

Despite having a low per capita income and being a predominantly agrarian society, a substantial fertility decline occurred in Sri Lanka between about the mid-1950s and the mid-1970s. A high level of social development (in terms of mortality, social welfare, education, and the status of women) and receptivity to aspects of Western culture seem to have supplied the incentive to reduce the number of children born. The fertility decline

was initially the result of a sharp fall in nuptiality. By the late 1960s, however, couples began to accept increasingly the modern methods of contraception which the national family planning program, established in the 1950s, was making available. As the use of these methods accelerated, the decline in marital fertility also accelerated. As a result, the pace of fertility decline was swifter during the early 1970s than it had been during the 1960s, and the drop in marital fertility displaced rising nuptiality as the main cause of fertility decline. Increases in the relative number of women of childbearing age, however, acted to retard somewhat the fall of the crude birth rate.

There is no evidence to indicate that abortion has been used to any appreciable extent. There is, however, an indication that some reduction in the long duration of breastfeeding practiced in Sri Lanka took place prior to 1975. Such a decline would tend to shorten birth intervals, enhancing fertility, but no estimate of the magnitude of this effect is available. Although a continuation of the decline of breastfeeding during the late 1970s could have occurred, the available indirect evidence is too meager to provide a reliable basis for judging what actually happened.

The reasons for the fertility stall of the late 1970s and very early 1980s are more difficult to identify. The national family planning program became considerably more effective between 1972 and 1982, and the prevalence of contraceptive use increased probably by more than 50 percent between 1975 and 1982. Much of this increase, however, was in the use of traditional methods of contraception, which are generally less effective than the modern methods. Nevertheless, it is less risky to use traditional methods than no method at all. The large increase, therefore, in the use of both modern and traditional methods between 1975 and 1982 should have tended to depress the

age-specific marital fertility rates more than the available data indicate they actually fell. The available data may contain errors, or other changes (such as a decline in the duration of breastfeeding) may have offset to some extent the fertility depressing effect of the increased use of contraception.

The evidence is clearer, however, with respect to nuptiality. There was a reversal during the period 1975-81 of the long-run decline in the percentage of women married, with the increase especially pronounced among women under age 25. Perhaps half of this rise in nuptiality began before 1978. The sharp improvement in economic conditions which occurred during the period 1978-81 very likely strengthened the trend of increasing nuptiality.

### CONCLUSION

In this study of rapid fertility decline in Costa Rica, Korea, and Sri Lanka, four stalls in the decline have been identified, two in Korea, and one in each of the other two countries. Three of the stalls appear to be a levelling off of the TFR and one a marked deceleration in its rate of decline. There is reason to believe that stalls have occurred in other countries also. Hence, though it is not clear just how widespread the phenomenon is, it has been occurring often enough to warrant study of its determinants and consequences. The focus of this study has been on its determinants, but a few words may be said about its consequences.

The most obvious effect is on the birth rate and, via that effect, on the age structure and the rate of natural increase. In this connection, a major question is how long the stalls last. Of the four stalls observed in this study, only one had ended as of the period 1980-82, the latest years for which data were available at the time this study was done. That was in Korea during the six-year period 1967-1972 inclusive, when the TFR remained almost stationary in the range 4.2-4.4. The other three stalls began during the late 1970s and had not ended as of 1980-82, so their duration is unknown as yet. But they had lasted at least five years (as of 1980) in Costa Rica, at least seven years (as of 1982) in Korea, and at least eight years (as of 1981) in Sri Lanka. A duration of at least five years was one of the criteria used in defining a stall in this study, but periods significantly longer than that have obviously occurred, and some of the durations may turn out to be at least ten years.

This is not the appropriate place to specify the ramifications of a stall's impact on the age structure and the rate of natural increase. But a brief indication of just one of its implications may be helpful in indicating its significance. Population projections usually assume a smooth change (often, a decline) in fertility (as well as the other components) until a major turning point (a reversal or a levelling off) occurs. To the extent that stalls occur, such an assumption will be incorrect, and the magnitude of the error will be determined by (1) the gap between the projection's assumed rate of change and that which actually occurs during the stall (which may be positive or negative, but at a much slower rate than previously, as well as zero) and (2) the duration of the stall. It follows that projections assuming a smooth decline in fertility will underestimate i.a. the rate of population growth, the size of the population and the proportion of the young in the population in the countries experiencing a stall. And the projection based on an assumption of a rapid decline in fertility will be particularly misleading, especially if the stall lasts for a period closer to ten than to five years. Taking stalls into account will require making difficult judgments about their timing and duration, but given their existence, a projection based on a fertility decline assumed to be interrupted by a stall needs to be added to the set of population projections for high-fertility countries.

Turning to determinants, the most striking findings are that the explanations of the stalls are partial and that they differ from one country to the next. In Costa Rica, the explanation seems to be mainly that marital fertility and contraceptive use levelled off, apparently as a result of (1) a convergence between desired and actual fertility and (2) a weakening of the family planning program, as the initial enthusiasm and political support waned.

In Korea, at least some of the reasons for the near levelling off of the TFR during the late 1960s seem to be evident. But the explanation for the acceleration after 1975 is not. During the earlier period, an increase in marriage among women 30-49 years old, as well as an increase in marital fertility of those under age 30, offset declines in marriage among women 15-29 years old and in the marital fertility of women aged 30-49. The rise in the marital fertility of younger women is accounted for by a sharp decrease in the first three birth intervals, resulting from increases in premaritally conceived first births (associated with a shift from arranged to romantic marriages), declines in the duration of breastfeeding, and an apparently growing desire to terminate childbearing early. The increase in contraceptive use decelerated markedly during the late 1960s.

During the late 1970s in Korea, the marital fertility of women 25-29 years old increased a bit, reversing the moderate decline of the early 1970s. Among wives 30-34 years old, fertility continued to fall during the late 1970s, but at less than half the rate of the early 1970s. By the late 1970s, childbearing had become so concentrated that almost half of the total fertility rate was accounted for by the birth rate of women aged 25-29, and about two-thirds by women aged 25-34. The increase in contraceptive use decelerated during the late 1970s and early 1980s (especially the latter period), after the acceleration of the early 1970s. But the reasons for these changes have not been identified.

The explanation for the fertility stall during the late 1970s in Sri Lanka is also quite limited. There was a large increase in contraceptive use between 1975 and 1982. At least some of the fertility-depressing effect of this increase was presumably offset by an increase in marriage, which seems to have begun prior to 1978, when economic conditions improved considerably,

apparently strengthening the rising trend of marriage. There may have been a reduction also in the long duration of breastfeeding which has been practiced in Sri Lanka (thereby tending to increase fertility), but the evidence is too meager for one to be confident that such a decline actually occurred.

Because the explanation of the stall seems to be simpler and clearer in the case of Costa Rica than of Korea or Sri Lanka, it is easier to identify in Costa Rica than in the other two countries what may be needed for the stall to end. The key factor in Costa Rica appears to be the equilibrium of actual and desired family size which the available evidence indicates took place around the middle of the 1970s. Actual fertility could fall below desired family size, but it is more likely that a further decline in fertility awaits a decline in desired size. The available evidence about the determinants of desired size in Costa Rica is very meager. What one finds in the literature are theoretically based conjectures about the effects of social and economic development. More evidence concerning the specific mechanisms linking development to changes in desired size would be helpful in accounting for the past trend in fertility and for projecting its future course. Short of that, however, one may venture to speculate along the lines found in the literature. In that view, further substantial economic growth may be critical. For such growth would permit continued expansion of education and social welfare. Some of the consequences of such an expansion would be increases in the aspirations for higher social and economic status, the labor force participation of women, the dependency (and hence cost) of children (as schooling lengthens), and the care and financial support provided the elderly via a combination of personal savings, better health, communal care facilities and services, and public and private pension programs.

If desired size were to fall substantially below the level of the late 1970s, than the status of the family planning program would be relevant. What would renew the enthusiasm and political support that enabled the NFPP to expand so vigorously for a number of years after its establishment in 1968 before peaking out and then declining during the late 1970s? One possibility is that with the hypothesized substantial decline in desired family size, the resultant gap between actual and desired size would stimulate a considerable increase in demand for family planning services and supplies, which i.a. could have an effect on the willingness of the leaders to support the NFPP more vigorously than they seem to have done during the late 1970s. The leaders also may be stimulated to take such action by a renewed sense of concern about the deleterious effects of the country's continued high rate of population growth. Though the birth rate dropped a lot between 1960 and 1975, some of the decline was offset by a continued fall in the death rate. Furthermore, the rate of population growth was so high in 1960 that, even with a substantial decline during the next 15 years, the rate was still high in 1975.

Turning to Korea and Sri Lanka, since the causes of their stalls seem to be more complex and less explicable than those in Costa Rica, one can do little more than offer a few pertinent comments and queries. In both countries, large declines in the percent married have played an important part in bringing about the fall in fertility, and reversals in the decline in marriage have contributed to the stalls. In both societies, celibacy is rare, so the significant variable is the age at marriage. Given the large increase in age at marriage that has already occurred, it seems unlikely that a further significant rise will take place. But what about declines in age at marriage? They have occurred, but apparently only temporarily or with

relatively little effect. Is the future prospect further fluctuation in age at marriage around the current level, or a substantial decline?

There is evidence that breastfeeding has been declining in both countries. But more detailed and precise measures of the extent and pace of the declines, as well as their impact on fertility, are needed. The rapid increases in contraceptive use in both countries, however, may reach such high levels (70 percent or more) in the near future as to reduce greatly the potential impact of further declines in breastfeeding.

In Korea, but not in Sri Lanka, there is a marked preference for sons. There is disagreement, however, about the extent to which son preference is an obstacle to further fertility decline. With a TFR well below three in the early 1980s (hence, not far above the replacement level of fertility), the resolution of this issue would be particularly helpful in judging the prospects for and pace of a further decline in fertility.

In Sri Lanka, on the other hand, an impressively large proportion of contraceptors continue to use rhythm and other traditional methods. About half of the large increase in contraceptive use from 1976 to 1982 resulted from an increase in the use of these methods. What has been the effectiveness of these methods in preventing pregnancies (and, given the virtual absence of induced abortion, in preventing births) in Sri Lanka, in comparison with the modern methods (pill, IUD, tubal ligation, etc.)? Also, why have so many Sri Lankan women continued to adopt/use the traditional methods? Answers to these questions would better enable us to judge the likely future mix of methods and the extent to which such a mix would enable women in Sri Lanka to control their fertility.

It would be risky to draw firm conclusions about the reasons for the stalls in fertility declines on the basis of this study in only three

countries, even if the explanations for the stalls were more complete and better documented than is the case in this study. Nevertheless, the diversity of the apparent reasons from one country to the other in this study suggests that there may be few, if any, key factors, and that the means to prevent or overcome stalls will have to be developed on the basis of as complete an understanding of the system of fertility determinants in each country.

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